Final Report

Experiments and Causality

Colby Carter, Abhishek Agarwal, Tiffany Jaya

April 16, 2018

Load the libraries

```r
library(data.table) # fread
library(dplyr)
library(geonames)
library(lmtest) # coeftest
library(lubridate) # time conversion
library(sandwich) # vcovHC
library(RJSONIO)
```

Helper functions

```r
convert_fctr_to_boolean <- function(col) {
  return(as.numeric(as.logical(col)))
}

convert_fctr_to_datetime <- function(col) {
  return(as.POSIXct(col, format="%Y-%m-%d %H:%M:%S"))
}

convert_fctr_to_numeric <- function(col) {
  return(as.numeric(levels(col)[col]))
}

convert_fctr_to_str <- function(col) {
  return(as.character(col))
}
```

Load the dataset

```r
# pilot study
d <- read.csv(file = "./W241 Colby Carter, Tiffany Jaya, Abhishek Agarwal_April 5, 2018_00.27.csv",
              header = TRUE,
              sep = ",")

# actual study
d <- read.csv(file = "./W241 Colby Carter, Tiffany Jaya, Abhishek Agarwal_April 12, 2018_09.41.csv",
              header = TRUE,
              sep = ",")
```

Clean up the dataset

WARNING: DO NOT RERUN THIS SECTION TWICE!

```r
# rename columns to be more descriptive
setnames(d,
         old = c("Q1.1",
                 "Q2.2_1",
                 "Q2.3_1",
                 "Q2.5_1",
                 "Q2.7_1",
                 "Q3.1_1",
                 "Q3.3_1",
                 "Q3.5_1",
                 "Q3.7_1",
                 "Q4.1",
                 "Q4.2",
                 "Q4.3",
                 "Q4.4",
                 "Q4.5",
                 "Q4.6",
                 "Q4.7",
                 "Q4.8",
                 "Q4.9",
                 "Q4.10",
                 "Q4.11",
                 "Q4.12",
                 "Q4.13",
                 "Q4.14",
                 "Q4.15",
                 "Q4.16",
                 "Q2.1_First.Click",
                 "Q2.1_Last.Click",
                 "Q2.1_Page.Submit",
                 "Q2.1_Click.Count",
                 "Q2.4_First.Click",
                 "Q2.4_Last.Click",
                 "Q2.4_Page.Submit",
                 "Q2.4_Click.Count",
                 "Q2.6_First.Click",
                 "Q2.6_Last.Click",
                 "Q2.6_Page.Submit",
                 "Q2.6_Click.Count",
                 "Q2.8_First.Click",
                 "Q2.8_Last.Click",
                 "Q2.8_Page.Submit",
                 "Q2.8_Click.Count",
                 "Q3.2_First.Click",
                 "Q3.2_Last.Click",
                 "Q3.2_Page.Submit",
                 "Q3.2_Click.Count",
                 "Q3.4_First.Click",
                 "Q3.4_Last.Click",
                 "Q3.4_Page.Submit",
```

```r
            "Q3.4_Click.Count",
            "Q3.6_First.Click",
            "Q3.6_Last.Click",
            "Q3.6_Page.Submit",
            "Q3.6_Click.Count",
            "Q3.8_First.Click",
            "Q3.8_Last.Click",
            "Q3.8_Page.Submit",
            "Q3.8_Click.Count"),
    new = c("consent",
            "control_employment",
            "control_education", # baseline
            "control_retirement",
            "control_cybersecurity",
            "treatment_employment",
            "treatment_education", # baseline,
            "treatment_retirement",
            "treatment_cybersecurity",
            "gender",
            "age",
            "highest_education",
            "employment_status",
            "marital_status",
            "zip_code",
            "community", # rural, urban, suburban
            "can_vote",
            "political_party",
            "ethnicity",
            "income",
            "have_kids",
            "internet_from_mobile",
            "internet_from_home",
            "internet_from_work",
            "who_pays_internet",
            "control_employment_First.Click",
            "control_employment_Last.Click",
            "control_employment_Page.Submit",
            "control_employment_Click.Count",
            "control_education_First.Click",
            "control_education_Last.Click",
            "control_education_Page.Submit",
            "control_education_Click.Count",
            "control_retirement_First.Click",
            "control_retirement_Last.Click",
            "control_retirement_Page.Submit",
            "control_retirement_Click.Count",
            "control_cybersecurity_First.Click",
            "control_cybersecurity_Last.Click",
            "control_cybersecurity_Page.Submit",
            "control_cybersecurity_Click.Count",
            "treatment_employment_First.Click",
            "treatment_employment_Last.Click",
            "treatment_employment_Page.Submit",
```

```r
                    "treatment_employment_Click.Count",
                    "treatment_education_First.Click",
                    "treatment_education_Last.Click",
                    "treatment_education_Page.Submit",
                    "treatment_education_Click.Count",
                    "treatment_retirement_First.Click",
                    "treatment_retirement_Last.Click",
                    "treatment_retirement_Page.Submit",
                    "treatment_retirement_Click.Count",
                    "treatment_cybersecurity_First.Click",
                    "treatment_cybersecurity_Last.Click",
                    "treatment_cybersecurity_Page.Submit",
                    "treatment_cybersecurity_Click.Count"))
```

```r
# 1. remove the first two rows
d <- tail(d, -2)
# 2. remove rownames to avoid confusion (because it is not the subject's id)
rownames(d) <- NULL
# 3. safely convert columns of type factors to their respective types
# 3a. factor -> datetime
cols <- c("StartDate", "EndDate", "RecordedDate")
d[,cols] <- lapply(d[,cols], convert_fctr_to_datetime)
```

```
## Warning in strptime(x, format, tz = tz): unknown timezone 'zone/tz/2018c.
## 1.0/zoneinfo/America/Los_Angeles'
```

```r
# 3b. factor -> logical/boolean
cols <- c("Finished")
d[,cols] <- lapply(d[,cols], convert_fctr_to_boolean)
```

```
## Warning in `[<-.data.frame`(`*tmp*`, , cols, value = list(1, 1, 1, 1, 1, :
## provided 638 variables to replace 1 variables
```

```r
d$consent <- ifelse(d$consent == "Yes", 1, 0)
d$can_vote <- ifelse(d$can_vote == "Yes", 1, 0)
d$have_kids <- ifelse(d$have_kids == "Yes", 1, 0)
# 3c. factor -> numeric
cols <- c("Progress",
          "Duration..in.seconds.",
          "LocationLatitude",
          "LocationLongitude",
          "control_employment",
          "control_education",
          "control_retirement",
          "control_cybersecurity",
          "treatment_employment",
          "treatment_education",
          "treatment_retirement",
          "treatment_cybersecurity",
          "zip_code",
          "control_employment_First.Click",
          "control_employment_Last.Click",
          "control_employment_Page.Submit",
          "control_employment_Click.Count",
          "control_education_First.Click",
```

```
        "control_education_Last.Click",
        "control_education_Page.Submit",
        "control_education_Click.Count",
        "control_retirement_First.Click",
        "control_retirement_Last.Click",
        "control_retirement_Page.Submit",
        "control_retirement_Click.Count",
        "control_cybersecurity_First.Click",
        "control_cybersecurity_Last.Click",
        "control_cybersecurity_Page.Submit",
        "control_cybersecurity_Click.Count",
        "treatment_employment_First.Click",
        "treatment_employment_Last.Click",
        "treatment_employment_Page.Submit",
        "treatment_employment_Click.Count",
        "treatment_education_First.Click",
        "treatment_education_Last.Click",
        "treatment_education_Page.Submit",
        "treatment_education_Click.Count",
        "treatment_retirement_First.Click",
        "treatment_retirement_Last.Click",
        "treatment_retirement_Page.Submit",
        "treatment_retirement_Click.Count",
        "treatment_cybersecurity_First.Click",
        "treatment_cybersecurity_Last.Click",
        "treatment_cybersecurity_Page.Submit",
        "treatment_cybersecurity_Click.Count"
        )
d[,cols] <- lapply(d[,cols], convert_fctr_to_numeric)
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
# 3d. factor -> str
cols <- c("IPAddress", "ResponseId", "UserLanguage", "highest_education")
d[,cols] <- lapply(d[,cols], convert_fctr_to_str)
```

Add additional information into the dataset

```
# get country information based on latlong
country_names <- mapply(
  function(lat, long) {
    suppressWarnings(try(GNcountryCode(lat, long)$countryName, silent = TRUE))
  }, d$LocationLatitude, d$LocationLongitude)
d$country <- country_names
```

List all the columns

```
colnames(d)
```

```
##  [1] "StartDate"
##  [2] "EndDate"
##  [3] "Status"
```

```
##  [4] "IPAddress"
##  [5] "Progress"
##  [6] "Duration..in.seconds."
##  [7] "Finished"
##  [8] "RecordedDate"
##  [9] "ResponseId"
## [10] "RecipientLastName"
## [11] "RecipientFirstName"
## [12] "RecipientEmail"
## [13] "ExternalReference"
## [14] "LocationLatitude"
## [15] "LocationLongitude"
## [16] "DistributionChannel"
## [17] "UserLanguage"
## [18] "consent"
## [19] "control_employment_First.Click"
## [20] "control_employment_Last.Click"
## [21] "control_employment_Page.Submit"
## [22] "control_employment_Click.Count"
## [23] "control_employment"
## [24] "control_education_First.Click"
## [25] "control_education_Last.Click"
## [26] "control_education_Page.Submit"
## [27] "control_education_Click.Count"
## [28] "control_education"
## [29] "control_retirement_First.Click"
## [30] "control_retirement_Last.Click"
## [31] "control_retirement_Page.Submit"
## [32] "control_retirement_Click.Count"
## [33] "control_retirement"
## [34] "control_cybersecurity_First.Click"
## [35] "control_cybersecurity_Last.Click"
## [36] "control_cybersecurity_Page.Submit"
## [37] "control_cybersecurity_Click.Count"
## [38] "control_cybersecurity"
## [39] "treatment_employment_First.Click"
## [40] "treatment_employment_Last.Click"
## [41] "treatment_employment_Page.Submit"
## [42] "treatment_employment_Click.Count"
## [43] "treatment_employment"
## [44] "treatment_education_First.Click"
## [45] "treatment_education_Last.Click"
## [46] "treatment_education_Page.Submit"
## [47] "treatment_education_Click.Count"
## [48] "treatment_education"
## [49] "treatment_retirement_First.Click"
## [50] "treatment_retirement_Last.Click"
## [51] "treatment_retirement_Page.Submit"
## [52] "treatment_retirement_Click.Count"
## [53] "treatment_retirement"
## [54] "treatment_cybersecurity_First.Click"
## [55] "treatment_cybersecurity_Last.Click"
## [56] "treatment_cybersecurity_Page.Submit"
## [57] "treatment_cybersecurity_Click.Count"
```

```
## [58] "treatment_cybersecurity"
## [59] "gender"
## [60] "age"
## [61] "highest_education"
## [62] "employment_status"
## [63] "marital_status"
## [64] "zip_code"
## [65] "community"
## [66] "can_vote"
## [67] "political_party"
## [68] "ethnicity"
## [69] "income"
## [70] "have_kids"
## [71] "internet_from_mobile"
## [72] "internet_from_home"
## [73] "internet_from_work"
## [74] "who_pays_internet"
## [75] "mTurkCode"
## [76] "Q6...Topics"
## [77] "country"
```

Analysis

data: contains the original dataset

```
# save a copy of the original dataset
data <- d
```

Filter

d: contains the dataset after we filtered out for the following:

1. subjects who did not finish the survey 100%
2. subjects who consented to take the survey

```
# filter for subjects who consented to take the survey
d <- d[which(d$consent == 1),]
```

3. subjects who are from USA

```
# filter for subjects who are from USA
d <- d %>% filter(., country == "United States")
```

4. subjects who took the survey once

```
# filter out subjects who took the survey more than once
subjects.repeater <- d %>% group_by(IPAddress) %>% summarize(freq = sum(n())) %>% filter(freq > 1)
d <- d %>% filter(!(IPAddress %in% subjects.repeater$IPAddress))
```

How many took the survey?

```
# how many subjects take the survey?
nrow(data)
```

```
## [1] 638
```

7

638 subjects take the survey.

Verify that ResponseId is unique

```
# is ResponseId unique?
# if yes, use ResponseId as a unique id
freq_responseid <- data %>% group_by(ResponseId) %>% summarize(freq = sum(n()))
sum(freq_responseid$freq > 1) == 0
```
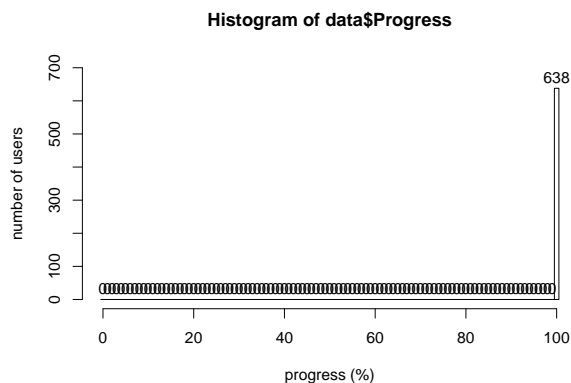
```
## [1] TRUE
```

ResponseId is unique.

Verify that all the subjects completed the survey

```
# how many subjects did not finish the survey?
sum(!data$Finished)
```

```
## [1] 0
```

```
# plot the progress of each subject
hist(data$Progress,
     xlab = "progress (%)",
     ylab = "number of users",
     breaks = -0.5:100.5,
     ylim = c(0, 700),
     labels = TRUE)
```


Histogram of data$Progress

All of the subjects completed the survey.

Verify that all subjects completed the survey in reasonable time (greater than 2 minutes)

```
# how long does it take the subjects who consented to finish the survey in minutes?
subjects.consent <- data[which(data$consent == 1),]
summary(subjects.consent$Duration..in.seconds./60)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   3.417   4.383   5.050   5.613   6.275  20.700
```

The following checks are unnecessary:

```r
# list all the subjects who take less than 2 minutes to finish the survey
subjects.less_2_min <- data[which(data$Duration..in.seconds./60 < 2),]
nrow(subjects.less_2_min)
```

```
## [1] 8
```

```r
# list all subjects who did not consent
subjects.no_consent <- data[which(data$consent == 0),]
nrow(subjects.no_consent)
```

```
## [1] 10
```

```r
# verify that the subjects who did not consent
# match the subjects who took the survey in less than 2 minutes
all(subjects.less_2_min$ResponseId %in% subjects.no_consent$ResponseId)
```

```
## [1] TRUE
```

Verify that all subjects have English set as their language

```r
# list all languages not in English
data[which(data$UserLanguage != "EN"),]$UserLanguage
```

```
## [1] ""
```

Verify that all subjects are from United States

```r
# how many subjects are from United States?
data %>% filter(., country == "United States") %>% count(.)
```

```
## # A tibble: 1 x 1
##       n
##   <int>
## 1   580
```

```r
# how many subjects are from outside the United States?
data %>% filter(., country != "United States") %>% count(.)
```

```
## # A tibble: 1 x 1
##       n
##   <int>
## 1    58
```

Out of 638 subjects, 580 subjects are from the United States and 58 are from outside the United States.

Verify that subjects only took the survey once

```r
subjects.repeater
```

```
## # A tibble: 4 x 2
##   IPAddress        freq
##   <chr>           <int>
## 1 170.185.202.19      2
```

```
## 2 24.46.117.154        3
## 3 50.88.107.50         3
## 4 67.183.210.112       6
```

All devices connected to the same router will share the same external IP address.

```
d %>% filter(IPAddress == "170.185.202.19")
```

```
##  [1] StartDate
##  [2] EndDate
##  [3] Status
##  [4] IPAddress
##  [5] Progress
##  [6] Duration..in.seconds.
##  [7] Finished
##  [8] RecordedDate
##  [9] ResponseId
## [10] RecipientLastName
## [11] RecipientFirstName
## [12] RecipientEmail
## [13] ExternalReference
## [14] LocationLatitude
## [15] LocationLongitude
## [16] DistributionChannel
## [17] UserLanguage
## [18] consent
## [19] control_employment_First.Click
## [20] control_employment_Last.Click
## [21] control_employment_Page.Submit
## [22] control_employment_Click.Count
## [23] control_employment
## [24] control_education_First.Click
## [25] control_education_Last.Click
## [26] control_education_Page.Submit
## [27] control_education_Click.Count
## [28] control_education
## [29] control_retirement_First.Click
## [30] control_retirement_Last.Click
## [31] control_retirement_Page.Submit
## [32] control_retirement_Click.Count
## [33] control_retirement
## [34] control_cybersecurity_First.Click
## [35] control_cybersecurity_Last.Click
## [36] control_cybersecurity_Page.Submit
## [37] control_cybersecurity_Click.Count
## [38] control_cybersecurity
## [39] treatment_employment_First.Click
## [40] treatment_employment_Last.Click
## [41] treatment_employment_Page.Submit
## [42] treatment_employment_Click.Count
## [43] treatment_employment
## [44] treatment_education_First.Click
## [45] treatment_education_Last.Click
## [46] treatment_education_Page.Submit
## [47] treatment_education_Click.Count
```

```
## [48] treatment_education
## [49] treatment_retirement_First.Click
## [50] treatment_retirement_Last.Click
## [51] treatment_retirement_Page.Submit
## [52] treatment_retirement_Click.Count
## [53] treatment_retirement
## [54] treatment_cybersecurity_First.Click
## [55] treatment_cybersecurity_Last.Click
## [56] treatment_cybersecurity_Page.Submit
## [57] treatment_cybersecurity_Click.Count
## [58] treatment_cybersecurity
## [59] gender
## [60] age
## [61] highest_education
## [62] employment_status
## [63] marital_status
## [64] zip_code
## [65] community
## [66] can_vote
## [67] political_party
## [68] ethnicity
## [69] income
## [70] have_kids
## [71] internet_from_mobile
## [72] internet_from_home
## [73] internet_from_work
## [74] who_pays_internet
## [75] mTurkCode
## [76] Q6...Topics
## [77] country
## <0 rows> (or 0-length row.names)
```

It might be that the two women who took the survey are roommates, but since we have no way to confirm, it is better not to use this dataset in the study.

```r
d %>% filter(IPAddress == "24.46.117.154")
```

```
##  [1] StartDate
##  [2] EndDate
##  [3] Status
##  [4] IPAddress
##  [5] Progress
##  [6] Duration..in.seconds.
##  [7] Finished
##  [8] RecordedDate
##  [9] ResponseId
## [10] RecipientLastName
## [11] RecipientFirstName
## [12] RecipientEmail
## [13] ExternalReference
## [14] LocationLatitude
## [15] LocationLongitude
## [16] DistributionChannel
## [17] UserLanguage
## [18] consent
```

```
## [19] control_employment_First.Click
## [20] control_employment_Last.Click
## [21] control_employment_Page.Submit
## [22] control_employment_Click.Count
## [23] control_employment
## [24] control_education_First.Click
## [25] control_education_Last.Click
## [26] control_education_Page.Submit
## [27] control_education_Click.Count
## [28] control_education
## [29] control_retirement_First.Click
## [30] control_retirement_Last.Click
## [31] control_retirement_Page.Submit
## [32] control_retirement_Click.Count
## [33] control_retirement
## [34] control_cybersecurity_First.Click
## [35] control_cybersecurity_Last.Click
## [36] control_cybersecurity_Page.Submit
## [37] control_cybersecurity_Click.Count
## [38] control_cybersecurity
## [39] treatment_employment_First.Click
## [40] treatment_employment_Last.Click
## [41] treatment_employment_Page.Submit
## [42] treatment_employment_Click.Count
## [43] treatment_employment
## [44] treatment_education_First.Click
## [45] treatment_education_Last.Click
## [46] treatment_education_Page.Submit
## [47] treatment_education_Click.Count
## [48] treatment_education
## [49] treatment_retirement_First.Click
## [50] treatment_retirement_Last.Click
## [51] treatment_retirement_Page.Submit
## [52] treatment_retirement_Click.Count
## [53] treatment_retirement
## [54] treatment_cybersecurity_First.Click
## [55] treatment_cybersecurity_Last.Click
## [56] treatment_cybersecurity_Page.Submit
## [57] treatment_cybersecurity_Click.Count
## [58] treatment_cybersecurity
## [59] gender
## [60] age
## [61] highest_education
## [62] employment_status
## [63] marital_status
## [64] zip_code
## [65] community
## [66] can_vote
## [67] political_party
## [68] ethnicity
## [69] income
## [70] have_kids
## [71] internet_from_mobile
## [72] internet_from_home
```

```
## [73] internet_from_work
## [74] who_pays_internet
## [75] mTurkCode
## [76] Q6...Topics
## [77] country
## <0 rows> (or 0-length row.names)
```

It's simply not possible that different people with different zip codes to have the same IP address. The reliability of this data is questionable. It might be possible that friends come over to take the same survey, but since we have no way to confirm, it is better not to use this dataset in the study.

```
d %>% filter(IPAddress == "50.88.107.50")
```

```
##  [1] StartDate
##  [2] EndDate
##  [3] Status
##  [4] IPAddress
##  [5] Progress
##  [6] Duration..in.seconds.
##  [7] Finished
##  [8] RecordedDate
##  [9] ResponseId
## [10] RecipientLastName
## [11] RecipientFirstName
## [12] RecipientEmail
## [13] ExternalReference
## [14] LocationLatitude
## [15] LocationLongitude
## [16] DistributionChannel
## [17] UserLanguage
## [18] consent
## [19] control_employment_First.Click
## [20] control_employment_Last.Click
## [21] control_employment_Page.Submit
## [22] control_employment_Click.Count
## [23] control_employment
## [24] control_education_First.Click
## [25] control_education_Last.Click
## [26] control_education_Page.Submit
## [27] control_education_Click.Count
## [28] control_education
## [29] control_retirement_First.Click
## [30] control_retirement_Last.Click
## [31] control_retirement_Page.Submit
## [32] control_retirement_Click.Count
## [33] control_retirement
## [34] control_cybersecurity_First.Click
## [35] control_cybersecurity_Last.Click
## [36] control_cybersecurity_Page.Submit
## [37] control_cybersecurity_Click.Count
## [38] control_cybersecurity
## [39] treatment_employment_First.Click
## [40] treatment_employment_Last.Click
## [41] treatment_employment_Page.Submit
## [42] treatment_employment_Click.Count
```

```
## [43] treatment_employment
## [44] treatment_education_First.Click
## [45] treatment_education_Last.Click
## [46] treatment_education_Page.Submit
## [47] treatment_education_Click.Count
## [48] treatment_education
## [49] treatment_retirement_First.Click
## [50] treatment_retirement_Last.Click
## [51] treatment_retirement_Page.Submit
## [52] treatment_retirement_Click.Count
## [53] treatment_retirement
## [54] treatment_cybersecurity_First.Click
## [55] treatment_cybersecurity_Last.Click
## [56] treatment_cybersecurity_Page.Submit
## [57] treatment_cybersecurity_Click.Count
## [58] treatment_cybersecurity
## [59] gender
## [60] age
## [61] highest_education
## [62] employment_status
## [63] marital_status
## [64] zip_code
## [65] community
## [66] can_vote
## [67] political_party
## [68] ethnicity
## [69] income
## [70] have_kids
## [71] internet_from_mobile
## [72] internet_from_home
## [73] internet_from_work
## [74] who_pays_internet
## [75] mTurkCode
## [76] Q6...Topics
## [77] country
## <0 rows> (or 0-length row.names)
```

With the same reasoning as above, it is better not to use this dataset.

```r
d %>% filter(IPAddress == "67.183.210.112")
```

```
##  [1] StartDate
##  [2] EndDate
##  [3] Status
##  [4] IPAddress
##  [5] Progress
##  [6] Duration..in.seconds.
##  [7] Finished
##  [8] RecordedDate
##  [9] ResponseId
## [10] RecipientLastName
## [11] RecipientFirstName
## [12] RecipientEmail
## [13] ExternalReference
## [14] LocationLatitude
```

```
## [15] LocationLongitude
## [16] DistributionChannel
## [17] UserLanguage
## [18] consent
## [19] control_employment_First.Click
## [20] control_employment_Last.Click
## [21] control_employment_Page.Submit
## [22] control_employment_Click.Count
## [23] control_employment
## [24] control_education_First.Click
## [25] control_education_Last.Click
## [26] control_education_Page.Submit
## [27] control_education_Click.Count
## [28] control_education
## [29] control_retirement_First.Click
## [30] control_retirement_Last.Click
## [31] control_retirement_Page.Submit
## [32] control_retirement_Click.Count
## [33] control_retirement
## [34] control_cybersecurity_First.Click
## [35] control_cybersecurity_Last.Click
## [36] control_cybersecurity_Page.Submit
## [37] control_cybersecurity_Click.Count
## [38] control_cybersecurity
## [39] treatment_employment_First.Click
## [40] treatment_employment_Last.Click
## [41] treatment_employment_Page.Submit
## [42] treatment_employment_Click.Count
## [43] treatment_employment
## [44] treatment_education_First.Click
## [45] treatment_education_Last.Click
## [46] treatment_education_Page.Submit
## [47] treatment_education_Click.Count
## [48] treatment_education
## [49] treatment_retirement_First.Click
## [50] treatment_retirement_Last.Click
## [51] treatment_retirement_Page.Submit
## [52] treatment_retirement_Click.Count
## [53] treatment_retirement
## [54] treatment_cybersecurity_First.Click
## [55] treatment_cybersecurity_Last.Click
## [56] treatment_cybersecurity_Page.Submit
## [57] treatment_cybersecurity_Click.Count
## [58] treatment_cybersecurity
## [59] gender
## [60] age
## [61] highest_education
## [62] employment_status
## [63] marital_status
## [64] zip_code
## [65] community
## [66] can_vote
## [67] political_party
## [68] ethnicity
```

```
## [69] income
## [70] have_kids
## [71] internet_from_mobile
## [72] internet_from_home
## [73] internet_from_work
## [74] who_pays_internet
## [75] mTurkCode
## [76] Q6...Topics
## [77] country
## <0 rows> (or 0-length row.names)
```

With the same reasoning as above, it is better not to use this dataset.

Verify that subjects answer all the questions

```
# check if subjects in control answer all questions
d %>%
  select(control_employment, control_education, control_retirement, control_cybersecurity) %>%
  summarise_all(funs(sum(!is.na(.))))
```

```
##   control_employment control_education control_retirement
## 1                262               262                262
##   control_cybersecurity
## 1                   262
```

Yes, subjects in control answer all the questions. There are 262 subjects in control.

```
# check if subjects in treatment answer all questions
d %>%
  select(treatment_employment, treatment_education, treatment_retirement, treatment_cybersecurity) %>%
  summarise_all(funs(sum(!is.na(.))))
```

```
##   treatment_employment treatment_education treatment_retirement
## 1                  295                 295                  295
##   treatment_cybersecurity
## 1                     295
```

Yes, subjects in treatment answer all the questions. There are 295 subjects in treatment.

Separate between treatment and control

```
# filter for subjects in control
control <- d %>% filter(!is.na(control_employment) &
                        !is.na(control_education) &
                        !is.na(control_retirement) &
                        !is.na(control_cybersecurity))
```

```
# verify that control has 262 subjects
nrow(control) == 262
```

```
## [1] TRUE
```

```
# filter for subjects in treatment
treatment <- d %>% filter(!is.na(treatment_employment) &
                          !is.na(treatment_education) &
```

```
                            !is.na(treatment_retirement) &
                            !is.na(treatment_cybersecurity))
```

```
# verify that treatment has 295 subjects
nrow(treatment) == 295
```

```
## [1] TRUE
```

Explore the covariates

1. Gender: There is slightly more male than female in the control group. There is slightly more female than male in the control group. Overall, they're equally distributed.

2. Age: Age has a positively skewed distribution with subjects mostly in the age range of 25-34. The distribution is approximately equal in treatment and control.

3. Highest education: The majority of the survey takers have a 4 year degree. The distribution is approximately equal in treatment and control.

4. Employment status: The majority of the subjects are employed full time. The distribution is approximately equal in treatment and control.

5. Marital status: The majority of the participants are married, followed by them being never married. The distribution is approximately equal in treatment and control.

6. Zip code:

7. Community: Subjects are twice more likely to live in suburban than in rural or urban communities. The distribution is approximately equal in treatment and control.

8. Can vote: Approximately 12% of the subjects cannot vote. There are more subjects who cannot vote in the treatment group than in the control group, but the majority of the people can vote.

9. Political party: There are in general more Democrats taking the survey followed by Independents then Republicans last.

10. Ethnicity: The majority of the subjects are white. The distribution is approximately equal in treatment and control.

11. Income: The majority of the subjects make income around $20,000 - $49,999 range. The distribution is positively skewed. Treatment seems to have a slightly higher income overall but not by much.

12. Have kids: There are slightly more subjects having kids than no kids but not by much.

13. Internet access via mobile phone: The majority of the subjects access their phone daily.

14. Internet access from home: The majority of the subjects access their internet daily from their home.

15. Internet access from work: The majority of the subjects access their internet daily from their work.

16. Who pays for the internet: The majority of the subjects pay internet by themselves.

17. Click counts: There are slightly more clicks in treatment than in control. Both follow the same distribution, which is high click counts, on average, for the first question then decreasing the number of click counts until the third question before rising up on the fourth question.

18. Duration in the question: On average, it takes the treatment group much longer to complete the question than the control group. WARNING: It is a little concerning that about half of the subjects in both treatment and control answer the question on average less than 30 seconds.

1. Gender

```
# gender frequency in the entire study
(total.gender.freq <- d %>%
  group_by(gender) %>%
  summarize(freq = sum(n())))
```

```
## # A tibble: 3 x 2
##   gender  freq
##   <fct>  <int>
## 1 ""         1
## 2 Female   282
## 3 Male     274
```

```
# percentage of noncompliant for the entire study
total.gender.freq[which(total.gender.freq == ""),]$freq / sum(total.gender.freq$freq) * 100
```

```
## [1] 0.1795332
```

```
# percentage of female for the entire study
total.gender.freq[which(total.gender.freq == "Female"),]$freq / sum(total.gender.freq$freq) * 100
```

```
## [1] 50.62837
```

```
# percentage of male for the entire study
total.gender.freq[which(total.gender.freq == "Male"),]$freq / sum(total.gender.freq$freq) * 100
```

```
## [1] 49.1921
```

```
# plot the gender frequency in the entire study
total.gender.bp <- barplot(total.gender.freq$freq, names.arg=total.gender.freq$gender, ylim=c(0,300))
text(total.gender.bp, 0, round(total.gender.freq$freq, 1), cex=1, pos=3)
```
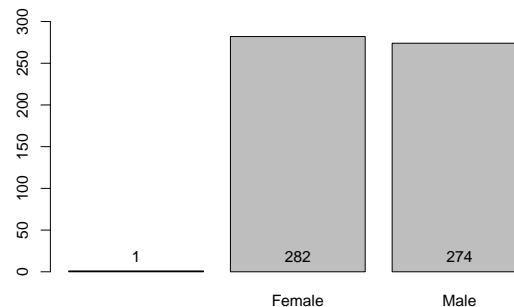

TOTAL no answer: 1 (0.1795332%) female: 282 (50.62837%) male: 274 (49.1921%)

There is almost equal number of male and female in the entire study.

```
# gender frequency in the control group
(control.gender.freq <- control %>%
  group_by(gender) %>%
  summarize(freq = sum(n())))
```

```
## # A tibble: 3 x 2
##   gender  freq
##   <fct>  <int>
```

```
## 1 ""          1
## 2 Female    127
## 3 Male      134
```

```r
# percentage of noncompliant in the control group
control.gender.freq[which(control.gender.freq == ""),]$freq / sum(control.gender.freq$freq) * 100
```

```
## [1] 0.3816794
```

```r
# percentage of female in the control group
control.gender.freq[which(control.gender.freq == "Female"),]$freq / sum(control.gender.freq$freq) * 100
```

```
## [1] 48.47328
```

```r
# percentage of male in the control group
control.gender.freq[which(control.gender.freq == "Male"),]$freq / sum(control.gender.freq$freq) * 100
```

```
## [1] 51.14504
```

```r
# plot the gender frequency in the control group
control.gender.bp <- barplot(control.gender.freq$freq, names.arg=control.gender.freq$gender, ylim=c(0,30
text(control.gender.bp, 0, round(control.gender.freq$freq, 1), cex=1, pos=3)
```
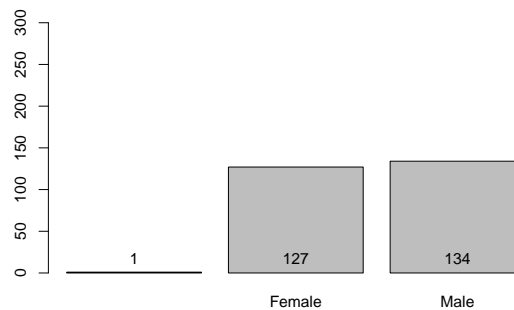

CONTROL no answer: 1 (0.3816794%) female: 127 (48.47328%) male: 134 (51.14504%)

There is slightly more male than female in the control group.

```r
# gender frequency in the treatment group
(treatment.gender.freq <- treatment %>%
  group_by(gender) %>%
  summarize(freq = sum(n())))
```

```
## # A tibble: 2 x 2
##   gender  freq
##   <fct>  <int>
## 1 Female   155
## 2 Male     140
```

```r
# percentage of female in the treatment group
treatment.gender.freq[which(treatment.gender.freq == "Female"),]$freq / sum(treatment.gender.freq$freq)
```

```
## [1] 52.54237
```

```r
# percentage of male in the treatment group
treatment.gender.freq[which(treatment.gender.freq == "Male"),]$freq / sum(treatment.gender.freq$freq) *
```

```
## [1] 47.45763
```

```
# plot the gender frequency in the treatment group
treatment.gender.bp <- barplot(treatment.gender.freq$freq, names.arg=treatment.gender.freq$gender, ylim=
text(treatment.gender.bp, 0, round(treatment.gender.freq$freq, 1), cex=1, pos=3)
```
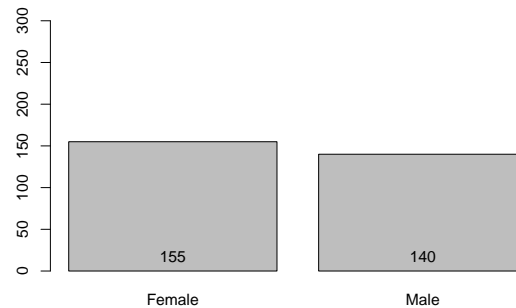

TREATMENT female: 155 (52.54237%) male: 140 (47.45763%)

There is slightly more female than male in the treatment group.

2. Age

```
# age frequency in the entire study
total.age.freq <- d %>%
  group_by(age) %>%
  summarize(freq = sum(n()))
```

```
# plot the age frequency in the entire study
total.age.bp <- barplot(total.age.freq$freq, names.arg=total.age.freq$age, ylim=c(0,250))
text(total.age.bp, 0, round(total.age.freq$freq, 1), cex=1, pos=3)
```
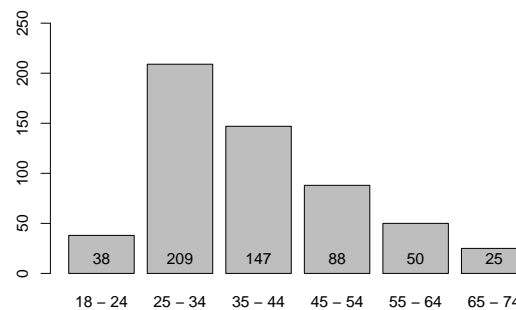


```
# age frequency in the control group
control.age.freq <- control %>%
  group_by(age) %>%
  summarize(freq = sum(n()))
```

```
# plot the age frequency in the control group
control.age.bp <- barplot(control.age.freq$freq, names.arg=control.age.freq$age, ylim=c(0,250))
```

```r
text(control.age.bp, 0, round(control.age.freq$freq, 1), cex=1, pos=3)
```
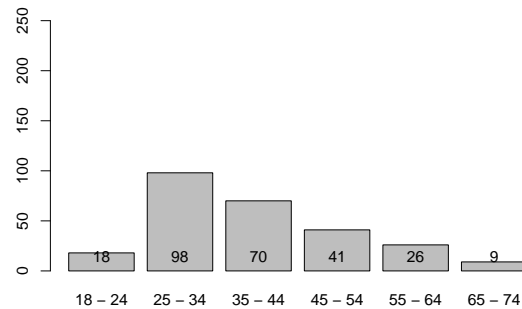


```r
# age frequency in the treatment group
treatment.age.freq <- treatment %>%
  group_by(age) %>%
  summarize(freq = sum(n()))
```

```r
# plot the age frequency in the treatment group
treatment.age.bp <- barplot(treatment.age.freq$freq, names.arg=treatment.age.freq$age, ylim=c(0,250))
text(treatment.age.bp, 0, round(treatment.age.freq$freq, 1), cex=1, pos=3)
```
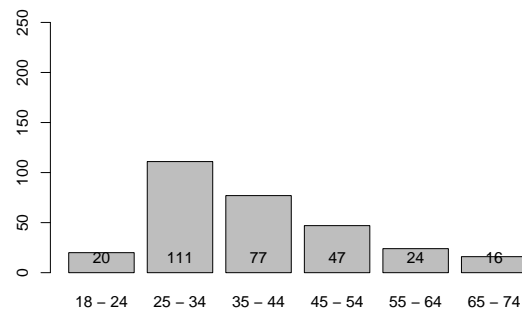

Age has a positively skewed distribution with subjects mostly in the age range of 25-34. The distribution is approximately equal in treatment and control.

3. Highest education

```r
highest_education.order <- c("Less than high school", "High school graduate", "Some college", "2 year de
```

```r
# highest_education frequency in the entire study
total.highest_education.freq <- d %>%
  group_by(highest_education) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(highest_education=highest_education.order), .)
```

```
## Joining, by = "highest_education"
```

```
## Warning: Column `highest_education` joining factor and character vector,
```

```
## coercing into character vector
```

```r
# plot the highest_education frequency in the entire study
par(mar=c(10,3,1,1))
total.highest_education.bp <- barplot(total.highest_education.freq$freq, names.arg=total.highest_educati
text(total.highest_education.bp, 0, round(total.highest_education.freq$freq, 1), cex=1, pos=3)
```
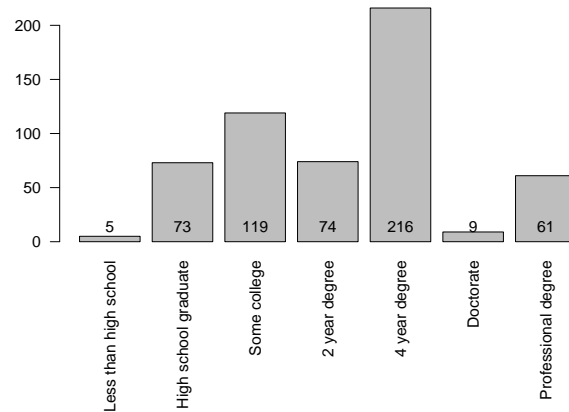


```r
# highest_education frequency in the control group
control.highest_education.freq <- control %>%
  group_by(highest_education) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(highest_education=highest_education.order), .)
```

```
## Joining, by = "highest_education"
```

```
## Warning: Column `highest_education` joining factor and character vector,
## coercing into character vector
```

```r
# plot the highest_education frequency in the control group
par(mar=c(10,3,1,1))
control.highest_education.bp <- barplot(control.highest_education.freq$freq, names.arg=control.highest_
text(control.highest_education.bp, 0, round(control.highest_education.freq$freq, 1), cex=1, pos=3)
```
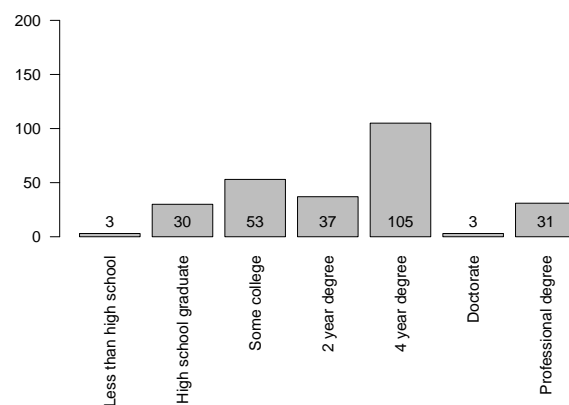


```r
# highest_education frequency in the treatment group
treatment.highest_education.freq <- treatment %>%
  group_by(highest_education) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(highest_education=highest_education.order), .)
```

```
## Joining, by = "highest_education"
```

```
## Warning: Column `highest_education` joining factor and character vector,
## coercing into character vector
```

```r
# plot the highest_education frequency in the treatment group
par(mar=c(10,3,1,1))
treatment.highest_education.bp <- barplot(treatment.highest_education.freq$freq, names.arg=treatment.hig
text(treatment.highest_education.bp, 0, round(treatment.highest_education.freq$freq, 1), cex=1, pos=3)
```
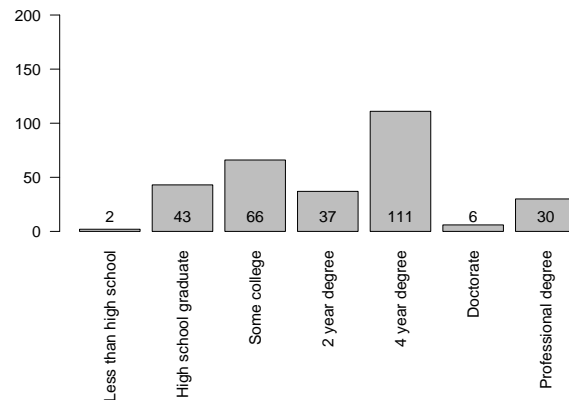

The majority of the survey takers have a 4 year degree. The distribution is approximately equal in treatment and control.

4. Employment status

```r
# employment_status frequency in the entire study
total.employment_status.freq <- d %>%
  group_by(employment_status) %>%
  summarize(freq = sum(n()))
```

```r
# plot the employment_status frequency in the entire study
par(mar=c(16,3,1,1))
total.employment_status.bp <- barplot(total.employment_status.freq$freq, names.arg=total.employment_stat
text(total.employment_status.bp, 0, round(total.employment_status.freq$freq, 1), cex=1, pos=3)
```
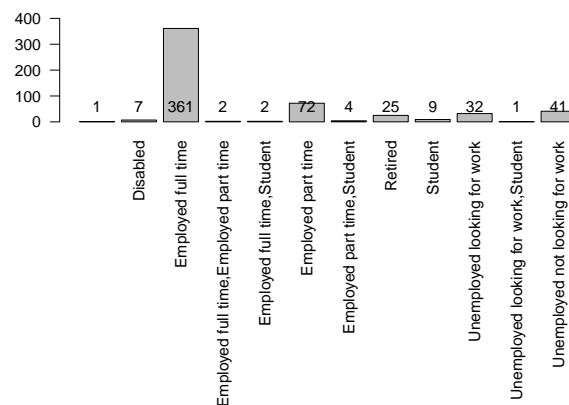


```r
# employment_status frequency in the control group
control.employment_status.freq <- control %>%
  group_by(employment_status) %>%
```

23

```
  summarize(freq = sum(n())))
```

```
# plot the employment_status frequency in the control group
par(mar=c(16,3,1,1))
control.employment_status.bp <- barplot(control.employment_status.freq$freq, names.arg=control.employmen
text(control.employment_status.bp, 0, round(control.employment_status.freq$freq, 1), cex=1, pos=3)
```
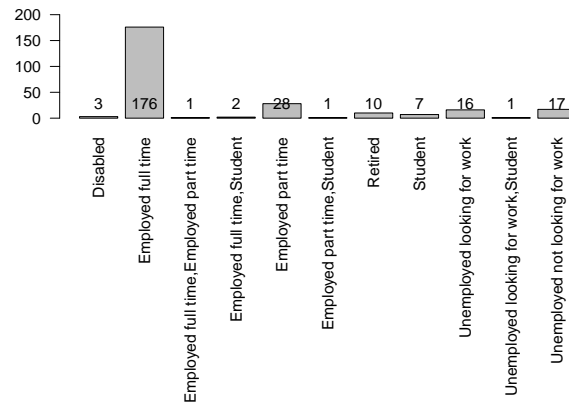


```
# employment_status frequency in the treatment group
treatment.employment_status.freq <- treatment %>%
  group_by(employment_status) %>%
  summarize(freq = sum(n())))
```

```
# plot the employment_status frequency in the treatment group
par(mar=c(16,3,1,1))
treatment.employment_status.bp <- barplot(treatment.employment_status.freq$freq, names.arg=treatment.emp
text(treatment.employment_status.bp, 0, round(treatment.employment_status.freq$freq, 1), cex=1, pos=3)
```
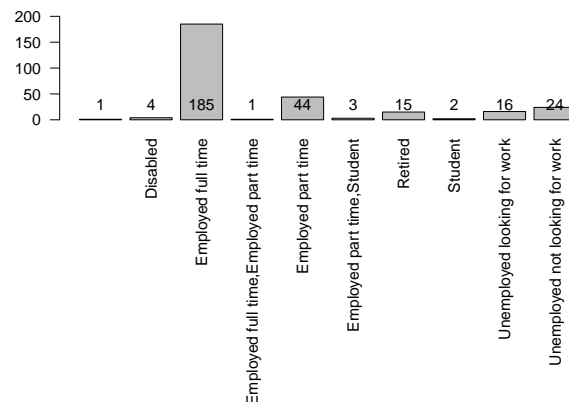

The majority of the subjects are employed full time. The distribution is approximately equal in treatment and control.

5. Marital status

```
# marital_status frequency in the entire study
total.marital_status.freq <- d %>%
  group_by(marital_status) %>%
  summarize(freq = sum(n())))
```

```
# plot the marital_status frequency in the entire study
par(mar=c(7,3,1,1))
total.marital_status.bp <- barplot(total.marital_status.freq$freq, names.arg=total.marital_status.freq$r
text(total.marital_status.bp, 0, round(total.marital_status.freq$freq, 1), cex=1, pos=3)
```
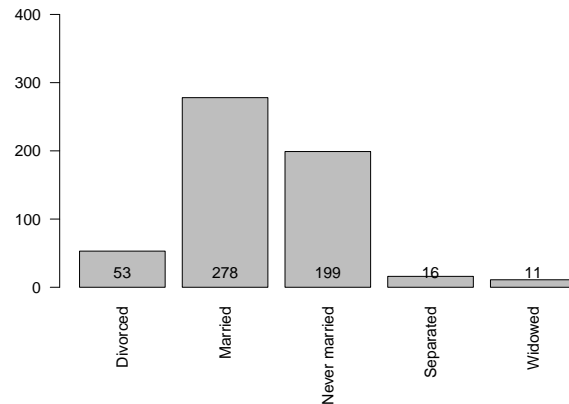


```
# marital_status frequency in the control group
control.marital_status.freq <- control %>%
  group_by(marital_status) %>%
  summarize(freq = sum(n()))
```

```
# plot the marital_status frequency in the control group
par(mar=c(7,3,1,1))
control.marital_status.bp <- barplot(control.marital_status.freq$freq, names.arg=control.marital_status
text(control.marital_status.bp, 0, round(control.marital_status.freq$freq, 1), cex=1, pos=3)
```
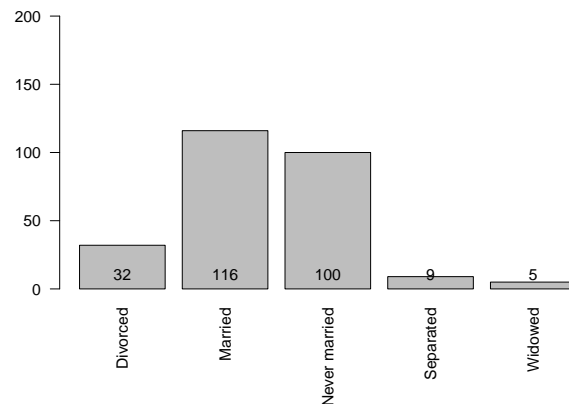


```
# marital_status frequency in the treatment group
treatment.marital_status.freq <- treatment %>%
  group_by(marital_status) %>%
  summarize(freq = sum(n()))
```

```
# plot the marital_status frequency in the treatment group
par(mar=c(7,3,1,1))
treatment.marital_status.bp <- barplot(treatment.marital_status.freq$freq, names.arg=treatment.marital_s
text(treatment.marital_status.bp, 0, round(treatment.marital_status.freq$freq, 1), cex=1, pos=3)
```
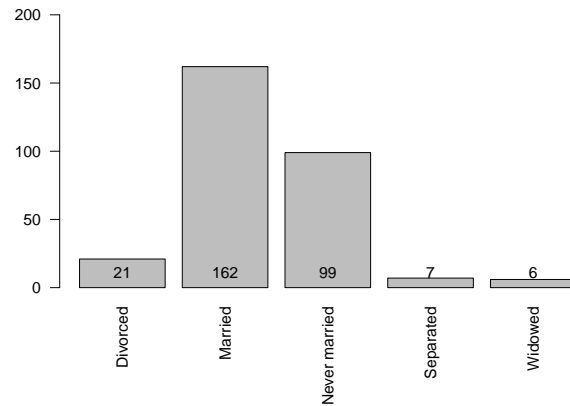
The majority of the participants are married, followed by them being never married. The distribution is approximately equal in treatment and control.

6. Zip code

TODO

7. Community

```r
# community frequency in the entire study
total.community.freq <- d %>%
  group_by(community) %>%
  summarize(freq = sum(n()))
```

```r
# plot the community frequency in the entire study
par(mar=c(7,3,1,1))
total.community.bp <- barplot(total.community.freq$freq, names.arg=total.community.freq$community, ylim=
text(total.community.bp, 0, round(total.community.freq$freq, 1), cex=1, pos=3)
```
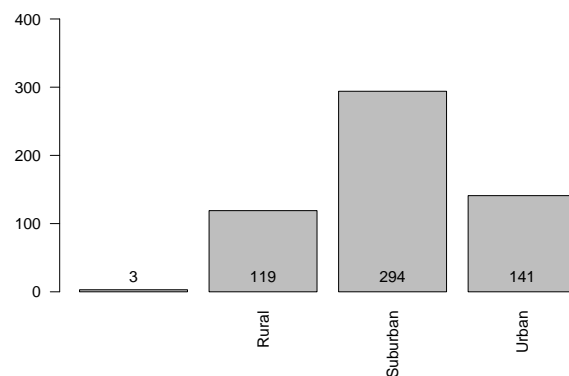


```r
# community frequency in the control group
control.community.freq <- control %>%
  group_by(community) %>%
  summarize(freq = sum(n()))
```

```r
# plot the community frequency in the control group
par(mar=c(7,3,1,1))
```

26

```
control.community.bp <- barplot(control.community.freq$freq, names.arg=control.community.freq$community
text(control.community.bp, 0, round(control.community.freq$freq, 1), cex=1, pos=3)
```
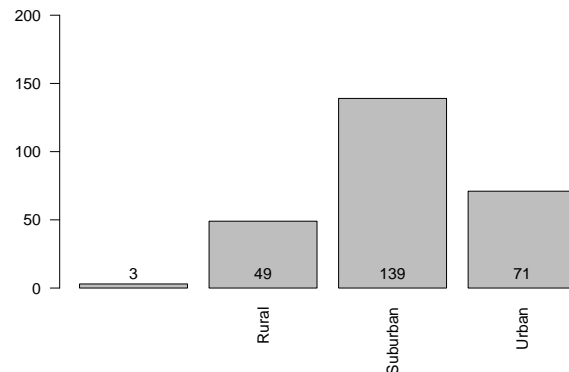


```
# community frequency in the treatment group
treatment.community.freq <- treatment %>%
  group_by(community) %>%
  summarize(freq = sum(n()))
```

```
# plot the community frequency in the treatment group
par(mar=c(7,3,1,1))
treatment.community.bp <- barplot(treatment.community.freq$freq, names.arg=treatment.community.freq$com
text(treatment.community.bp, 0, round(treatment.community.freq$freq, 1), cex=1, pos=3)
```
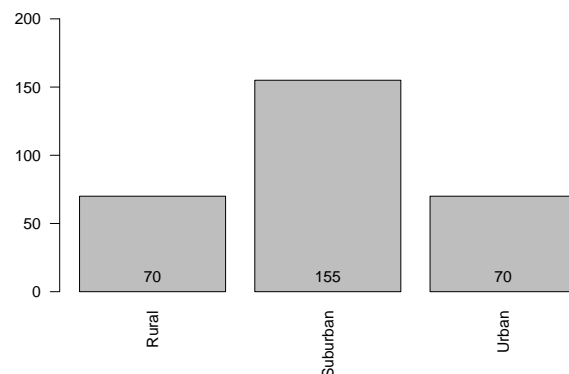

Subjects are twice more likely to live in suburban than in rural or urban communities. The distribution is approximately equal in treatment and control.

8. Can vote

```
# can_vote frequency in the entire study
total.can_vote.freq <- d %>%
  group_by(can_vote) %>%
  summarize(freq = sum(n()))
```

```
# plot the can_vote frequency in the entire study
par(mar=c(7,3,1,1))
total.can_vote.bp <- barplot(total.can_vote.freq$freq, names.arg=total.can_vote.freq$can_vote, ylim=c(0
text(total.can_vote.bp, 0, round(total.can_vote.freq$freq, 1), cex=1, pos=3)
```

27
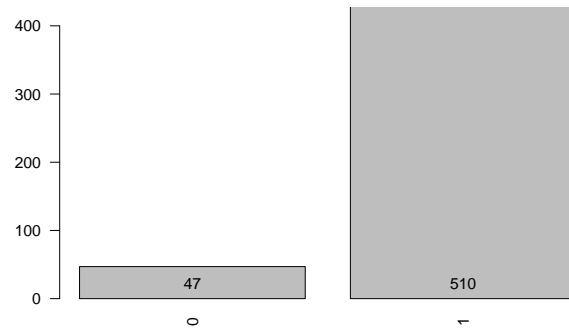
```r
# can_vote frequency in the control group
control.can_vote.freq <- control %>%
  group_by(can_vote) %>%
  summarize(freq = sum(n()))
```

```r
# plot the can_vote frequency in the control group
par(mar=c(7,3,1,1))
control.can_vote.bp <- barplot(control.can_vote.freq$freq, names.arg=control.can_vote.freq$can_vote, yl
text(control.can_vote.bp, 0, round(control.can_vote.freq$freq, 1), cex=1, pos=3)
```
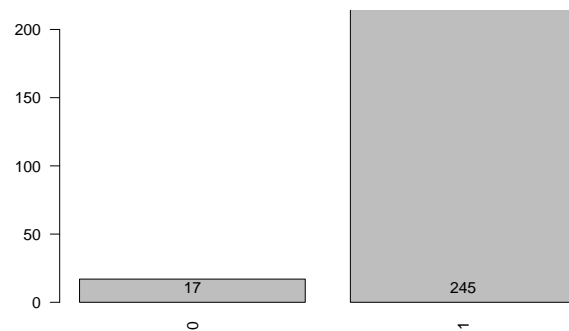


```r
# can_vote frequency in the treatment group
treatment.can_vote.freq <- treatment %>%
  group_by(can_vote) %>%
  summarize(freq = sum(n()))
```

```r
# plot the can_vote frequency in the treatment group
par(mar=c(7,3,1,1))
treatment.can_vote.bp <- barplot(treatment.can_vote.freq$freq, names.arg=treatment.can_vote.freq$can_vo
text(treatment.can_vote.bp, 0, round(treatment.can_vote.freq$freq, 1), cex=1, pos=3)
```
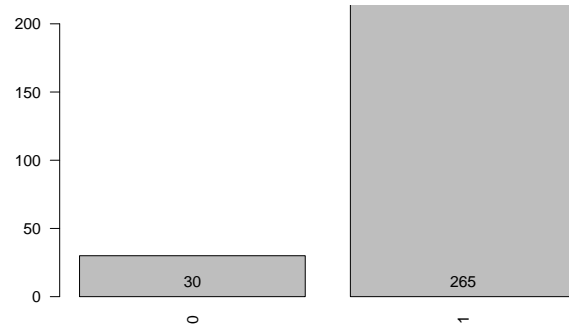
Approximately 12% of the subjects cannot vote. There are more subjects who cannot vote in the treatment group than in the control group, but the majority of the people can vote.

9. Political party

```
# political_party frequency in the entire study
total.political_party.freq <- d %>%
  group_by(political_party) %>%
  summarize(freq = sum(n()))
```

```
# plot the political_party frequency in the entire study
par(mar=c(10,3,1,1))
total.political_party.bp <- barplot(total.political_party.freq$freq, names.arg=total.political_party.fre
text(total.political_party.bp, 0, round(total.political_party.freq$freq, 1), cex=1, pos=3)
```
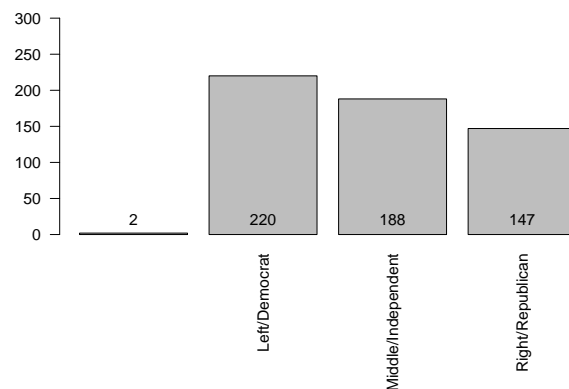


```
# political_party frequency in the control group
control.political_party.freq <- control %>%
  group_by(political_party) %>%
  summarize(freq = sum(n()))
```

```
# plot the political_party frequency in the control group
par(mar=c(10,3,1,1))
control.political_party.bp <- barplot(control.political_party.freq$freq, names.arg=control.political_par
text(control.political_party.bp, 0, round(control.political_party.freq$freq, 1), cex=1, pos=3)
```
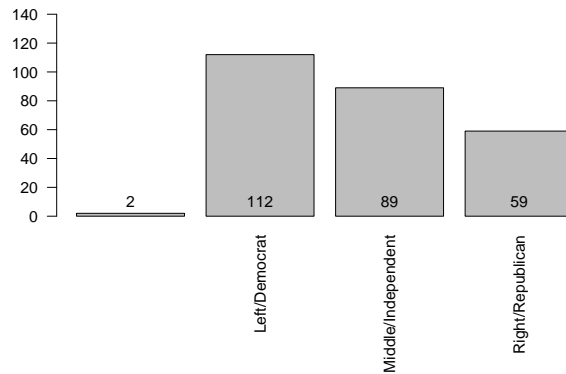
```r
# political_party frequency in the treatment group
treatment.political_party.freq <- treatment %>%
  group_by(political_party) %>%
  summarize(freq = sum(n()))
```

```r
# plot the political_party frequency in the treatment group
par(mar=c(10,3,1,1))
treatment.political_party.bp <- barplot(treatment.political_party.freq$freq, names.arg=treatment.politic
text(treatment.political_party.bp, 0, round(treatment.political_party.freq$freq, 1), cex=1, pos=3)
```
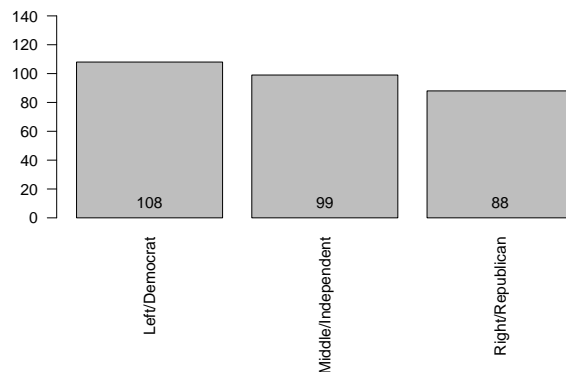

There are in general more Democrats taking the survey followed by Independents then Republicans last.

10. Ethnicity

```r
# ethnicity frequency in the entire study
total.ethnicity.freq <- d %>%
  group_by(ethnicity) %>%
  summarize(freq = sum(n()))
```

```r
total.ethnicity.freq
```

```
## # A tibble: 6 x 2
##   ethnicity                       freq
##   <fct>                          <int>
## 1 ""                                 1
## 2 American Indian or Alaska Native   4
## 3 Asian                             26
```

```
## 4 Black or African American            42
## 5 Other                                 16
## 6 White                                468
```

```r
# plot the ethnicity frequency in the entire study
par(mar=c(8,3,1,1))
total.ethnicity.bp <- barplot(total.ethnicity.freq$freq, names.arg=total.ethnicity.freq$ethnicity, ylim=
text(total.ethnicity.bp, 0, round(total.ethnicity.freq$freq, 1), cex=1, pos=3)
```
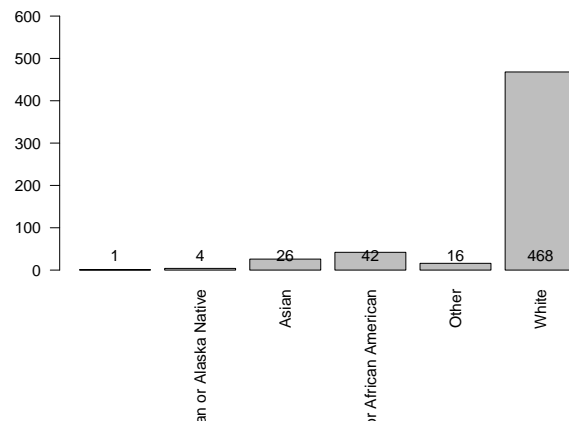


```r
# ethnicity frequency in the control group
control.ethnicity.freq <- control %>%
  group_by(ethnicity) %>%
  summarize(freq = sum(n()))
```

```r
# plot the ethnicity frequency in the control group
par(mar=c(8,3,1,1))
control.ethnicity.bp <- barplot(control.ethnicity.freq$freq, names.arg=control.ethnicity.freq$ethnicity
text(control.ethnicity.bp, 0, round(control.ethnicity.freq$freq, 1), cex=1, pos=3)
```
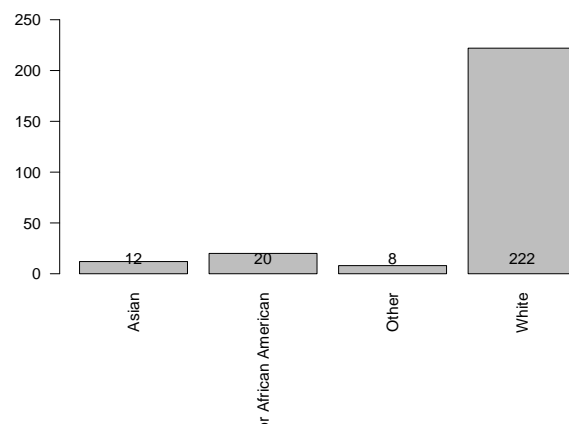


```r
# ethnicity frequency in the treatment group
treatment.ethnicity.freq <- treatment %>%
  group_by(ethnicity) %>%
  summarize(freq = sum(n()))
```

```r
# plot the ethnicity frequency in the treatment group
par(mar=c(8,3,1,1))
treatment.ethnicity.bp <- barplot(treatment.ethnicity.freq$freq, names.arg=treatment.ethnicity.freq$eth
text(treatment.ethnicity.bp, 0, round(treatment.ethnicity.freq$freq, 1), cex=1, pos=3)
```
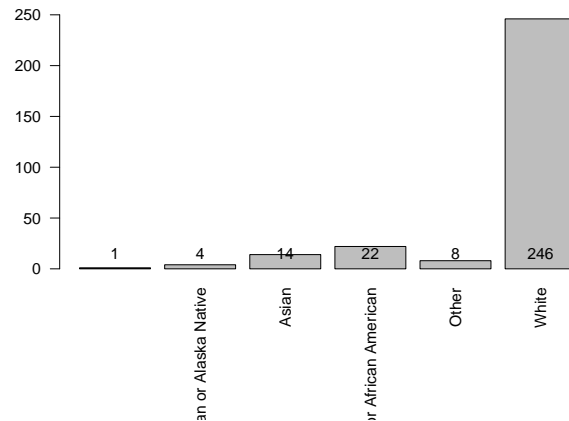
The majority of the subjects are white. The distribution is approximately equal in treatment and control.

11. Income

```
income.order <- c("Less than $10,000", "$10,000 - $19,999", "$20,000 - $29,999", "$30,000 - $39,999",
                  "$40,000 - $49,999", "$50,000 - $59,999", "$60,000 - $69,999", "$70,000 - $79,999",
                  "$80,000 - $89,999", "$90,000 - $99,999", "$100,000 - $149,999", "More than $150,000"
                  "Rather not say")
```

```
# income frequency in the entire study
total.income.freq <- d %>%
  group_by(income) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(income=income.order), .)
```

```
## Joining, by = "income"
```

```
## Warning: Column `income` joining factors with different levels, coercing to
## character vector
```

```
# plot the income frequency in the entire study
par(mar=c(10,3,1,1))
total.income.bp <- barplot(total.income.freq$freq, names.arg=total.income.freq$income, ylim=c(0,100), la
text(total.income.bp, 0, round(total.income.freq$freq, 1), cex=1, pos=3)
```
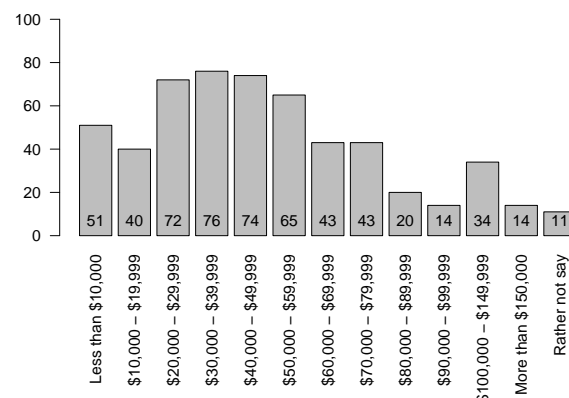


```
# income frequency in the control group
control.income.freq <- control %>%
  group_by(income) %>%
  summarize(freq = sum(n())) %>%
```

```r
  left_join(data.frame(income=income.order), .)
```

Joining, by = "income"

Warning: Column `income` joining factors with different levels, coercing to
character vector

```r
# plot the income frequency in the control group
par(mar=c(10,3,1,1))
control.income.bp <- barplot(control.income.freq$freq, names.arg=control.income.freq$income, ylim=c(0,5(
text(control.income.bp, 0, round(control.income.freq$freq, 1), cex=1, pos=3)
```
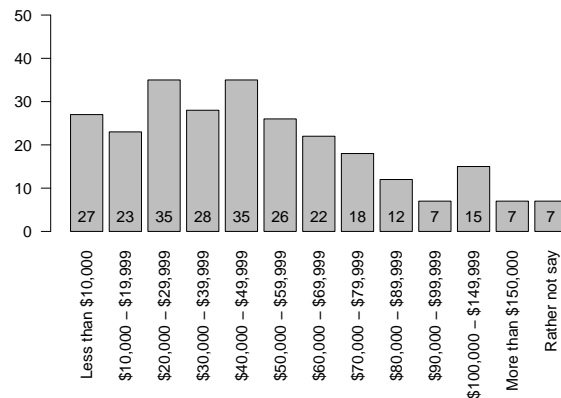


```r
# income frequency in the treatment group
treatment.income.freq <- treatment %>%
  group_by(income) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(income=income.order), .)
```

Joining, by = "income"

Warning: Column `income` joining factors with different levels, coercing to
character vector

```r
# plot the income frequency in the treatment group
par(mar=c(10,3,1,1))
treatment.income.bp <- barplot(treatment.income.freq$freq, names.arg=treatment.income.freq$income, ylim=
text(treatment.income.bp, 0, round(treatment.income.freq$freq, 1), cex=1, pos=3)
```
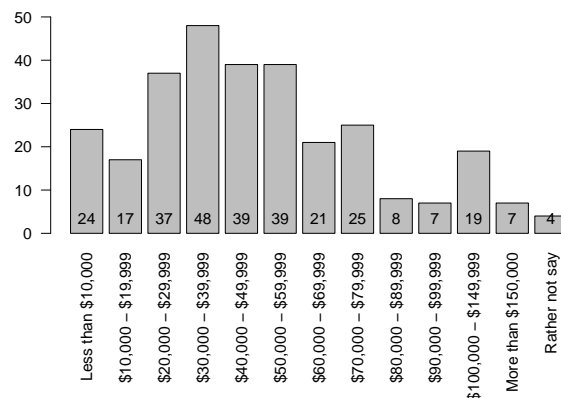

The majority of the subjects make income around $20,000 - $49,999 range. Treatment seems to have a slightly

higher income overall but not by much.

12. Have kids

```
# have_kids frequency in the entire study
total.have_kids.freq <- d %>%
  group_by(have_kids) %>%
  summarize(freq = sum(n()))
```

```
# plot the have_kids frequency in the entire study
par(mar=c(8,3,1,1))
total.have_kids.bp <- barplot(total.have_kids.freq$freq, names.arg=total.have_kids.freq$have_kids, ylim=
text(total.have_kids.bp, 0, round(total.have_kids.freq$freq, 1), cex=1, pos=3)
```
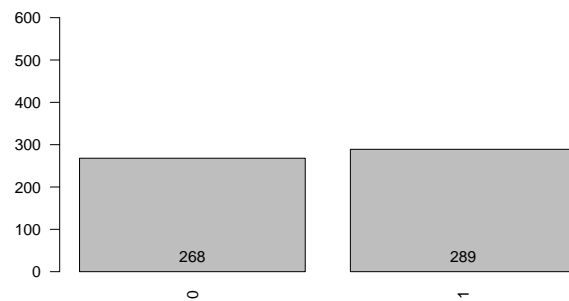


```
# have_kids frequency in the control group
control.have_kids.freq <- control %>%
  group_by(have_kids) %>%
  summarize(freq = sum(n()))
```

```
# plot the have_kids frequency in the control group
par(mar=c(8,3,1,1))
control.have_kids.bp <- barplot(control.have_kids.freq$freq, names.arg=control.have_kids.freq$have_kids
text(control.have_kids.bp, 0, round(control.have_kids.freq$freq, 1), cex=1, pos=3)
```
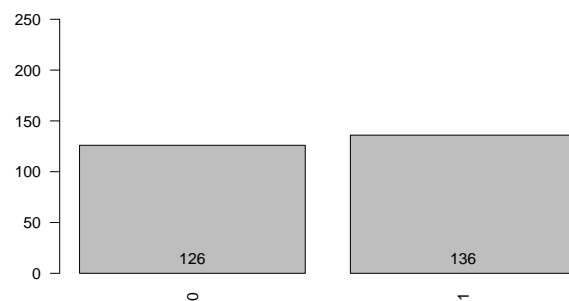


```
# have_kids frequency in the treatment group
treatment.have_kids.freq <- treatment %>%
  group_by(have_kids) %>%
```

```
  summarize(freq = sum(n()))
```

```r
# plot the have_kids frequency in the treatment group
par(mar=c(8,3,1,1))
treatment.have_kids.bp <- barplot(treatment.have_kids.freq$freq, names.arg=treatment.have_kids.freq$have
text(treatment.have_kids.bp, 0, round(treatment.have_kids.freq$freq, 1), cex=1, pos=3)
```
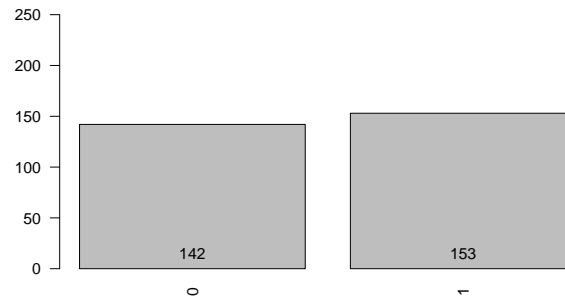

There are slightly more subjects having kids than no kids but not by much.

13. How often they access internet from their mobile phones

```r
internet_from_mobile.order <- c("I do not have a mobile phone", "Never", "Less than once a month", "Mont
```

```r
# internet_from_mobile frequency in the entire study
total.internet_from_mobile.freq <- d %>%
  group_by(internet_from_mobile) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(internet_from_mobile=internet_from_mobile.order), .)
```

```
## Joining, by = "internet_from_mobile"
```

```
## Warning: Column `internet_from_mobile` joining factors with different
## levels, coercing to character vector
```

```r
# plot the internet_from_mobile frequency in the entire study
par(mar=c(10,3,1,1))
total.internet_from_mobile.bp <- barplot(total.internet_from_mobile.freq$freq, names.arg=total.internet_
text(total.internet_from_mobile.bp, 0, round(total.internet_from_mobile.freq$freq, 1), cex=1, pos=3)
```
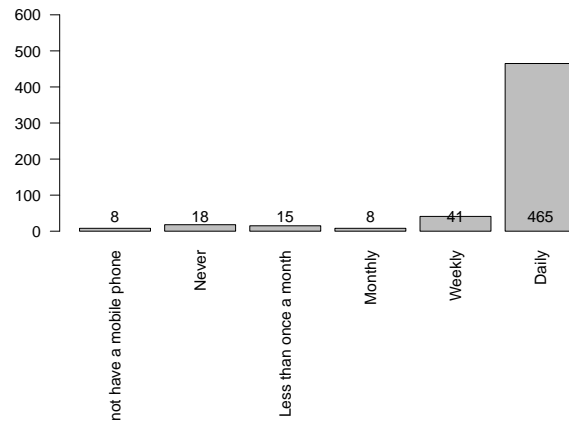
```r
# internet_from_mobile frequency in the control group
control.internet_from_mobile.freq <- control %>%
  group_by(internet_from_mobile) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(internet_from_mobile=internet_from_mobile.order), .)
```

```
## Joining, by = "internet_from_mobile"
```

```
## Warning: Column `internet_from_mobile` joining factors with different
## levels, coercing to character vector
```

```r
# plot the internet_from_mobile frequency in the control group
par(mar=c(10,3,1,1))
control.internet_from_mobile.bp <- barplot(control.internet_from_mobile.freq$freq, names.arg=control.in
text(control.internet_from_mobile.bp, 0, round(control.internet_from_mobile.freq$freq, 1), cex=1, pos=3)
```
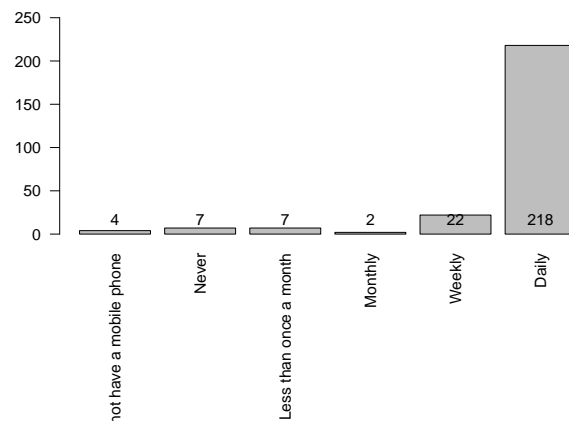


```r
# internet_from_mobile frequency in the treatment group
treatment.internet_from_mobile.freq <- treatment %>%
  group_by(internet_from_mobile) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(internet_from_mobile=internet_from_mobile.order), .)
```

```
## Joining, by = "internet_from_mobile"
```

```
## Warning: Column `internet_from_mobile` joining factors with different
## levels, coercing to character vector
```

```r
# plot the internet_from_mobile frequency in the treatment group
par(mar=c(10,3,1,1))
```

```
treatment.internet_from_mobile.bp <- barplot(treatment.internet_from_mobile.freq$freq, names.arg=treatm
text(treatment.internet_from_mobile.bp, 0, round(treatment.internet_from_mobile.freq$freq, 1), cex=1, p
```


The majority of the subjects access their phone daily.

14. How often they access internet from home

```
internet_from_home.order <- c("I do not have internet at my house", "Never", "Less than once a month",
```

```
# internet_from_home frequency in the entire study
total.internet_from_home.freq <- d %>%
  group_by(internet_from_home) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(internet_from_home=internet_from_home.order), .)
```

```
## Joining, by = "internet_from_home"
```

```
## Warning: Column `internet_from_home` joining factors with different levels,
## coercing to character vector
```

```
# plot the internet_from_home frequency in the entire study
par(mar=c(10,3,1,1))
total.internet_from_home.bp <- barplot(total.internet_from_home.freq$freq, names.arg=total.internet_from
text(total.internet_from_home.bp, 0, round(total.internet_from_home.freq$freq, 1), cex=1, pos=3)
```
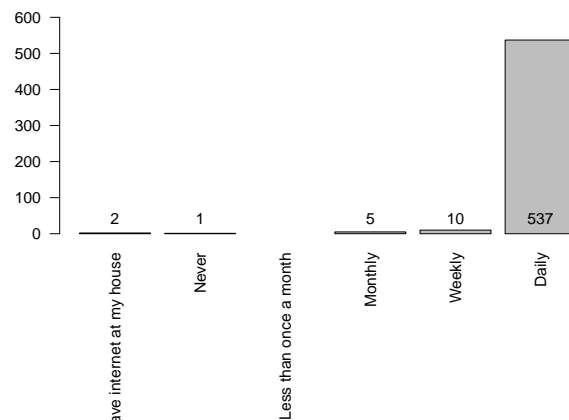


```
# internet_from_home frequency in the control group
control.internet_from_home.freq <- control %>%
  group_by(internet_from_home) %>%
```

```
  summarize(freq = sum(n())) %>%
  left_join(data.frame(internet_from_home=internet_from_home.order), .)
```

Joining, by = "internet_from_home"

Warning: Column `internet_from_home` joining factors with different levels,
coercing to character vector

```
# plot the internet_from_home frequency in the control group
par(mar=c(10,3,1,1))
control.internet_from_home.bp <- barplot(control.internet_from_home.freq$freq, names.arg=control.intern
text(control.internet_from_home.bp, 0, round(control.internet_from_home.freq$freq, 1), cex=1, pos=3)
```
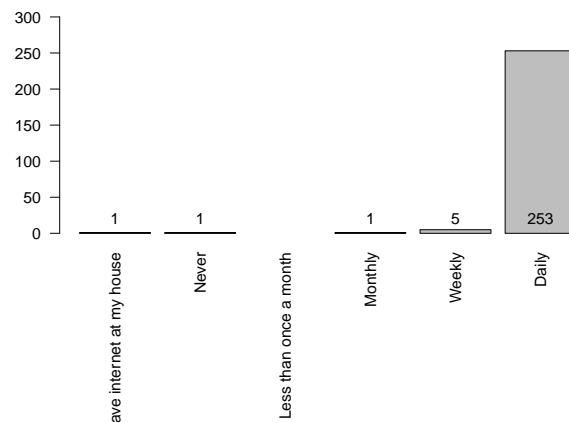


```
# internet_from_home frequency in the treatment group
treatment.internet_from_home.freq <- treatment %>%
  group_by(internet_from_home) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(internet_from_home=internet_from_home.order), .)
```

Joining, by = "internet_from_home"

Warning: Column `internet_from_home` joining factors with different levels,
coercing to character vector

```
# plot the internet_from_home frequency in the treatment group
par(mar=c(10,3,1,1))
treatment.internet_from_home.bp <- barplot(treatment.internet_from_home.freq$freq, names.arg=treatment.
text(treatment.internet_from_home.bp, 0, round(treatment.internet_from_home.freq$freq, 1), cex=1, pos=3)
```
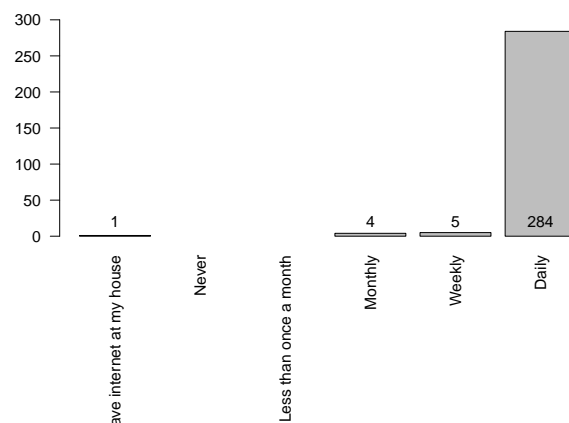
The majority of the subjects access their internet daily from their home.

15. How often they access internet from work

```
internet_from_work.order <- c("I am currently not working", "Never", "Less than once a month", "Monthly
```

```
# internet_from_work frequency in the entire study
total.internet_from_work.freq <- d %>%
  group_by(internet_from_work) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(internet_from_work=internet_from_work.order), .)
```

Joining, by = "internet_from_work"

Warning: Column `internet_from_work` joining factors with different levels,
coercing to character vector

```
# plot the internet_from_work frequency in the entire study
par(mar=c(10,3,1,1))
total.internet_from_work.bp <- barplot(total.internet_from_work.freq$freq, names.arg=total.internet_fro
text(total.internet_from_work.bp, 0, round(total.internet_from_work.freq$freq, 1), cex=1, pos=3)
```
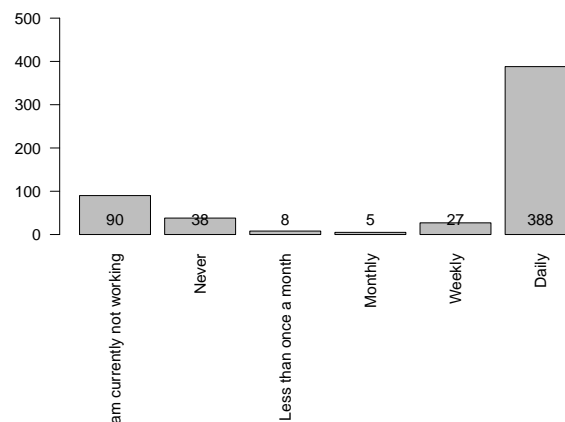


```
# internet_from_work frequency in the control group
control.internet_from_work.freq <- control %>%
  group_by(internet_from_work) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(internet_from_work=internet_from_work.order), .)
```

Joining, by = "internet_from_work"

Warning: Column `internet_from_work` joining factors with different levels,
coercing to character vector

```
# plot the internet_from_work frequency in the control group
par(mar=c(10,3,1,1))
control.internet_from_work.bp <- barplot(control.internet_from_work.freq$freq, names.arg=control.intern
text(control.internet_from_work.bp, 0, round(control.internet_from_work.freq$freq, 1), cex=1, pos=3)
```
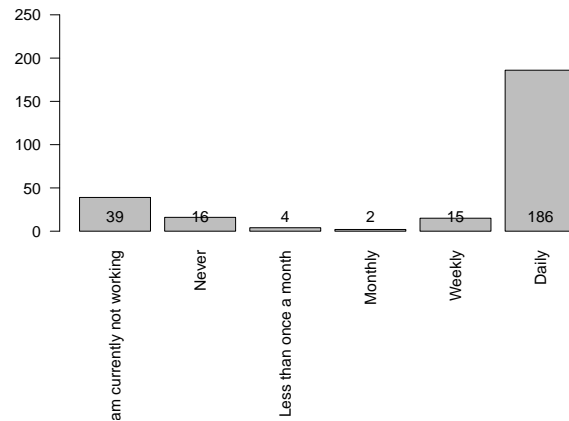
```r
# internet_from_work frequency in the treatment group
treatment.internet_from_work.freq <- treatment %>%
  group_by(internet_from_work) %>%
  summarize(freq = sum(n())) %>%
  left_join(data.frame(internet_from_work=internet_from_work.order), .)
```

```
## Joining, by = "internet_from_work"
```

```
## Warning: Column `internet_from_work` joining factors with different levels,
## coercing to character vector
```

```r
# plot the internet_from_work frequency in the treatment group
par(mar=c(10,3,1,1))
treatment.internet_from_work.bp <- barplot(treatment.internet_from_work.freq$freq, names.arg=treatment.
text(treatment.internet_from_work.bp, 0, round(treatment.internet_from_work.freq$freq, 1), cex=1, pos=3)
```
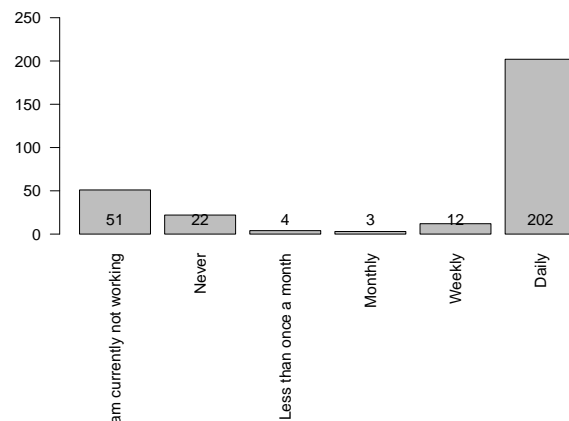

The majority of the subjects access their internet daily from their work.

16. Who pays the internet

```r
# who_pays_internet frequency in the entire study
total.who_pays_internet.freq <- d %>%
  group_by(who_pays_internet) %>%
  summarize(freq = sum(n()))
```

```r
# plot the who_pays_internet frequency in the entire study
par(mar=c(8,3,1,1))
```

```
total.who_pays_internet.bp <- barplot(total.who_pays_internet.freq$freq, names.arg=total.who_pays_intern
text(total.who_pays_internet.bp, 0, round(total.who_pays_internet.freq$freq, 1), cex=1, pos=3)
```
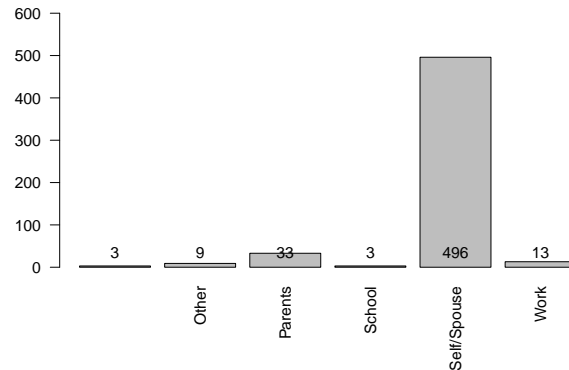


```
# who_pays_internet frequency in the control group
control.who_pays_internet.freq <- control %>%
  group_by(who_pays_internet) %>%
  summarize(freq = sum(n()))
```

```
# plot the who_pays_internet frequency in the control group
par(mar=c(8,3,1,1))
control.who_pays_internet.bp <- barplot(control.who_pays_internet.freq$freq, names.arg=control.who_pays_
text(control.who_pays_internet.bp, 0, round(control.who_pays_internet.freq$freq, 1), cex=1, pos=3)
```
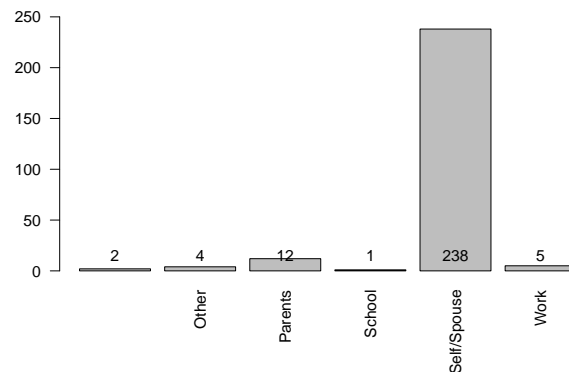


```
# who_pays_internet frequency in the treatment group
treatment.who_pays_internet.freq <- treatment %>%
  group_by(who_pays_internet) %>%
  summarize(freq = sum(n()))
```

```
# plot the who_pays_internet frequency in the treatment group
par(mar=c(8,3,1,1))
treatment.who_pays_internet.bp <- barplot(treatment.who_pays_internet.freq$freq, names.arg=treatment.who
text(treatment.who_pays_internet.bp, 0, round(treatment.who_pays_internet.freq$freq, 1), cex=1, pos=3)
```
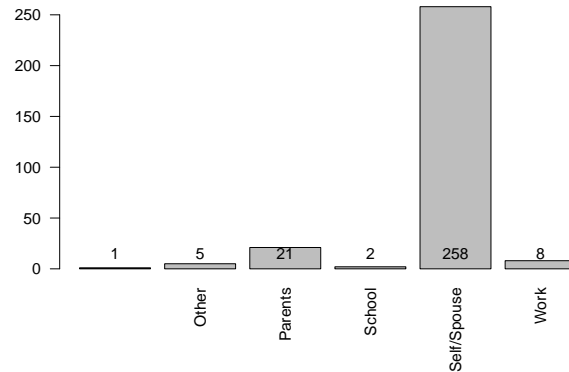
The majority of the subjects pay internet by themselves.

17. Click counts

```
# summary of click count per control question
summary(control$control_employment_Click.Count)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   1.000   3.000   4.523   5.750  43.000
```

```
summary(control$control_education_Click.Count)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   1.000   2.000   3.538   4.000  47.000
```

```
summary(control$control_retirement_Click.Count)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    1.00    1.00    2.00    3.13    3.00   35.00
```

```
summary(control$control_cybersecurity_Click.Count)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   1.000   2.000   3.401   4.000  38.000
```

```
# summary of click count per treatment question
summary(treatment$treatment_employment_Click.Count)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   1.000   3.000   4.814   5.000  39.000
```

```
summary(treatment$treatment_education_Click.Count)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   1.000   2.000   3.844   4.000  24.000
```

```
summary(treatment$treatment_retirement_Click.Count)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   1.000   2.000   3.647   4.000  26.000
```

```
summary(treatment$treatment_cybersecurity_Click.Count)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   1.000   2.000   3.763   5.000  33.000
```

```r
boxplot(control$control_employment_Click.Count,
  control$control_education_Click.Count,
  control$control_retirement_Click.Count,
  control$control_cybersecurity_Click.Count,
  main="control's click count",
  names=c("employment", "education\n(baseline)", "retirement", "cybersecurity"))

boxplot(treatment$treatment_employment_Click.Count,
  treatment$treatment_education_Click.Count,
  treatment$treatment_retirement_Click.Count,
  treatment$treatment_cybersecurity_Click.Count,
  main="treatment's click count",
  names=c("employment", "education\n(baseline)", "retirement", "cybersecurity"))
```
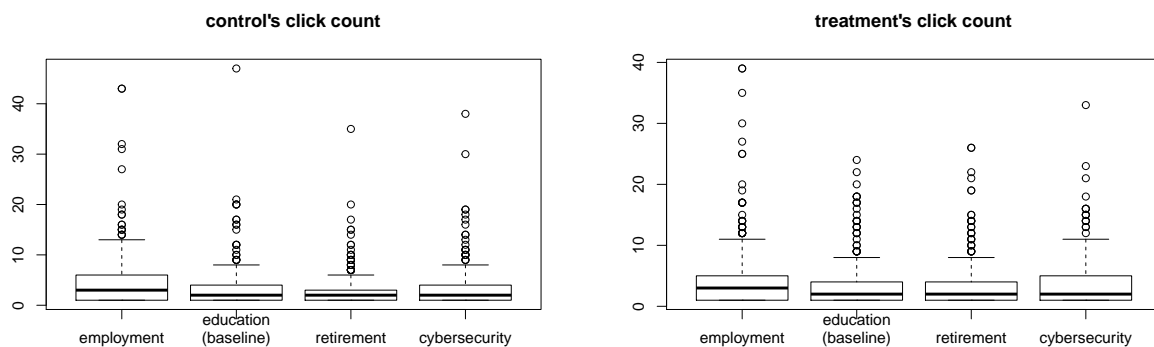

There are slightly more clicks in treatment than in control, but both follow the same distribution, which is high click counts, on average, for the first question then decreasing the number of click counts until the third question before rising up on the fourth question.

18. Length of time spent on each question

Since we supress the next button for 30 seconds, we should see that each subject spends on each question 30 seconds or longer.

use _Page.Submit instead of _Last.Click time = _Page.Submit - _First.Click

```r
# determine how long each subject takes to answer the question (in seconds)
control$control_employment_Duration.in.sec <-
  control$control_employment_Page.Submit - control$control_employment_First.Click
control$control_education_Duration.in.sec <-
  control$control_education_Page.Submit - control$control_education_First.Click
control$control_retirement_Duration.in.sec <-
  control$control_retirement_Page.Submit - control$control_retirement_First.Click
control$control_cybersecurity_Duration.in.sec <-
  control$control_cybersecurity_Page.Submit - control$control_cybersecurity_First.Click

treatment$treatment_employment_Duration.in.sec <-
  treatment$treatment_employment_Page.Submit - treatment$treatment_employment_First.Click
treatment$treatment_education_Duration.in.sec <-
  treatment$treatment_education_Page.Submit - treatment$treatment_education_First.Click
treatment$treatment_retirement_Duration.in.sec <-
  treatment$treatment_retirement_Page.Submit - treatment$treatment_retirement_First.Click
```

```r
treatment$treatment_cybersecurity_Duration.in.sec <-
  treatment$treatment_cybersecurity_Page.Submit - treatment$treatment_cybersecurity_First.Click
```

```r
# summary of duration per control question
summary(control$control_employment_Duration.in.sec)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.708   8.516  25.939  30.754  40.647 297.730
```

```r
summary(control$control_education_Duration.in.sec)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.719   6.369  25.105  31.359  43.478 392.031
```

```r
summary(control$control_retirement_Duration.in.sec)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.693   9.536  29.294  31.772  40.684 262.674
```

```r
summary(control$control_cybersecurity_Duration.in.sec)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.664   7.713  28.851  32.260  41.879 172.948
```

```r
# summary of duration per treatment question
summary(treatment$treatment_employment_Duration.in.sec)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.641  10.258  28.688  35.657  43.405 330.585
```

```r
summary(treatment$treatment_education_Duration.in.sec)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.829   6.699  28.240  35.640  44.170 460.710
```

```r
summary(treatment$treatment_retirement_Duration.in.sec)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.618   9.441  28.125  31.233  41.475 256.388
```

```r
summary(treatment$treatment_cybersecurity_Duration.in.sec)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.630   9.594  33.279  33.953  44.709 207.076
```

```r
boxplot(control$control_employment_Duration.in.sec,
  control$control_education_Duration.in.sec,
  control$control_retirement_Duration.in.sec,
  control$control_cybersecurity_Duration.in.sec,
  main="control's duration (sec) in each question",
  names=c("employment", "education\n(baseline)", "retirement", "cybersecurity"))

boxplot(treatment$treatment_employment_Duration.in.sec,
  treatment$treatment_education_Duration.in.sec,
  treatment$treatment_retirement_Duration.in.sec,
  treatment$treatment_cybersecurity_Duration.in.sec,
  main="treatment's duration (sec) in each question",
  names=c("employment", "education\n(baseline)", "retirement", "cybersecurity"))
```

control's duration (sec) in each question   **treatment's duration (sec) in each question**
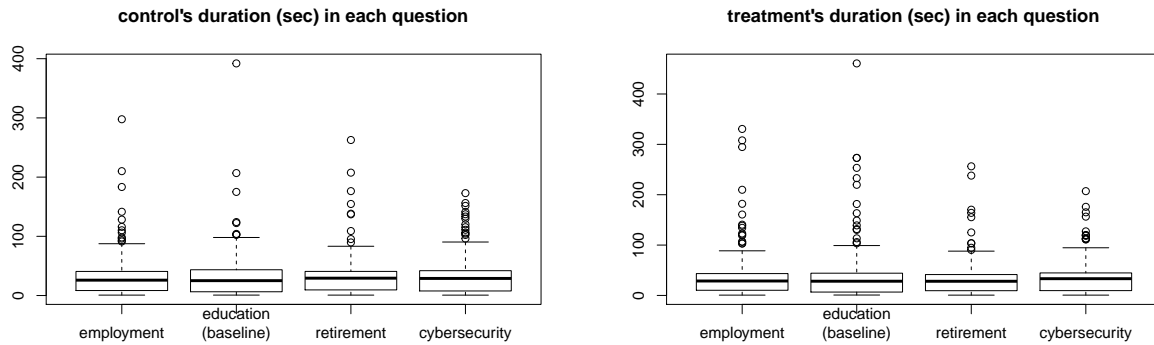
On average, it takes the treatment group much longer to complete the question than the control group.

```r
# number of subjects in control who took each question less than 30 seconds
nrow(control[which(control$control_employment_Duration.in.sec < 30),])
```

```
## [1] 149
```

```r
nrow(control[which(control$control_education_Duration.in.sec < 30),])
```

```
## [1] 143
```

```r
nrow(control[which(control$control_retirement_Duration.in.sec < 30),])
```

```
## [1] 135
```

```r
nrow(control[which(control$control_cybersecurity_Duration.in.sec < 30),])
```

```
## [1] 136
```

```r
# number of subjects in control
nrow(control)
```

```
## [1] 262
```

```r
# number of subjects in treatment who toko each question less than 30 seconds
nrow(treatment[which(treatment$treatment_employment_Duration.in.sec < 30),])
```

```
## [1] 150
```

```r
nrow(treatment[which(treatment$treatment_education_Duration.in.sec < 30),])
```

```
## [1] 152
```

```r
nrow(treatment[which(treatment$treatment_retirement_Duration.in.sec < 30),])
```

```
## [1] 151
```

```r
nrow(treatment[which(treatment$treatment_cybersecurity_Duration.in.sec < 30),])
```

```
## [1] 135
```

```r
# number of subjects in treatment
nrow(treatment)
```

```
## [1] 295
```

Cross Section of Covariates

TODO

a pre-analysis/EDA, just looking at some plots of scores for each answer, with a few cuts by covariates (e.g. histograms by political preference, gender; box-whisker plots for age groups, etc.)

1. age x gender

2. Employment: age x employment, gender x employment, ethnicity x employment, educ x employment

```
# cross section of education vs employment
educXemp <- d %>%
  group_by(highest_education, employment_status) %>%
  summarize(freq = sum(n()))
```

3. Income: ... x income: should see similar result as ... x employment

4. Community: married x community, have_kids x community

5. Party: age x party, gender x party, ethnicity x party, educ x party, income x party, community x party can_vote x party

6.

Analysis of each research question

2) then, for each question, starting with our education placebo test, we have a *stargazer* output that has 3 regressions: a) with only the treatment dummy, b) with treatment plus key covariates, and c) with treatment, key covariates AND interaction terms (i.e. HTEs)

- Block on: political_party

- Key covarites for each question:

- employment: income, employment_status

- (baseline) education: income, highest_education

- retirement: income, age

- cybersecurity: internet_from_mobile, internet_from_home, internet_from_work, who_pays_internet

- other covariates: can_vote, gender, age, ethnicity, marital_status, have_kids, zip_code, click_counts, duration

all covariates: gender, age, highest_education, employment_status, marital_status, zip_code, community, can_vote, political_party, ethnicity, income, have_kids, internet_from_mobile, internet_from_home, internet_from_work, who_pays_internet, click_counts, duration

```
# summary of sentiment result for each control question
summary(control$control_employment)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    0.00   41.00   63.50   59.48   77.00  100.00
```

```
summary(control$control_education)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    0.00   27.25   39.00   42.66   60.00   91.00
```

```
summary(control$control_retirement)
```

```
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     0.00   20.00   40.00   41.69   65.00  100.00
```

```
summary(control$control_cybersecurity)
```

```
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     0.00   61.00   73.00   70.07   85.00  100.00
```

```
# summary of sentiment result for each treatment question
summary(treatment$treatment_employment)
```

```
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     0.00   40.00   64.00   59.37   75.50  100.00
```

```
summary(treatment$treatment_education)
```

```
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     0.00   28.00   40.00   44.79   65.00  100.00
```

```
summary(treatment$treatment_retirement)
```

```
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     0.00   24.00   41.00   44.69   67.50  100.00
```

```
summary(treatment$treatment_cybersecurity)
```

```
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     1.00   60.00   72.00   69.93   85.00  100.00
```

```
boxplot(control$control_employment,
  control$control_education,
  control$control_retirement,
  control$control_cybersecurity,
  main="control's sentiment result for each question",
  names=c("employment", "education\n(baseline)", "retirement", "cybersecurity"))

boxplot(treatment$treatment_employment,
  treatment$treatment_education,
  treatment$treatment_retirement,
  treatment$treatment_cybersecurity,
  main="treatment's sentiment result for each question",
  names=c("employment", "education\n(baseline)", "retirement", "cybersecurity"))
```
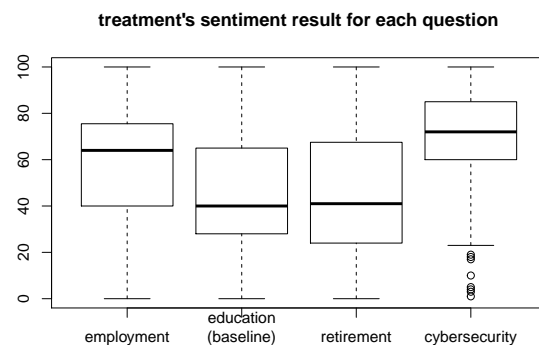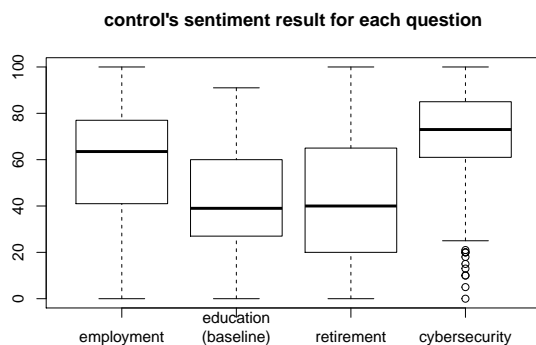
(Baseline) Education

Education is the second question we asked in both treatment and control. It acts as our baseline because it does not include the name of our president.

block: political_party covariate: highest_education + income_class interaction term: highest_education * income_class

We define income class as follows: * poor: $39,999 and below * middle: $40,000 - $149,999 * rich: $150,000 and above

```r
# define income class
define_income_class <- function(income_range) {
  if(income_range %in% c("Less than $10,000", "$20,000 - $29,999", "$30,000 - $39,999")) {
    return(factor("poor"))
  } else if(income_range == "More than $150,000") {
    return(factor("rich"))
  } else {
    return(factor("middle"))
  }
}
control$income_class <- sapply(control$income, define_income_class)
treatment$income_class <- sapply(treatment$income, define_income_class)
```

```r
# control
control %>%
  lm(control_education ~ political_party + highest_education + income_class +
                         highest_education * income_class,
     data = .) %>%
  # coeftest(., vcovHC(.))
  summary(.)
```

```
##
## Call:
## lm(formula = control_education ~ political_party + highest_education +
##     income_class + highest_education * income_class, data = .)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -46.293 -14.982  -3.638  17.415  50.743
##
## Coefficients: (6 not defined because of singularities)
##                                                      Estimate
## (Intercept)                                           42.0073
## political_partyLeft/Democrat                           3.3967
## political_partyMiddle/Independent                      5.6379
## political_partyRight/Republican                       10.0861
## highest_education4 year degree                        -8.6287
## highest_educationDoctorate                            -9.2816
## highest_educationHigh school graduate                -11.0784
## highest_educationLess than high school                30.3548
## highest_educationProfessional degree                  -9.0177
## highest_educationSome college                         -4.8905
## income_classmiddle                                    -2.7660
## income_classrich                                       4.3659
## highest_education4 year degree:income_classmiddle     10.0420
## highest_educationDoctorate:income_classmiddle              NA
```

48

```
## highest_educationHigh school graduate:income_classmiddle    -1.6260
## highest_educationLess than high school:income_classmiddle  -32.1135
## highest_educationProfessional degree:income_classmiddle      4.7607
## highest_educationSome college:income_classmiddle             1.5097
## highest_education4 year degree:income_classrich                  NA
## highest_educationDoctorate:income_classrich                      NA
## highest_educationHigh school graduate:income_classrich           NA
## highest_educationLess than high school:income_classrich          NA
## highest_educationProfessional degree:income_classrich        0.4031
## highest_educationSome college:income_classrich                   NA
##                                                            Std. Error
## (Intercept)                                                   17.6238
## political_partyLeft/Democrat                                  16.7005
## political_partyMiddle/Independent                             16.7548
## political_partyRight/Republican                               16.6983
## highest_education4 year degree                                 7.2463
## highest_educationDoctorate                                    13.5175
## highest_educationHigh school graduate                         8.1155
## highest_educationLess than high school                        22.8571
## highest_educationProfessional degree                         11.5594
## highest_educationSome college                                  7.2792
## income_classmiddle                                             7.5249
## income_classrich                                              16.1198
## highest_education4 year degree:income_classmiddle              8.9849
## highest_educationDoctorate:income_classmiddle                      NA
## highest_educationHigh school graduate:income_classmiddle      11.0723
## highest_educationLess than high school:income_classmiddle     28.0080
## highest_educationProfessional degree:income_classmiddle       13.4604
## highest_educationSome college:income_classmiddle               9.7337
## highest_education4 year degree:income_classrich                    NA
## highest_educationDoctorate:income_classrich                        NA
## highest_educationHigh school graduate:income_classrich             NA
## highest_educationLess than high school:income_classrich            NA
## highest_educationProfessional degree:income_classrich         21.5562
## highest_educationSome college:income_classrich                     NA
##                                                            t value Pr(>|t|)
## (Intercept)                                                  2.384   0.0179
## political_partyLeft/Democrat                                 0.203   0.8390
## political_partyMiddle/Independent                            0.336   0.7368
## political_partyRight/Republican                              0.604   0.5464
## highest_education4 year degree                              -1.191   0.2349
## highest_educationDoctorate                                  -0.687   0.4930
## highest_educationHigh school graduate                       -1.365   0.1735
## highest_educationLess than high school                       1.328   0.1854
## highest_educationProfessional degree                        -0.780   0.4361
## highest_educationSome college                               -0.672   0.5023
## income_classmiddle                                          -0.368   0.7135
## income_classrich                                             0.271   0.7867
## highest_education4 year degree:income_classmiddle            1.118   0.2648
## highest_educationDoctorate:income_classmiddle                  NA       NA
## highest_educationHigh school graduate:income_classmiddle    -0.147   0.8834
## highest_educationLess than high school:income_classmiddle   -1.147   0.2527
## highest_educationProfessional degree:income_classmiddle      0.354   0.7239
## highest_educationSome college:income_classmiddle             0.155   0.8769
```

```
## highest_education4 year degree:income_classrich                   NA        NA
## highest_educationDoctorate:income_classrich                        NA        NA
## highest_educationHigh school graduate:income_classrich             NA        NA
## highest_educationLess than high school:income_classrich            NA        NA
## highest_educationProfessional degree:income_classrich            0.019    0.9851
## highest_educationSome college:income_classrich                     NA        NA
##
## (Intercept)                                                         *
## political_partyLeft/Democrat
## political_partyMiddle/Independent
## political_partyRight/Republican
## highest_education4 year degree
## highest_educationDoctorate
## highest_educationHigh school graduate
## highest_educationLess than high school
## highest_educationProfessional degree
## highest_educationSome college
## income_classmiddle
## income_classrich
## highest_education4 year degree:income_classmiddle
## highest_educationDoctorate:income_classmiddle
## highest_educationHigh school graduate:income_classmiddle
## highest_educationLess than high school:income_classmiddle
## highest_educationProfessional degree:income_classmiddle
## highest_educationSome college:income_classmiddle
## highest_education4 year degree:income_classrich
## highest_educationDoctorate:income_classrich
## highest_educationHigh school graduate:income_classrich
## highest_educationLess than high school:income_classrich
## highest_educationProfessional degree:income_classrich
## highest_educationSome college:income_classrich
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 21.98 on 244 degrees of freedom
## Multiple R-squared:  0.0571, Adjusted R-squared:  -0.008595
## F-statistic: 0.8692 on 17 and 244 DF,  p-value: 0.6112
```

There are no significant outlook subjects in control have over the education system.

```r
# treatment
treatment %>%
  lm(treatment_education ~ political_party + highest_education + income_class +
                           highest_education * income_class,
     data = .) %>%
  # coeftest(., vcovHC(.))
  summary(.)
```

```
##
## Call:
## lm(formula = treatment_education ~ political_party + highest_education +
##      income_class + highest_education * income_class, data = .)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
```

```
## -48.879 -17.922  -1.676  18.632  63.425
##
## Coefficients: (6 not defined because of singularities)
##                                                         Estimate
## (Intercept)                                               46.965
## political_partyMiddle/Independent                         -3.737
## political_partyRight/Republican                            5.596
## highest_education4 year degree                            -1.682
## highest_educationDoctorate                                -1.229
## highest_educationHigh school graduate                      5.773
## highest_educationLess than high school                    -3.228
## highest_educationProfessional degree                       2.661
## highest_educationSome college                             -6.654
## income_classmiddle                                       -13.880
## income_classrich                                         -26.055
## highest_education4 year degree:income_classmiddle         13.702
## highest_educationDoctorate:income_classmiddle                 NA
## highest_educationHigh school graduate:income_classmiddle   5.318
## highest_educationLess than high school:income_classmiddle 35.143
## highest_educationProfessional degree:income_classmiddle    7.829
## highest_educationSome college:income_classmiddle          21.244
## highest_education4 year degree:income_classrich           39.682
## highest_educationDoctorate:income_classrich                   NA
## highest_educationHigh school graduate:income_classrich        NA
## highest_educationLess than high school:income_classrich       NA
## highest_educationProfessional degree:income_classrich         NA
## highest_educationSome college:income_classrich                NA
##                                                         Std. Error
## (Intercept)                                                  6.259
## political_partyMiddle/Independent                            3.378
## political_partyRight/Republican                              3.506
## highest_education4 year degree                               7.340
## highest_educationDoctorate                                  11.041
## highest_educationHigh school graduate                        7.724
## highest_educationLess than high school                      24.491
## highest_educationProfessional degree                        14.940
## highest_educationSome college                                7.132
## income_classmiddle                                           7.870
## income_classrich                                            21.634
## highest_education4 year degree:income_classmiddle            9.419
## highest_educationDoctorate:income_classmiddle                  NA
## highest_educationHigh school graduate:income_classmiddle    10.705
## highest_educationLess than high school:income_classmiddle   34.586
## highest_educationProfessional degree:income_classmiddle     16.548
## highest_educationSome college:income_classmiddle             9.808
## highest_education4 year degree:income_classrich             24.473
## highest_educationDoctorate:income_classrich                    NA
## highest_educationHigh school graduate:income_classrich         NA
## highest_educationLess than high school:income_classrich        NA
## highest_educationProfessional degree:income_classrich          NA
## highest_educationSome college:income_classrich                 NA
##                                                         t value Pr(>|t|)
## (Intercept)                                               7.503 8.45e-13
## political_partyMiddle/Independent                        -1.106   0.2696
```

```
## political_partyRight/Republican                                          1.596    0.1116
## highest_education4 year degree                                           -0.229    0.8189
## highest_educationDoctorate                                               -0.111    0.9115
## highest_educationHigh school graduate                                     0.747    0.4554
## highest_educationLess than high school                                   -0.132    0.8952
## highest_educationProfessional degree                                      0.178    0.8588
## highest_educationSome college                                            -0.933    0.3517
## income_classmiddle                                                       -1.764    0.0789
## income_classrich                                                         -1.204    0.2295
## highest_education4 year degree:income_classmiddle                         1.455    0.1469
## highest_educationDoctorate:income_classmiddle                               NA       NA
## highest_educationHigh school graduate:income_classmiddle                  0.497    0.6198
## highest_educationLess than high school:income_classmiddle                 1.016    0.3105
## highest_educationProfessional degree:income_classmiddle                   0.473    0.6365
## highest_educationSome college:income_classmiddle                          2.166    0.0312
## highest_education4 year degree:income_classrich                           1.621    0.1061
## highest_educationDoctorate:income_classrich                                 NA       NA
## highest_educationHigh school graduate:income_classrich                      NA       NA
## highest_educationLess than high school:income_classrich                     NA       NA
## highest_educationProfessional degree:income_classrich                       NA       NA
## highest_educationSome college:income_classrich                              NA       NA
##
## (Intercept)                                                 ***
## political_partyMiddle/Independent
## political_partyRight/Republican
## highest_education4 year degree
## highest_educationDoctorate
## highest_educationHigh school graduate
## highest_educationLess than high school
## highest_educationProfessional degree
## highest_educationSome college
## income_classmiddle                                          .
## income_classrich
## highest_education4 year degree:income_classmiddle
## highest_educationDoctorate:income_classmiddle
## highest_educationHigh school graduate:income_classmiddle
## highest_educationLess than high school:income_classmiddle
## highest_educationProfessional degree:income_classmiddle
## highest_educationSome college:income_classmiddle            *
## highest_education4 year degree:income_classrich
## highest_educationDoctorate:income_classrich
## highest_educationHigh school graduate:income_classrich
## highest_educationLess than high school:income_classrich
## highest_educationProfessional degree:income_classrich
## highest_educationSome college:income_classrich
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 23.69 on 278 degrees of freedom
## Multiple R-squared:  0.07407,    Adjusted R-squared:  0.02078
## F-statistic:  1.39 on 16 and 278 DF,  p-value: 0.1456
```

There should not be any difference between control and treatment for this particular question because the
question is the same. However, there is a significance at the 0.05 level among subjects who attain some college

degree and are in the middle class. They have a positive outlook of education in preparing students to enter the workforce by an additional 21 points in the optimistic scale from 1 - 100, where 1 is not optimistic and 100 is very optimistic. We wonder if it was partially due to the residual effect from the first question having the treatment onto the baseline.

Employment

block: political_party covariate: employment_status + income_class interaction term: employment_status * income_class

```
# control
control %>%
  lm(control_employment ~ political_party + employment_status + income +
                          employment_status * income,
     data = .) %>%
  # coeftest(., vcovHC(.))
  summary(.)
```

```
##
## Call:
## lm(formula = control_employment ~ political_party + employment_status +
##      income + employment_status * income, data = .)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -68.11 -11.31   0.00  13.87  47.78
##
## Coefficients: (89 not defined because of singularities)
##                                                         Estimate
## (Intercept)                                            4.746e+01
## political_partyLeft/Democrat                          -1.246e+01
## political_partyMiddle/Independent                     -1.376e+01
## political_partyRight/Republican                        3.426e+00
## employment_statusEmployed full time                    1.722e+01
## employment_statusEmployed full time,Employed part time 4.000e+01
## employment_statusEmployed full time,Student            4.100e+01
## employment_statusEmployed part time                    1.457e+01
## employment_statusEmployed part time,Student            6.241e+01
## employment_statusRetired                               1.684e+01
## employment_statusStudent                               2.500e+01
## employment_statusUnemployed looking for work           3.000e+00
## employment_statusUnemployed looking for work,Student   4.000e+01
## employment_statusUnemployed not looking for work       3.865e+01
## income$100,000 - $149,999                              6.352e+00
## income$20,000 - $29,999                                3.920e+01
## income$30,000 - $39,999                               -2.612e+01
## income$40,000 - $49,999                               -2.094e+01
## income$50,000 - $59,999                               -4.000e+01
## income$60,000 - $69,999                                4.642e-01
## income$70,000 - $79,999                               -1.365e+01
## income$80,000 - $89,999                                1.278e+01
## income$90,000 - $99,999                                1.454e+01
## incomeLess than $10,000                               -3.294e-14
## incomeMore than $150,000                              -4.165e+01
## incomeRather not say                                   2.200e+01
```

```
## employment_statusEmployed full time:income$100,000 - $149,999                              -7.008e+00
## employment_statusEmployed full time,Employed part time:income$100,000 - $149,999                   NA
## employment_statusEmployed full time,Student:income$100,000 - $149,999                             NA
## employment_statusEmployed part time:income$100,000 - $149,999                                     NA
## employment_statusEmployed part time,Student:income$100,000 - $149,999                             NA
## employment_statusRetired:income$100,000 - $149,999                                                NA
## employment_statusStudent:income$100,000 - $149,999                                                NA
## employment_statusUnemployed looking for work:income$100,000 - $149,999                            NA
## employment_statusUnemployed looking for work,Student:income$100,000 - $149,999                    NA
## employment_statusUnemployed not looking for work:income$100,000 - $149,999                        NA
## employment_statusEmployed full time:income$20,000 - $29,999                               -3.420e+01
## employment_statusEmployed full time,Employed part time:income$20,000 - $29,999                     NA
## employment_statusEmployed full time,Student:income$20,000 - $29,999                               NA
## employment_statusEmployed part time:income$20,000 - $29,999                               -1.728e+01
## employment_statusEmployed part time,Student:income$20,000 - $29,999                               NA
## employment_statusRetired:income$20,000 - $29,999                                          -5.104e+01
## employment_statusStudent:income$20,000 - $29,999                                          -2.290e+01
## employment_statusUnemployed looking for work:income$20,000 - $29,999                              NA
## employment_statusUnemployed looking for work,Student:income$20,000 - $29,999                      NA
## employment_statusUnemployed not looking for work:income$20,000 - $29,999                          NA
## employment_statusEmployed full time:income$30,000 - $39,999                                3.394e+01
## employment_statusEmployed full time,Employed part time:income$30,000 - $39,999                     NA
## employment_statusEmployed full time,Student:income$30,000 - $39,999                               NA
## employment_statusEmployed part time:income$30,000 - $39,999                                4.655e+01
## employment_statusEmployed part time,Student:income$30,000 - $39,999                               NA
## employment_statusRetired:income$30,000 - $39,999                                          -6.611e+00
## employment_statusStudent:income$30,000 - $39,999                                           4.741e+01
## employment_statusUnemployed looking for work:income$30,000 - $39,999                              NA
## employment_statusUnemployed looking for work,Student:income$30,000 - $39,999                      NA
## employment_statusUnemployed not looking for work:income$30,000 - $39,999                          NA
## employment_statusEmployed full time:income$40,000 - $49,999                                1.816e+01
## employment_statusEmployed full time,Employed part time:income$40,000 - $49,999                     NA
## employment_statusEmployed full time,Student:income$40,000 - $49,999                        6.240e+00
## employment_statusEmployed part time:income$40,000 - $49,999                                1.418e+01
## employment_statusEmployed part time,Student:income$40,000 - $49,999                               NA
## employment_statusRetired:income$40,000 - $49,999                                           2.014e+01
## employment_statusStudent:income$40,000 - $49,999                                                  NA
## employment_statusUnemployed looking for work:income$40,000 - $49,999                              NA
## employment_statusUnemployed looking for work,Student:income$40,000 - $49,999                      NA
## employment_statusUnemployed not looking for work:income$40,000 - $49,999                          NA
## employment_statusEmployed full time:income$50,000 - $59,999                                4.495e+01
## employment_statusEmployed full time,Employed part time:income$50,000 - $59,999                     NA
## employment_statusEmployed full time,Student:income$50,000 - $59,999                               NA
## employment_statusEmployed part time:income$50,000 - $59,999                                2.843e+01
## employment_statusEmployed part time,Student:income$50,000 - $59,999                               NA
## employment_statusRetired:income$50,000 - $59,999                                                  NA
## employment_statusStudent:income$50,000 - $59,999                                                  NA
## employment_statusUnemployed looking for work:income$50,000 - $59,999                              NA
## employment_statusUnemployed looking for work,Student:income$50,000 - $59,999                      NA
## employment_statusUnemployed not looking for work:income$50,000 - $59,999                          NA
## employment_statusEmployed full time:income$60,000 - $69,999                                1.643e+00
## employment_statusEmployed full time,Employed part time:income$60,000 - $69,999                     NA
## employment_statusEmployed full time,Student:income$60,000 - $69,999                               NA
## employment_statusEmployed part time:income$60,000 - $69,999                                1.997e+01
```

```
## employment_statusEmployed part time,Student:income$60,000 - $69,999                              NA
## employment_statusRetired:income$60,000 - $69,999                                          2.181e+01
## employment_statusStudent:income$60,000 - $69,999                                                 NA
## employment_statusUnemployed looking for work:income$60,000 - $69,999                       4.400e+00
## employment_statusUnemployed looking for work,Student:income$60,000 - $69,999                     NA
## employment_statusUnemployed not looking for work:income$60,000 - $69,999                         NA
## employment_statusEmployed full time:income$70,000 - $79,999                                2.755e+01
## employment_statusEmployed full time,Employed part time:income$70,000 - $79,999                   NA
## employment_statusEmployed full time,Student:income$70,000 - $79,999                               NA
## employment_statusEmployed part time:income$70,000 - $79,999                                1.408e+01
## employment_statusEmployed part time,Student:income$70,000 - $79,999                               NA
## employment_statusRetired:income$70,000 - $79,999                                          -8.192e+00
## employment_statusStudent:income$70,000 - $79,999                                                 NA
## employment_statusUnemployed looking for work:income$70,000 - $79,999                             NA
## employment_statusUnemployed looking for work,Student:income$70,000 - $79,999                     NA
## employment_statusUnemployed not looking for work:income$70,000 - $79,999                         NA
## employment_statusEmployed full time:income$80,000 - $89,999                                      NA
## employment_statusEmployed full time,Employed part time:income$80,000 - $89,999                   NA
## employment_statusEmployed full time,Student:income$80,000 - $89,999                               NA
## employment_statusEmployed part time:income$80,000 - $89,999                                      NA
## employment_statusEmployed part time,Student:income$80,000 - $89,999                               NA
## employment_statusRetired:income$80,000 - $89,999                                                 NA
## employment_statusStudent:income$80,000 - $89,999                                                 NA
## employment_statusUnemployed looking for work:income$80,000 - $89,999                             NA
## employment_statusUnemployed looking for work,Student:income$80,000 - $89,999                     NA
## employment_statusUnemployed not looking for work:income$80,000 - $89,999                         NA
## employment_statusEmployed full time:income$90,000 - $99,999                               -1.837e+01
## employment_statusEmployed full time,Employed part time:income$90,000 - $99,999                   NA
## employment_statusEmployed full time,Student:income$90,000 - $99,999                               NA
## employment_statusEmployed part time:income$90,000 - $99,999                                      NA
## employment_statusEmployed part time,Student:income$90,000 - $99,999                               NA
## employment_statusRetired:income$90,000 - $99,999                                                 NA
## employment_statusStudent:income$90,000 - $99,999                                                 NA
## employment_statusUnemployed looking for work:income$90,000 - $99,999                             NA
## employment_statusUnemployed looking for work,Student:income$90,000 - $99,999                     NA
## employment_statusUnemployed not looking for work:income$90,000 - $99,999                         NA
## employment_statusEmployed full time:incomeLess than $10,000                                1.798e+01
## employment_statusEmployed full time,Employed part time:incomeLess than $10,000                   NA
## employment_statusEmployed full time,Student:incomeLess than $10,000                               NA
## employment_statusEmployed part time:incomeLess than $10,000                                1.227e+01
## employment_statusEmployed part time,Student:incomeLess than $10,000                               NA
## employment_statusRetired:incomeLess than $10,000                                                 NA
## employment_statusStudent:incomeLess than $10,000                                          -1.900e+01
## employment_statusUnemployed looking for work:incomeLess than $10,000                       7.656e+00
## employment_statusUnemployed looking for work,Student:incomeLess than $10,000                     NA
## employment_statusUnemployed not looking for work:incomeLess than $10,000                  -2.531e+01
## employment_statusEmployed full time:incomeMore than $150,000                                5.850e+01
## employment_statusEmployed full time,Employed part time:incomeMore than $150,000                  NA
## employment_statusEmployed full time,Student:incomeMore than $150,000                              NA
## employment_statusEmployed part time:incomeMore than $150,000                                      NA
## employment_statusEmployed part time,Student:incomeMore than $150,000                              NA
## employment_statusRetired:incomeMore than $150,000                                                 NA
## employment_statusStudent:incomeMore than $150,000                                          4.265e+01
## employment_statusUnemployed looking for work:incomeMore than $150,000                             NA
```

```
## employment_statusUnemployed looking for work,Student:incomeMore than $150,000            NA
## employment_statusUnemployed not looking for work:incomeMore than $150,000                NA
## employment_statusEmployed full time:incomeRather not say                          -2.862e+01
## employment_statusEmployed full time,Employed part time:incomeRather not say               NA
## employment_statusEmployed full time,Student:incomeRather not say                          NA
## employment_statusEmployed part time:incomeRather not say                                  NA
## employment_statusEmployed part time,Student:incomeRather not say                          NA
## employment_statusRetired:incomeRather not say                                             NA
## employment_statusStudent:incomeRather not say                                             NA
## employment_statusUnemployed looking for work:incomeRather not say                         NA
## employment_statusUnemployed looking for work,Student:incomeRather not say                 NA
## employment_statusUnemployed not looking for work:incomeRather not say                     NA
##                                                                                    Std. Error
## (Intercept)                                                                         2.923e+01
## political_partyLeft/Democrat                                                        1.787e+01
## political_partyMiddle/Independent                                                   1.777e+01
## political_partyRight/Republican                                                     1.781e+01
## employment_statusEmployed full time                                                 2.443e+01
## employment_statusEmployed full time,Employed part time                              2.833e+01
## employment_statusEmployed full time,Student                                         3.272e+01
## employment_statusEmployed part time                                                 2.501e+01
## employment_statusEmployed part time,Student                                         4.826e+01
## employment_statusRetired                                                            2.695e+01
## employment_statusStudent                                                            3.272e+01
## employment_statusUnemployed looking for work                                        2.833e+01
## employment_statusUnemployed looking for work,Student                                2.833e+01
## employment_statusUnemployed not looking for work                                    4.011e+01
## income$100,000 - $149,999                                                           4.011e+01
## income$20,000 - $29,999                                                             2.127e+01
## income$30,000 - $39,999                                                             3.534e+01
## income$40,000 - $49,999                                                             3.664e+01
## income$50,000 - $59,999                                                             3.272e+01
## income$60,000 - $69,999                                                             4.024e+01
## income$70,000 - $79,999                                                             4.011e+01
## income$80,000 - $89,999                                                             1.034e+01
## income$90,000 - $99,999                                                             2.520e+01
## incomeLess than $10,000                                                             2.833e+01
## incomeMore than $150,000                                                            4.011e+01
## incomeRather not say                                                                2.833e+01
## employment_statusEmployed full time:income$100,000 - $149,999                       4.134e+01
## employment_statusEmployed full time,Employed part time:income$100,000 - $149,999           NA
## employment_statusEmployed full time,Student:income$100,000 - $149,999                      NA
## employment_statusEmployed part time:income$100,000 - $149,999                              NA
## employment_statusEmployed part time,Student:income$100,000 - $149,999                      NA
## employment_statusRetired:income$100,000 - $149,999                                         NA
## employment_statusStudent:income$100,000 - $149,999                                         NA
## employment_statusUnemployed looking for work:income$100,000 - $149,999                     NA
## employment_statusUnemployed looking for work,Student:income$100,000 - $149,999             NA
## employment_statusUnemployed not looking for work:income$100,000 - $149,999                 NA
## employment_statusEmployed full time:income$20,000 - $29,999                         2.312e+01
## employment_statusEmployed full time,Employed part time:income$20,000 - $29,999             NA
## employment_statusEmployed full time,Student:income$20,000 - $29,999                        NA
## employment_statusEmployed part time:income$20,000 - $29,999                         2.463e+01
## employment_statusEmployed part time,Student:income$20,000 - $29,999                        NA
```

```
## employment_statusRetired:income$20,000 - $29,999                                       3.452e+01
## employment_statusStudent:income$20,000 - $29,999                                        3.896e+01
## employment_statusUnemployed looking for work:income$20,000 - $29,999                            NA
## employment_statusUnemployed looking for work,Student:income$20,000 - $29,999                    NA
## employment_statusUnemployed not looking for work:income$20,000 - $29,999                        NA
## employment_statusEmployed full time:income$30,000 - $39,999                             3.653e+01
## employment_statusEmployed full time,Employed part time:income$30,000 - $39,999                  NA
## employment_statusEmployed full time,Student:income$30,000 - $39,999                             NA
## employment_statusEmployed part time:income$30,000 - $39,999                             4.331e+01
## employment_statusEmployed part time,Student:income$30,000 - $39,999                             NA
## employment_statusRetired:income$30,000 - $39,999                                       4.433e+01
## employment_statusStudent:income$30,000 - $39,999                                        4.826e+01
## employment_statusUnemployed looking for work:income$30,000 - $39,999                            NA
## employment_statusUnemployed looking for work,Student:income$30,000 - $39,999                    NA
## employment_statusUnemployed not looking for work:income$30,000 - $39,999                        NA
## employment_statusEmployed full time:income$40,000 - $49,999                             3.774e+01
## employment_statusEmployed full time,Employed part time:income$40,000 - $49,999                  NA
## employment_statusEmployed full time,Student:income$40,000 - $49,999                     4.919e+01
## employment_statusEmployed part time:income$40,000 - $49,999                             4.009e+01
## employment_statusEmployed part time,Student:income$40,000 - $49,999                             NA
## employment_statusRetired:income$40,000 - $49,999                                       4.139e+01
## employment_statusStudent:income$40,000 - $49,999                                                NA
## employment_statusUnemployed looking for work:income$40,000 - $49,999                            NA
## employment_statusUnemployed looking for work,Student:income$40,000 - $49,999                    NA
## employment_statusUnemployed not looking for work:income$40,000 - $49,999                        NA
## employment_statusEmployed full time:income$50,000 - $59,999                             3.396e+01
## employment_statusEmployed full time,Employed part time:income$50,000 - $59,999                  NA
## employment_statusEmployed full time,Student:income$50,000 - $59,999                              NA
## employment_statusEmployed part time:income$50,000 - $59,999                             4.118e+01
## employment_statusEmployed part time,Student:income$50,000 - $59,999                              NA
## employment_statusRetired:income$50,000 - $59,999                                                NA
## employment_statusStudent:income$50,000 - $59,999                                                NA
## employment_statusUnemployed looking for work:income$50,000 - $59,999                            NA
## employment_statusUnemployed looking for work,Student:income$50,000 - $59,999                    NA
## employment_statusUnemployed not looking for work:income$50,000 - $59,999                        NA
## employment_statusEmployed full time:income$60,000 - $69,999                             4.129e+01
## employment_statusEmployed full time,Employed part time:income$60,000 - $69,999                  NA
## employment_statusEmployed full time,Student:income$60,000 - $69,999                              NA
## employment_statusEmployed part time:income$60,000 - $69,999                             4.744e+01
## employment_statusEmployed part time,Student:income$60,000 - $69,999                              NA
## employment_statusRetired:income$60,000 - $69,999                                       4.823e+01
## employment_statusStudent:income$60,000 - $69,999                                                NA
## employment_statusUnemployed looking for work:income$60,000 - $69,999                    3.919e+01
## employment_statusUnemployed looking for work,Student:income$60,000 - $69,999                    NA
## employment_statusUnemployed not looking for work:income$60,000 - $69,999                        NA
## employment_statusEmployed full time:income$70,000 - $79,999                             4.135e+01
## employment_statusEmployed full time,Employed part time:income$70,000 - $79,999                  NA
## employment_statusEmployed full time,Student:income$70,000 - $79,999                              NA
## employment_statusEmployed part time:income$70,000 - $79,999                             4.723e+01
## employment_statusEmployed part time,Student:income$70,000 - $79,999                              NA
## employment_statusRetired:income$70,000 - $79,999                                       4.823e+01
## employment_statusStudent:income$70,000 - $79,999                                                NA
## employment_statusUnemployed looking for work:income$70,000 - $79,999                            NA
## employment_statusUnemployed looking for work,Student:income$70,000 - $79,999                    NA
```

```
## employment_statusUnemployed not looking for work:income$70,000 - $79,999             NA
## employment_statusEmployed full time:income$80,000 - $89,999                           NA
## employment_statusEmployed full time,Employed part time:income$80,000 - $89,999        NA
## employment_statusEmployed full time,Student:income$80,000 - $89,999                   NA
## employment_statusEmployed part time:income$80,000 - $89,999                           NA
## employment_statusEmployed part time,Student:income$80,000 - $89,999                   NA
## employment_statusRetired:income$80,000 - $89,999                                      NA
## employment_statusStudent:income$80,000 - $89,999                                      NA
## employment_statusUnemployed looking for work:income$80,000 - $89,999                  NA
## employment_statusUnemployed looking for work,Student:income$80,000 - $89,999          NA
## employment_statusUnemployed not looking for work:income$80,000 - $89,999              NA
## employment_statusEmployed full time:income$90,000 - $99,999                        2.800e+01
## employment_statusEmployed full time,Employed part time:income$90,000 - $99,999        NA
## employment_statusEmployed full time,Student:income$90,000 - $99,999                   NA
## employment_statusEmployed part time:income$90,000 - $99,999                           NA
## employment_statusEmployed part time,Student:income$90,000 - $99,999                   NA
## employment_statusRetired:income$90,000 - $99,999                                      NA
## employment_statusStudent:income$90,000 - $99,999                                      NA
## employment_statusUnemployed looking for work:income$90,000 - $99,999                  NA
## employment_statusUnemployed looking for work,Student:income$90,000 - $99,999          NA
## employment_statusUnemployed not looking for work:income$90,000 - $99,999              NA
## employment_statusEmployed full time:incomeLess than $10,000                        3.367e+01
## employment_statusEmployed full time,Employed part time:incomeLess than $10,000         NA
## employment_statusEmployed full time,Student:incomeLess than $10,000                    NA
## employment_statusEmployed part time:incomeLess than $10,000                        3.135e+01
## employment_statusEmployed part time,Student:incomeLess than $10,000                    NA
## employment_statusRetired:incomeLess than $10,000                                       NA
## employment_statusStudent:incomeLess than $10,000                                   4.007e+01
## employment_statusUnemployed looking for work:incomeLess than $10,000               3.400e+01
## employment_statusUnemployed looking for work,Student:incomeLess than $10,000           NA
## employment_statusUnemployed not looking for work:incomeLess than $10,000           4.430e+01
## employment_statusEmployed full time:incomeMore than $150,000                       4.238e+01
## employment_statusEmployed full time,Employed part time:incomeMore than $150,000        NA
## employment_statusEmployed full time,Student:incomeMore than $150,000                   NA
## employment_statusEmployed part time:incomeMore than $150,000                           NA
## employment_statusEmployed part time,Student:incomeMore than $150,000                   NA
## employment_statusRetired:incomeMore than $150,000                                      NA
## employment_statusStudent:incomeMore than $150,000                                  5.176e+01
## employment_statusUnemployed looking for work:incomeMore than $150,000                  NA
## employment_statusUnemployed looking for work,Student:incomeMore than $150,000          NA
## employment_statusUnemployed not looking for work:incomeMore than $150,000              NA
## employment_statusEmployed full time:incomeRather not say                           3.156e+01
## employment_statusEmployed full time,Employed part time:incomeRather not say             NA
## employment_statusEmployed full time,Student:incomeRather not say                       NA
## employment_statusEmployed part time:incomeRather not say                               NA
## employment_statusEmployed part time,Student:incomeRather not say                       NA
## employment_statusRetired:incomeRather not say                                          NA
## employment_statusStudent:incomeRather not say                                          NA
## employment_statusUnemployed looking for work:incomeRather not say                      NA
## employment_statusUnemployed looking for work,Student:incomeRather not say               NA
## employment_statusUnemployed not looking for work:incomeRather not say                  NA
##                                                                                    t value
## (Intercept)                                                                         1.624
## political_partyLeft/Democrat                                                       -0.697
```

```
## political_partyMiddle/Independent                                                 -0.774
## political_partyRight/Republican                                                    0.192
## employment_statusEmployed full time                                                0.705
## employment_statusEmployed full time,Employed part time                             1.412
## employment_statusEmployed full time,Student                                        1.253
## employment_statusEmployed part time                                                0.582
## employment_statusEmployed part time,Student                                        1.293
## employment_statusRetired                                                           0.625
## employment_statusStudent                                                           0.764
## employment_statusUnemployed looking for work                                       0.106
## employment_statusUnemployed looking for work,Student                               1.412
## employment_statusUnemployed not looking for work                                   0.963
## income$100,000 - $149,999                                                          0.158
## income$20,000 - $29,999                                                            1.843
## income$30,000 - $39,999                                                           -0.739
## income$40,000 - $49,999                                                           -0.572
## income$50,000 - $59,999                                                           -1.223
## income$60,000 - $69,999                                                            0.012
## income$70,000 - $79,999                                                           -0.340
## income$80,000 - $89,999                                                            1.237
## income$90,000 - $99,999                                                            0.577
## incomeLess than $10,000                                                            0.000
## incomeMore than $150,000                                                          -1.038
## incomeRather not say                                                               0.776
## employment_statusEmployed full time:income$100,000 - $149,999                     -0.170
## employment_statusEmployed full time,Employed part time:income$100,000 - $149,999     NA
## employment_statusEmployed full time,Student:income$100,000 - $149,999               NA
## employment_statusEmployed part time:income$100,000 - $149,999                       NA
## employment_statusEmployed part time,Student:income$100,000 - $149,999               NA
## employment_statusRetired:income$100,000 - $149,999                                  NA
## employment_statusStudent:income$100,000 - $149,999                                  NA
## employment_statusUnemployed looking for work:income$100,000 - $149,999              NA
## employment_statusUnemployed looking for work,Student:income$100,000 - $149,999       NA
## employment_statusUnemployed not looking for work:income$100,000 - $149,999          NA
## employment_statusEmployed full time:income$20,000 - $29,999                        -1.479
## employment_statusEmployed full time,Employed part time:income$20,000 - $29,999       NA
## employment_statusEmployed full time,Student:income$20,000 - $29,999                  NA
## employment_statusEmployed part time:income$20,000 - $29,999                        -0.702
## employment_statusEmployed part time,Student:income$20,000 - $29,999                  NA
## employment_statusRetired:income$20,000 - $29,999                                   -1.478
## employment_statusStudent:income$20,000 - $29,999                                   -0.588
## employment_statusUnemployed looking for work:income$20,000 - $29,999                 NA
## employment_statusUnemployed looking for work,Student:income$20,000 - $29,999         NA
## employment_statusUnemployed not looking for work:income$20,000 - $29,999            NA
## employment_statusEmployed full time:income$30,000 - $39,999                         0.929
## employment_statusEmployed full time,Employed part time:income$30,000 - $39,999       NA
## employment_statusEmployed full time,Student:income$30,000 - $39,999                  NA
## employment_statusEmployed part time:income$30,000 - $39,999                         1.075
## employment_statusEmployed part time,Student:income$30,000 - $39,999                  NA
## employment_statusRetired:income$30,000 - $39,999                                   -0.149
## employment_statusStudent:income$30,000 - $39,999                                    0.983
## employment_statusUnemployed looking for work:income$30,000 - $39,999                 NA
## employment_statusUnemployed looking for work,Student:income$30,000 - $39,999         NA
## employment_statusUnemployed not looking for work:income$30,000 - $39,999            NA
```

```
## employment_statusEmployed full time:income$40,000 - $49,999                                    0.481
## employment_statusEmployed full time,Employed part time:income$40,000 - $49,999                   NA
## employment_statusEmployed full time,Student:income$40,000 - $49,999                             0.127
## employment_statusEmployed part time:income$40,000 - $49,999                                     0.354
## employment_statusEmployed part time,Student:income$40,000 - $49,999                               NA
## employment_statusRetired:income$40,000 - $49,999                                                0.487
## employment_statusStudent:income$40,000 - $49,999                                                  NA
## employment_statusUnemployed looking for work:income$40,000 - $49,999                              NA
## employment_statusUnemployed looking for work,Student:income$40,000 - $49,999                      NA
## employment_statusUnemployed not looking for work:income$40,000 - $49,999                          NA
## employment_statusEmployed full time:income$50,000 - $59,999                                    1.324
## employment_statusEmployed full time,Employed part time:income$50,000 - $59,999                   NA
## employment_statusEmployed full time,Student:income$50,000 - $59,999                               NA
## employment_statusEmployed part time:income$50,000 - $59,999                                     0.690
## employment_statusEmployed part time,Student:income$50,000 - $59,999                               NA
## employment_statusRetired:income$50,000 - $59,999                                                  NA
## employment_statusStudent:income$50,000 - $59,999                                                  NA
## employment_statusUnemployed looking for work:income$50,000 - $59,999                              NA
## employment_statusUnemployed looking for work,Student:income$50,000 - $59,999                      NA
## employment_statusUnemployed not looking for work:income$50,000 - $59,999                          NA
## employment_statusEmployed full time:income$60,000 - $69,999                                    0.040
## employment_statusEmployed full time,Employed part time:income$60,000 - $69,999                   NA
## employment_statusEmployed full time,Student:income$60,000 - $69,999                               NA
## employment_statusEmployed part time:income$60,000 - $69,999                                     0.421
## employment_statusEmployed part time,Student:income$60,000 - $69,999                               NA
## employment_statusRetired:income$60,000 - $69,999                                                0.452
## employment_statusStudent:income$60,000 - $69,999                                                  NA
## employment_statusUnemployed looking for work:income$60,000 - $69,999                            0.112
## employment_statusUnemployed looking for work,Student:income$60,000 - $69,999                      NA
## employment_statusUnemployed not looking for work:income$60,000 - $69,999                          NA
## employment_statusEmployed full time:income$70,000 - $79,999                                    0.666
## employment_statusEmployed full time,Employed part time:income$70,000 - $79,999                   NA
## employment_statusEmployed full time,Student:income$70,000 - $79,999                               NA
## employment_statusEmployed part time:income$70,000 - $79,999                                     0.298
## employment_statusEmployed part time,Student:income$70,000 - $79,999                               NA
## employment_statusRetired:income$70,000 - $79,999                                               -0.170
## employment_statusStudent:income$70,000 - $79,999                                                  NA
## employment_statusUnemployed looking for work:income$70,000 - $79,999                              NA
## employment_statusUnemployed looking for work,Student:income$70,000 - $79,999                      NA
## employment_statusUnemployed not looking for work:income$70,000 - $79,999                          NA
## employment_statusEmployed full time:income$80,000 - $89,999                                       NA
## employment_statusEmployed full time,Employed part time:income$80,000 - $89,999                   NA
## employment_statusEmployed full time,Student:income$80,000 - $89,999                               NA
## employment_statusEmployed part time:income$80,000 - $89,999                                       NA
## employment_statusEmployed part time,Student:income$80,000 - $89,999                               NA
## employment_statusRetired:income$80,000 - $89,999                                                  NA
## employment_statusStudent:income$80,000 - $89,999                                                  NA
## employment_statusUnemployed looking for work:income$80,000 - $89,999                              NA
## employment_statusUnemployed looking for work,Student:income$80,000 - $89,999                      NA
## employment_statusUnemployed not looking for work:income$80,000 - $89,999                          NA
## employment_statusEmployed full time:income$90,000 - $99,999                                   -0.656
## employment_statusEmployed full time,Employed part time:income$90,000 - $99,999                   NA
## employment_statusEmployed full time,Student:income$90,000 - $99,999                               NA
## employment_statusEmployed part time:income$90,000 - $99,999                                       NA
```

```
## employment_statusEmployed part time,Student:income$90,000 - $99,999                                 NA
## employment_statusRetired:income$90,000 - $99,999                                                     NA
## employment_statusStudent:income$90,000 - $99,999                                                     NA
## employment_statusUnemployed looking for work:income$90,000 - $99,999                                 NA
## employment_statusUnemployed looking for work,Student:income$90,000 - $99,999                         NA
## employment_statusUnemployed not looking for work:income$90,000 - $99,999                             NA
## employment_statusEmployed full time:incomeLess than $10,000                                       0.534
## employment_statusEmployed full time,Employed part time:incomeLess than $10,000                       NA
## employment_statusEmployed full time,Student:incomeLess than $10,000                                  NA
## employment_statusEmployed part time:incomeLess than $10,000                                       0.391
## employment_statusEmployed part time,Student:incomeLess than $10,000                                  NA
## employment_statusRetired:incomeLess than $10,000                                                     NA
## employment_statusStudent:incomeLess than $10,000                                                 -0.474
## employment_statusUnemployed looking for work:incomeLess than $10,000                              0.225
## employment_statusUnemployed looking for work,Student:incomeLess than $10,000                         NA
## employment_statusUnemployed not looking for work:incomeLess than $10,000                          -0.571
## employment_statusEmployed full time:incomeMore than $150,000                                      1.380
## employment_statusEmployed full time,Employed part time:incomeMore than $150,000                      NA
## employment_statusEmployed full time,Student:incomeMore than $150,000                                 NA
## employment_statusEmployed part time:incomeMore than $150,000                                         NA
## employment_statusEmployed part time,Student:incomeMore than $150,000                                 NA
## employment_statusRetired:incomeMore than $150,000                                                    NA
## employment_statusStudent:incomeMore than $150,000                                                 0.824
## employment_statusUnemployed looking for work:incomeMore than $150,000                                NA
## employment_statusUnemployed looking for work,Student:incomeMore than $150,000                        NA
## employment_statusUnemployed not looking for work:incomeMore than $150,000                            NA
## employment_statusEmployed full time:incomeRather not say                                          -0.907
## employment_statusEmployed full time,Employed part time:incomeRather not say                          NA
## employment_statusEmployed full time,Student:incomeRather not say                                     NA
## employment_statusEmployed part time:incomeRather not say                                             NA
## employment_statusEmployed part time,Student:incomeRather not say                                     NA
## employment_statusRetired:incomeRather not say                                                        NA
## employment_statusStudent:incomeRather not say                                                        NA
## employment_statusUnemployed looking for work:incomeRather not say                                    NA
## employment_statusUnemployed looking for work,Student:incomeRather not say                            NA
## employment_statusUnemployed not looking for work:incomeRather not say                                NA
##                                                                                                 Pr(>|t|)
## (Intercept)                                                                                       0.1060
## political_partyLeft/Democrat                                                                      0.4864
## political_partyMiddle/Independent                                                                 0.4396
## political_partyRight/Republican                                                                   0.8477
## employment_statusEmployed full time                                                               0.4817
## employment_statusEmployed full time,Employed part time                                            0.1595
## employment_statusEmployed full time,Student                                                       0.2115
## employment_statusEmployed part time                                                               0.5609
## employment_statusEmployed part time,Student                                                       0.1974
## employment_statusRetired                                                                          0.5328
## employment_statusStudent                                                                          0.4456
## employment_statusUnemployed looking for work                                                      0.9158
## employment_statusUnemployed looking for work,Student                                              0.1595
## employment_statusUnemployed not looking for work                                                  0.3364
## income$100,000 - $149,999                                                                         0.8743
## income$20,000 - $29,999                                                                           0.0667
## income$30,000 - $39,999                                                                           0.4608
```

```
## income$40,000 - $49,999                                                               0.5682
## income$50,000 - $59,999                                                               0.2229
## income$60,000 - $69,999                                                               0.9908
## income$70,000 - $79,999                                                               0.7340
## income$80,000 - $89,999                                                               0.2177
## income$90,000 - $99,999                                                               0.5645
## incomeLess than $10,000                                                               1.0000
## incomeMore than $150,000                                                              0.3004
## incomeRather not say                                                                  0.4384
## employment_statusEmployed full time:income$100,000 - $149,999                         0.8656
## employment_statusEmployed full time,Employed part time:income$100,000 - $149,999        NA
## employment_statusEmployed full time,Student:income$100,000 - $149,999                    NA
## employment_statusEmployed part time:income$100,000 - $149,999                            NA
## employment_statusEmployed part time,Student:income$100,000 - $149,999                    NA
## employment_statusRetired:income$100,000 - $149,999                                       NA
## employment_statusStudent:income$100,000 - $149,999                                       NA
## employment_statusUnemployed looking for work:income$100,000 - $149,999                   NA
## employment_statusUnemployed looking for work,Student:income$100,000 - $149,999           NA
## employment_statusUnemployed not looking for work:income$100,000 - $149,999               NA
## employment_statusEmployed full time:income$20,000 - $29,999                           0.1407
## employment_statusEmployed full time,Employed part time:income$20,000 - $29,999           NA
## employment_statusEmployed full time,Student:income$20,000 - $29,999                      NA
## employment_statusEmployed part time:income$20,000 - $29,999                           0.4838
## employment_statusEmployed part time,Student:income$20,000 - $29,999                      NA
## employment_statusRetired:income$20,000 - $29,999                                      0.1408
## employment_statusStudent:income$20,000 - $29,999                                      0.5573
## employment_statusUnemployed looking for work:income$20,000 - $29,999                     NA
## employment_statusUnemployed looking for work,Student:income$20,000 - $29,999             NA
## employment_statusUnemployed not looking for work:income$20,000 - $29,999                 NA
## employment_statusEmployed full time:income$30,000 - $39,999                           0.3540
## employment_statusEmployed full time,Employed part time:income$30,000 - $39,999           NA
## employment_statusEmployed full time,Student:income$30,000 - $39,999                      NA
## employment_statusEmployed part time:income$30,000 - $39,999                           0.2838
## employment_statusEmployed part time,Student:income$30,000 - $39,999                      NA
## employment_statusRetired:income$30,000 - $39,999                                      0.8816
## employment_statusStudent:income$30,000 - $39,999                                      0.3270
## employment_statusUnemployed looking for work:income$30,000 - $39,999                     NA
## employment_statusUnemployed looking for work,Student:income$30,000 - $39,999             NA
## employment_statusUnemployed not looking for work:income$30,000 - $39,999                 NA
## employment_statusEmployed full time:income$40,000 - $49,999                           0.6308
## employment_statusEmployed full time,Employed part time:income$40,000 - $49,999           NA
## employment_statusEmployed full time,Student:income$40,000 - $49,999                   0.8992
## employment_statusEmployed part time:income$40,000 - $49,999                           0.7239
## employment_statusEmployed part time,Student:income$40,000 - $49,999                      NA
## employment_statusRetired:income$40,000 - $49,999                                      0.6270
## employment_statusStudent:income$40,000 - $49,999                                         NA
## employment_statusUnemployed looking for work:income$40,000 - $49,999                     NA
## employment_statusUnemployed looking for work,Student:income$40,000 - $49,999             NA
## employment_statusUnemployed not looking for work:income$40,000 - $49,999                 NA
## employment_statusEmployed full time:income$50,000 - $59,999                           0.1871
## employment_statusEmployed full time,Employed part time:income$50,000 - $59,999           NA
## employment_statusEmployed full time,Student:income$50,000 - $59,999                      NA
## employment_statusEmployed part time:income$50,000 - $59,999                           0.4907
## employment_statusEmployed part time,Student:income$50,000 - $59,999                      NA
```

```
## employment_statusRetired:income$50,000 - $59,999                                        NA
## employment_statusStudent:income$50,000 - $59,999                                        NA
## employment_statusUnemployed looking for work:income$50,000 - $59,999                     NA
## employment_statusUnemployed looking for work,Student:income$50,000 - $59,999             NA
## employment_statusUnemployed not looking for work:income$50,000 - $59,999                 NA
## employment_statusEmployed full time:income$60,000 - $69,999                          0.9683
## employment_statusEmployed full time,Employed part time:income$60,000 - $69,999           NA
## employment_statusEmployed full time,Student:income$60,000 - $69,999                      NA
## employment_statusEmployed part time:income$60,000 - $69,999                          0.6742
## employment_statusEmployed part time,Student:income$60,000 - $69,999                      NA
## employment_statusRetired:income$60,000 - $69,999                                     0.6516
## employment_statusStudent:income$60,000 - $69,999                                        NA
## employment_statusUnemployed looking for work:income$60,000 - $69,999                 0.9107
## employment_statusUnemployed looking for work,Student:income$60,000 - $69,999             NA
## employment_statusUnemployed not looking for work:income$60,000 - $69,999                 NA
## employment_statusEmployed full time:income$70,000 - $79,999                          0.5060
## employment_statusEmployed full time,Employed part time:income$70,000 - $79,999           NA
## employment_statusEmployed full time,Student:income$70,000 - $79,999                      NA
## employment_statusEmployed part time:income$70,000 - $79,999                          0.7659
## employment_statusEmployed part time,Student:income$70,000 - $79,999                      NA
## employment_statusRetired:income$70,000 - $79,999                                     0.8653
## employment_statusStudent:income$70,000 - $79,999                                        NA
## employment_statusUnemployed looking for work:income$70,000 - $79,999                     NA
## employment_statusUnemployed looking for work,Student:income$70,000 - $79,999             NA
## employment_statusUnemployed not looking for work:income$70,000 - $79,999                 NA
## employment_statusEmployed full time:income$80,000 - $89,999                              NA
## employment_statusEmployed full time,Employed part time:income$80,000 - $89,999           NA
## employment_statusEmployed full time,Student:income$80,000 - $89,999                      NA
## employment_statusEmployed part time:income$80,000 - $89,999                              NA
## employment_statusEmployed part time,Student:income$80,000 - $89,999                      NA
## employment_statusRetired:income$80,000 - $89,999                                        NA
## employment_statusStudent:income$80,000 - $89,999                                        NA
## employment_statusUnemployed looking for work:income$80,000 - $89,999                     NA
## employment_statusUnemployed looking for work,Student:income$80,000 - $89,999             NA
## employment_statusUnemployed not looking for work:income$80,000 - $89,999                 NA
## employment_statusEmployed full time:income$90,000 - $99,999                          0.5126
## employment_statusEmployed full time,Employed part time:income$90,000 - $99,999           NA
## employment_statusEmployed full time,Student:income$90,000 - $99,999                      NA
## employment_statusEmployed part time:income$90,000 - $99,999                              NA
## employment_statusEmployed part time,Student:income$90,000 - $99,999                      NA
## employment_statusRetired:income$90,000 - $99,999                                        NA
## employment_statusStudent:income$90,000 - $99,999                                        NA
## employment_statusUnemployed looking for work:income$90,000 - $99,999                     NA
## employment_statusUnemployed looking for work,Student:income$90,000 - $99,999             NA
## employment_statusUnemployed not looking for work:income$90,000 - $99,999                 NA
## employment_statusEmployed full time:incomeLess than $10,000                          0.5939
## employment_statusEmployed full time,Employed part time:incomeLess than $10,000           NA
## employment_statusEmployed full time,Student:incomeLess than $10,000                      NA
## employment_statusEmployed part time:incomeLess than $10,000                          0.6960
## employment_statusEmployed part time,Student:incomeLess than $10,000                      NA
## employment_statusRetired:incomeLess than $10,000                                        NA
## employment_statusStudent:incomeLess than $10,000                                     0.6359
## employment_statusUnemployed looking for work:incomeLess than $10,000                 0.8221
## employment_statusUnemployed looking for work,Student:incomeLess than $10,000             NA
```

```
## employment_statusUnemployed not looking for work:incomeLess than $10,000        0.5684
## employment_statusEmployed full time:incomeMore than $150,000                      0.1690
## employment_statusEmployed full time,Employed part time:incomeMore than $150,000      NA
## employment_statusEmployed full time,Student:incomeMore than $150,000                 NA
## employment_statusEmployed part time:incomeMore than $150,000                         NA
## employment_statusEmployed part time,Student:incomeMore than $150,000                 NA
## employment_statusRetired:incomeMore than $150,000                                    NA
## employment_statusStudent:incomeMore than $150,000                                 0.4109
## employment_statusUnemployed looking for work:incomeMore than $150,000                NA
## employment_statusUnemployed looking for work,Student:incomeMore than $150,000         NA
## employment_statusUnemployed not looking for work:incomeMore than $150,000            NA
## employment_statusEmployed full time:incomeRather not say                          0.3656
## employment_statusEmployed full time,Employed part time:incomeRather not say           NA
## employment_statusEmployed full time,Student:incomeRather not say                      NA
## employment_statusEmployed part time:incomeRather not say                             NA
## employment_statusEmployed part time,Student:incomeRather not say                      NA
## employment_statusRetired:incomeRather not say                                        NA
## employment_statusStudent:incomeRather not say                                        NA
## employment_statusUnemployed looking for work:incomeRather not say                    NA
## employment_statusUnemployed looking for work,Student:incomeRather not say            NA
## employment_statusUnemployed not looking for work:incomeRather not say                NA
## 
## (Intercept)
## political_partyLeft/Democrat
## political_partyMiddle/Independent
## political_partyRight/Republican
## employment_statusEmployed full time
## employment_statusEmployed full time,Employed part time
## employment_statusEmployed full time,Student
## employment_statusEmployed part time
## employment_statusEmployed part time,Student
## employment_statusRetired
## employment_statusStudent
## employment_statusUnemployed looking for work
## employment_statusUnemployed looking for work,Student
## employment_statusUnemployed not looking for work
## income$100,000 - $149,999
## income$20,000 - $29,999                                                              .
## income$30,000 - $39,999
## income$40,000 - $49,999
## income$50,000 - $59,999
## income$60,000 - $69,999
## income$70,000 - $79,999
## income$80,000 - $89,999
## income$90,000 - $99,999
## incomeLess than $10,000
## incomeMore than $150,000
## incomeRather not say
## employment_statusEmployed full time:income$100,000 - $149,999
## employment_statusEmployed full time,Employed part time:income$100,000 - $149,999
## employment_statusEmployed full time,Student:income$100,000 - $149,999
## employment_statusEmployed part time:income$100,000 - $149,999
## employment_statusEmployed part time,Student:income$100,000 - $149,999
## employment_statusRetired:income$100,000 - $149,999
```

```
## employment_statusStudent:income$100,000 - $149,999
## employment_statusUnemployed looking for work:income$100,000 - $149,999
## employment_statusUnemployed looking for work,Student:income$100,000 - $149,999
## employment_statusUnemployed not looking for work:income$100,000 - $149,999
## employment_statusEmployed full time:income$20,000 - $29,999
## employment_statusEmployed full time,Employed part time:income$20,000 - $29,999
## employment_statusEmployed full time,Student:income$20,000 - $29,999
## employment_statusEmployed part time:income$20,000 - $29,999
## employment_statusEmployed part time,Student:income$20,000 - $29,999
## employment_statusRetired:income$20,000 - $29,999
## employment_statusStudent:income$20,000 - $29,999
## employment_statusUnemployed looking for work:income$20,000 - $29,999
## employment_statusUnemployed looking for work,Student:income$20,000 - $29,999
## employment_statusUnemployed not looking for work:income$20,000 - $29,999
## employment_statusEmployed full time:income$30,000 - $39,999
## employment_statusEmployed full time,Employed part time:income$30,000 - $39,999
## employment_statusEmployed full time,Student:income$30,000 - $39,999
## employment_statusEmployed part time:income$30,000 - $39,999
## employment_statusEmployed part time,Student:income$30,000 - $39,999
## employment_statusRetired:income$30,000 - $39,999
## employment_statusStudent:income$30,000 - $39,999
## employment_statusUnemployed looking for work:income$30,000 - $39,999
## employment_statusUnemployed looking for work,Student:income$30,000 - $39,999
## employment_statusUnemployed not looking for work:income$30,000 - $39,999
## employment_statusEmployed full time:income$40,000 - $49,999
## employment_statusEmployed full time,Employed part time:income$40,000 - $49,999
## employment_statusEmployed full time,Student:income$40,000 - $49,999
## employment_statusEmployed part time:income$40,000 - $49,999
## employment_statusEmployed part time,Student:income$40,000 - $49,999
## employment_statusRetired:income$40,000 - $49,999
## employment_statusStudent:income$40,000 - $49,999
## employment_statusUnemployed looking for work:income$40,000 - $49,999
## employment_statusUnemployed looking for work,Student:income$40,000 - $49,999
## employment_statusUnemployed not looking for work:income$40,000 - $49,999
## employment_statusEmployed full time:income$50,000 - $59,999
## employment_statusEmployed full time,Employed part time:income$50,000 - $59,999
## employment_statusEmployed full time,Student:income$50,000 - $59,999
## employment_statusEmployed part time:income$50,000 - $59,999
## employment_statusEmployed part time,Student:income$50,000 - $59,999
## employment_statusRetired:income$50,000 - $59,999
## employment_statusStudent:income$50,000 - $59,999
## employment_statusUnemployed looking for work:income$50,000 - $59,999
## employment_statusUnemployed looking for work,Student:income$50,000 - $59,999
## employment_statusUnemployed not looking for work:income$50,000 - $59,999
## employment_statusEmployed full time:income$60,000 - $69,999
## employment_statusEmployed full time,Employed part time:income$60,000 - $69,999
## employment_statusEmployed full time,Student:income$60,000 - $69,999
## employment_statusEmployed part time:income$60,000 - $69,999
## employment_statusEmployed part time,Student:income$60,000 - $69,999
## employment_statusRetired:income$60,000 - $69,999
## employment_statusStudent:income$60,000 - $69,999
## employment_statusUnemployed looking for work:income$60,000 - $69,999
## employment_statusUnemployed looking for work,Student:income$60,000 - $69,999
## employment_statusUnemployed not looking for work:income$60,000 - $69,999
```

```
## employment_statusEmployed full time:income$70,000 - $79,999
## employment_statusEmployed full time,Employed part time:income$70,000 - $79,999
## employment_statusEmployed full time,Student:income$70,000 - $79,999
## employment_statusEmployed part time:income$70,000 - $79,999
## employment_statusEmployed part time,Student:income$70,000 - $79,999
## employment_statusRetired:income$70,000 - $79,999
## employment_statusStudent:income$70,000 - $79,999
## employment_statusUnemployed looking for work:income$70,000 - $79,999
## employment_statusUnemployed looking for work,Student:income$70,000 - $79,999
## employment_statusUnemployed not looking for work:income$70,000 - $79,999
## employment_statusEmployed full time:income$80,000 - $89,999
## employment_statusEmployed full time,Employed part time:income$80,000 - $89,999
## employment_statusEmployed full time,Student:income$80,000 - $89,999
## employment_statusEmployed part time:income$80,000 - $89,999
## employment_statusEmployed part time,Student:income$80,000 - $89,999
## employment_statusRetired:income$80,000 - $89,999
## employment_statusStudent:income$80,000 - $89,999
## employment_statusUnemployed looking for work:income$80,000 - $89,999
## employment_statusUnemployed looking for work,Student:income$80,000 - $89,999
## employment_statusUnemployed not looking for work:income$80,000 - $89,999
## employment_statusEmployed full time:income$90,000 - $99,999
## employment_statusEmployed full time,Employed part time:income$90,000 - $99,999
## employment_statusEmployed full time,Student:income$90,000 - $99,999
## employment_statusEmployed part time:income$90,000 - $99,999
## employment_statusEmployed part time,Student:income$90,000 - $99,999
## employment_statusRetired:income$90,000 - $99,999
## employment_statusStudent:income$90,000 - $99,999
## employment_statusUnemployed looking for work:income$90,000 - $99,999
## employment_statusUnemployed looking for work,Student:income$90,000 - $99,999
## employment_statusUnemployed not looking for work:income$90,000 - $99,999
## employment_statusEmployed full time:incomeLess than $10,000
## employment_statusEmployed full time,Employed part time:incomeLess than $10,000
## employment_statusEmployed full time,Student:incomeLess than $10,000
## employment_statusEmployed part time:incomeLess than $10,000
## employment_statusEmployed part time,Student:incomeLess than $10,000
## employment_statusRetired:incomeLess than $10,000
## employment_statusStudent:incomeLess than $10,000
## employment_statusUnemployed looking for work:incomeLess than $10,000
## employment_statusUnemployed looking for work,Student:incomeLess than $10,000
## employment_statusUnemployed not looking for work:incomeLess than $10,000
## employment_statusEmployed full time:incomeMore than $150,000
## employment_statusEmployed full time,Employed part time:incomeMore than $150,000
## employment_statusEmployed full time,Student:incomeMore than $150,000
## employment_statusEmployed part time:incomeMore than $150,000
## employment_statusEmployed part time,Student:incomeMore than $150,000
## employment_statusRetired:incomeMore than $150,000
## employment_statusStudent:incomeMore than $150,000
## employment_statusUnemployed looking for work:incomeMore than $150,000
## employment_statusUnemployed looking for work,Student:incomeMore than $150,000
## employment_statusUnemployed not looking for work:incomeMore than $150,000
## employment_statusEmployed full time:incomeRather not say
## employment_statusEmployed full time,Employed part time:incomeRather not say
## employment_statusEmployed full time,Student:incomeRather not say
## employment_statusEmployed part time:incomeRather not say
```

```
## employment_statusEmployed part time,Student:incomeRather not say
## employment_statusRetired:incomeRather not say
## employment_statusStudent:incomeRather not say
## employment_statusUnemployed looking for work:incomeRather not say
## employment_statusUnemployed looking for work,Student:incomeRather not say
## employment_statusUnemployed not looking for work:incomeRather not say
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 23.13 on 205 degrees of freedom
## Multiple R-squared:  0.2696, Adjusted R-squared:  0.0701
## F-statistic: 1.351 on 56 and 205 DF,  p-value: 0.06825
```

There are no significant outlook subjects in control have over the general employment for the next two decades.

```
# treatment
treatment %>%
  lm(treatment_employment ~ political_party + employment_status + income_class +
                            employment_status * income_class,
    data = .) %>%
  # coeftest(., vcovHC(.))
  summary(.)
```

```
##
## Call:
## lm(formula = treatment_employment ~ political_party + employment_status +
##     income_class + employment_status * income_class, data = .)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -57.643 -12.722   3.178  14.613  46.584
##
## Coefficients: (11 not defined because of singularities)
##                                                                  Estimate
## (Intercept)                                                         3.000
## political_partyMiddle/Independent                                  -4.226
## political_partyRight/Republican                                    19.359
## employment_statusDisabled                                          63.226
## employment_statusEmployed full time                                53.822
## employment_statusEmployed full time,Employed part time             84.209
## employment_statusEmployed part time                                54.643
## employment_statusEmployed part time,Student                        52.226
## employment_statusRetired                                           54.347
## employment_statusStudent                                           63.709
## employment_statusUnemployed looking for work                       34.483
## employment_statusUnemployed not looking for work                   56.591
## income_classmiddle                                                 -5.209
## income_classrich                                                   -6.951
## employment_statusDisabled:income_classmiddle                      -15.584
## employment_statusEmployed full time:income_classmiddle              3.127
## employment_statusEmployed full time,Employed part time:income_classmiddle      NA
## employment_statusEmployed part time:income_classmiddle              1.826
## employment_statusEmployed part time,Student:income_classmiddle    -14.018
## employment_statusRetired:income_classmiddle                        13.090
```

```
## employment_statusStudent:income_classmiddle                                      NA
## employment_statusUnemployed looking for work:income_classmiddle               21.575
## employment_statusUnemployed not looking for work:income_classmiddle               NA
## employment_statusDisabled:income_classrich                                        NA
## employment_statusEmployed full time:income_classrich                            2.084
## employment_statusEmployed full time,Employed part time:income_classrich            NA
## employment_statusEmployed part time:income_classrich                              NA
## employment_statusEmployed part time,Student:income_classrich                       NA
## employment_statusRetired:income_classrich                                         NA
## employment_statusStudent:income_classrich                                         NA
## employment_statusUnemployed looking for work:income_classrich                      NA
## employment_statusUnemployed not looking for work:income_classrich                  NA
##                                                                           Std. Error
## (Intercept)                                                                   21.909
## political_partyMiddle/Independent                                              3.171
## political_partyRight/Republican                                                3.266
## employment_statusDisabled                                                     27.020
## employment_statusEmployed full time                                           22.162
## employment_statusEmployed full time,Employed part time                        32.395
## employment_statusEmployed part time                                           22.678
## employment_statusEmployed part time,Student                                   27.020
## employment_statusRetired                                                      23.563
## employment_statusStudent                                                      28.450
## employment_statusUnemployed looking for work                                  23.059
## employment_statusUnemployed not looking for work                              23.129
## income_classmiddle                                                             9.456
## income_classrich                                                              23.239
## employment_statusDisabled:income_classmiddle                                  23.835
## employment_statusEmployed full time:income_classmiddle                        10.049
## employment_statusEmployed full time,Employed part time:income_classmiddle         NA
## employment_statusEmployed part time:income_classmiddle                        11.695
## employment_statusEmployed part time,Student:income_classmiddle                 28.611
## employment_statusRetired:income_classmiddle                                   14.904
## employment_statusStudent:income_classmiddle                                       NA
## employment_statusUnemployed looking for work:income_classmiddle               14.787
## employment_statusUnemployed not looking for work:income_classmiddle               NA
## employment_statusDisabled:income_classrich                                        NA
## employment_statusEmployed full time:income_classrich                          25.037
## employment_statusEmployed full time,Employed part time:income_classrich           NA
## employment_statusEmployed part time:income_classrich                              NA
## employment_statusEmployed part time,Student:income_classrich                      NA
## employment_statusRetired:income_classrich                                         NA
## employment_statusStudent:income_classrich                                         NA
## employment_statusUnemployed looking for work:income_classrich                     NA
## employment_statusUnemployed not looking for work:income_classrich                 NA
##                                                                              t value
## (Intercept)                                                                    0.137
## political_partyMiddle/Independent                                             -1.333
## political_partyRight/Republican                                                5.928
## employment_statusDisabled                                                      2.340
## employment_statusEmployed full time                                            2.429
## employment_statusEmployed full time,Employed part time                         2.599
## employment_statusEmployed part time                                            2.409
## employment_statusEmployed part time,Student                                    1.933
```

```
## employment_statusRetired                                                    2.307
## employment_statusStudent                                                    2.239
## employment_statusUnemployed looking for work                                1.495
## employment_statusUnemployed not looking for work                            2.447
## income_classmiddle                                                         -0.551
## income_classrich                                                           -0.299
## employment_statusDisabled:income_classmiddle                               -0.654
## employment_statusEmployed full time:income_classmiddle                      0.311
## employment_statusEmployed full time,Employed part time:income_classmiddle     NA
## employment_statusEmployed part time:income_classmiddle                      0.156
## employment_statusEmployed part time,Student:income_classmiddle             -0.490
## employment_statusRetired:income_classmiddle                                 0.878
## employment_statusStudent:income_classmiddle                                   NA
## employment_statusUnemployed looking for work:income_classmiddle             1.459
## employment_statusUnemployed not looking for work:income_classmiddle           NA
## employment_statusDisabled:income_classrich                                    NA
## employment_statusEmployed full time:income_classrich                        0.083
## employment_statusEmployed full time,Employed part time:income_classrich       NA
## employment_statusEmployed part time:income_classrich                          NA
## employment_statusEmployed part time,Student:income_classrich                  NA
## employment_statusRetired:income_classrich                                     NA
## employment_statusStudent:income_classrich                                     NA
## employment_statusUnemployed looking for work:income_classrich                 NA
## employment_statusUnemployed not looking for work:income_classrich             NA
##                                                                          Pr(>|t|)
## (Intercept)                                                               0.89119
## political_partyMiddle/Independent                                         0.18374
## political_partyRight/Republican                                          9.19e-09
## employment_statusDisabled                                                 0.02000
## employment_statusEmployed full time                                       0.01580
## employment_statusEmployed full time,Employed part time                    0.00984
## employment_statusEmployed part time                                       0.01664
## employment_statusEmployed part time,Student                               0.05428
## employment_statusRetired                                                  0.02183
## employment_statusStudent                                                  0.02594
## employment_statusUnemployed looking for work                              0.13596
## employment_statusUnemployed not looking for work                          0.01504
## income_classmiddle                                                        0.58219
## income_classrich                                                          0.76510
## employment_statusDisabled:income_classmiddle                              0.51377
## employment_statusEmployed full time:income_classmiddle                    0.75590
## employment_statusEmployed full time,Employed part time:income_classmiddle      NA
## employment_statusEmployed part time:income_classmiddle                    0.87602
## employment_statusEmployed part time,Student:income_classmiddle             0.62457
## employment_statusRetired:income_classmiddle                               0.38056
## employment_statusStudent:income_classmiddle                                    NA
## employment_statusUnemployed looking for work:income_classmiddle           0.14570
## employment_statusUnemployed not looking for work:income_classmiddle            NA
## employment_statusDisabled:income_classrich                                     NA
## employment_statusEmployed full time:income_classrich                      0.93371
## employment_statusEmployed full time,Employed part time:income_classrich        NA
## employment_statusEmployed part time:income_classrich                           NA
## employment_statusEmployed part time,Student:income_classrich                   NA
## employment_statusRetired:income_classrich                                      NA
```

```
## employment_statusStudent:income_classrich                                        NA
## employment_statusUnemployed looking for work:income_classrich                     NA
## employment_statusUnemployed not looking for work:income_classrich                 NA
##
## (Intercept)
## political_partyMiddle/Independent
## political_partyRight/Republican                                                  ***
## employment_statusDisabled                                                        *
## employment_statusEmployed full time                                              *
## employment_statusEmployed full time,Employed part time                           **
## employment_statusEmployed part time                                              *
## employment_statusEmployed part time,Student                                      .
## employment_statusRetired                                                         *
## employment_statusStudent                                                         *
## employment_statusUnemployed looking for work
## employment_statusUnemployed not looking for work                                 *
## income_classmiddle
## income_classrich
## employment_statusDisabled:income_classmiddle
## employment_statusEmployed full time:income_classmiddle
## employment_statusEmployed full time,Employed part time:income_classmiddle
## employment_statusEmployed part time:income_classmiddle
## employment_statusEmployed part time,Student:income_classmiddle
## employment_statusRetired:income_classmiddle
## employment_statusStudent:income_classmiddle
## employment_statusUnemployed looking for work:income_classmiddle
## employment_statusUnemployed not looking for work:income_classmiddle
## employment_statusDisabled:income_classrich
## employment_statusEmployed full time:income_classrich
## employment_statusEmployed full time,Employed part time:income_classrich
## employment_statusEmployed part time:income_classrich
## employment_statusEmployed part time,Student:income_classrich
## employment_statusRetired:income_classrich
## employment_statusStudent:income_classrich
## employment_statusUnemployed looking for work:income_classrich
## employment_statusUnemployed not looking for work:income_classrich
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 21.91 on 274 degrees of freedom
## Multiple R-squared:  0.2208, Adjusted R-squared:  0.1639
## F-statistic: 3.882 on 20 and 274 DF,  p-value: 1.49e-07
```

Republicans view the general employment outlook over the next two decades positively by an additional 6 points in the optimistic scale from 1 - 100, where 1 is not optimistic and 100 is very optimistic.

Retirement

block: political_party covariate: age + income_class interaction term: age * income_class

```
# control
control %>%
  lm(control_retirement ~ political_party + age + income +
                      age * income,
     data = .) %>%
```

```
# coeftest(., vcovHC(.))
summary(.)
```

```
##
## Call:
## lm(formula = control_retirement ~ political_party + age + income +
##     age * income, data = .)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -48.525 -15.568  -0.609  14.310  68.292
##
## Coefficients: (19 not defined because of singularities)
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                           61.78628   26.78470    2.307   0.0221
## political_partyLeft/Democrat         -14.99094   23.79143   -0.630   0.5293
## political_partyMiddle/Independent    -11.08163   23.54949   -0.471   0.6385
## political_partyRight/Republican       -3.79593   23.75649   -0.160   0.8732
## age25 - 34                           -14.66739   15.97097   -0.918   0.3595
## age35 - 44                           -35.34410   18.05389   -1.958   0.0517
## age45 - 54                           -45.40571   35.34840   -1.285   0.2004
## age55 - 64                           -31.14606   16.43921   -1.895   0.0596
## age65 - 74                           -20.34750   22.11619   -0.920   0.3587
## income$100,000 - $149,999            -19.84429   27.67463   -0.717   0.4742
## income$20,000 - $29,999               27.29534   28.46283    0.959   0.3387
## income$30,000 - $39,999              -10.79875   17.99421   -0.600   0.5491
## income$40,000 - $49,999              -10.77267   17.98442   -0.599   0.5499
## income$50,000 - $59,999               -6.29534   22.08431   -0.285   0.7759
## income$60,000 - $69,999               27.10899   15.47170    1.752   0.0813
## income$70,000 - $79,999                8.55216   25.65754    0.333   0.7392
## income$80,000 - $89,999               45.66024   39.49391    1.156   0.2490
## income$90,000 - $99,999               33.35715   31.19231    1.069   0.2862
## incomeLess than $10,000              -16.09845   19.40636   -0.830   0.4078
## incomeMore than $150,000              54.15571   27.67463    1.957   0.0518
## incomeRather not say                  -8.44784   31.31654   -0.270   0.7876
## age25 - 34:income$100,000 - $149,999  44.94025   31.86497    1.410   0.1600
## age35 - 44:income$100,000 - $149,999  49.44745   32.63482    1.515   0.1313
## age45 - 54:income$100,000 - $149,999  50.19479   41.76335    1.202   0.2308
## age55 - 64:income$100,000 - $149,999        NA         NA       NA       NA
## age65 - 74:income$100,000 - $149,999        NA         NA       NA       NA
## age25 - 34:income$20,000 - $29,999   -19.02668   30.96974   -0.614   0.5397
## age35 - 44:income$20,000 - $29,999    -7.03892   31.96618   -0.220   0.8259
## age45 - 54:income$20,000 - $29,999     7.22233   44.47829    0.162   0.8712
## age55 - 64:income$20,000 - $29,999    15.10072   35.17706    0.429   0.6682
## age65 - 74:income$20,000 - $29,999   -22.74319   42.46088   -0.536   0.5928
## age25 - 34:income$30,000 - $39,999    13.79445   21.42326    0.644   0.5204
## age35 - 44:income$30,000 - $39,999    38.94478   24.80578    1.570   0.1180
## age45 - 54:income$30,000 - $39,999    29.81161   41.73057    0.714   0.4758
## age55 - 64:income$30,000 - $39,999    27.14947   32.86448    0.826   0.4097
## age65 - 74:income$30,000 - $39,999    23.15590   35.96097    0.644   0.5204
## age25 - 34:income$40,000 - $49,999    20.10416   21.61083    0.930   0.3533
## age35 - 44:income$40,000 - $49,999    28.13956   23.47447    1.199   0.2321
## age45 - 54:income$40,000 - $49,999    20.78554   39.89591    0.521   0.6029
## age55 - 64:income$40,000 - $49,999    23.99339   25.51656    0.940   0.3482
```

```
## age65 - 74:income$40,000 - $49,999      69.32483    36.02958    1.924    0.0558
## age25 - 34:income$50,000 - $59,999      17.85835    25.14337    0.710    0.4784
## age35 - 44:income$50,000 - $59,999      40.45951    28.15686    1.437    0.1523
## age45 - 54:income$50,000 - $59,999      50.88212    41.61924    1.223    0.2229
## age55 - 64:income$50,000 - $59,999            NA          NA       NA       NA
## age65 - 74:income$50,000 - $59,999            NA          NA       NA       NA
## age25 - 34:income$60,000 - $69,999     -18.30422    20.88814   -0.876    0.3819
## age35 - 44:income$60,000 - $69,999      -6.78110    22.99009   -0.295    0.7683
## age45 - 54:income$60,000 - $69,999       3.43410    35.01275    0.098    0.9220
## age55 - 64:income$60,000 - $69,999            NA          NA       NA       NA
## age65 - 74:income$60,000 - $69,999            NA          NA       NA       NA
## age25 - 34:income$70,000 - $79,999       3.73750    29.53061    0.127    0.8994
## age35 - 44:income$70,000 - $79,999      19.16341    30.44481    0.629    0.5298
## age45 - 54:income$70,000 - $79,999      57.14890    45.93167    1.244    0.2149
## age55 - 64:income$70,000 - $79,999       7.88925    37.88916    0.208    0.8353
## age65 - 74:income$70,000 - $79,999            NA          NA       NA       NA
## age25 - 34:income$80,000 - $89,999      -6.83096    41.68806   -0.164    0.8700
## age35 - 44:income$80,000 - $89,999      -6.78270    43.88759   -0.155    0.8773
## age45 - 54:income$80,000 - $89,999            NA          NA       NA       NA
## age55 - 64:income$80,000 - $89,999            NA          NA       NA       NA
## age65 - 74:income$80,000 - $89,999            NA          NA       NA       NA
## age25 - 34:income$90,000 - $99,999     -16.68011    41.36514   -0.403    0.6872
## age35 - 44:income$90,000 - $99,999      -3.53573    36.09040   -0.098    0.9221
## age45 - 54:income$90,000 - $99,999      25.25322    51.85400    0.487    0.6268
## age55 - 64:income$90,000 - $99,999            NA          NA       NA       NA
## age65 - 74:income$90,000 - $99,999            NA          NA       NA       NA
## age25 - 34:incomeLess than $10,000       0.03095    23.38036    0.001    0.9989
## age35 - 44:incomeLess than $10,000      13.18734    25.88198    0.510    0.6110
## age45 - 54:incomeLess than $10,000      60.43274    40.43175    1.495    0.1366
## age55 - 64:incomeLess than $10,000      37.46201    24.39649    1.536    0.1262
## age65 - 74:incomeLess than $10,000            NA          NA       NA       NA
## age25 - 34:incomeMore than $150,000    -15.28367    38.85712   -0.393    0.6945
## age35 - 44:incomeMore than $150,000     -8.63871    34.65137   -0.249    0.8034
## age45 - 54:incomeMore than $150,000           NA          NA       NA       NA
## age55 - 64:incomeMore than $150,000           NA          NA       NA       NA
## age65 - 74:incomeMore than $150,000           NA          NA       NA       NA
## age25 - 34:incomeRather not say          7.04381    35.21998    0.200    0.8417
## age35 - 44:incomeRather not say         61.04194    38.37319    1.591    0.1132
## age45 - 54:incomeRather not say               NA          NA       NA       NA
## age55 - 64:incomeRather not say               NA          NA       NA       NA
## age65 - 74:incomeRather not say               NA          NA       NA       NA
##
## (Intercept)                            *
## political_partyLeft/Democrat
## political_partyMiddle/Independent
## political_partyRight/Republican
## age25 - 34
## age35 - 44                             .
## age45 - 54
## age55 - 64                             .
## age65 - 74
## income$100,000 - $149,999
## income$20,000 - $29,999
## income$30,000 - $39,999
```

72

```
## income$40,000 - $49,999
## income$50,000 - $59,999
## income$60,000 - $69,999                    .
## income$70,000 - $79,999
## income$80,000 - $89,999
## income$90,000 - $99,999
## incomeLess than $10,000
## incomeMore than $150,000                   .
## incomeRather not say
## age25 - 34:income$100,000 - $149,999
## age35 - 44:income$100,000 - $149,999
## age45 - 54:income$100,000 - $149,999
## age55 - 64:income$100,000 - $149,999
## age65 - 74:income$100,000 - $149,999
## age25 - 34:income$20,000 - $29,999
## age35 - 44:income$20,000 - $29,999
## age45 - 54:income$20,000 - $29,999
## age55 - 64:income$20,000 - $29,999
## age65 - 74:income$20,000 - $29,999
## age25 - 34:income$30,000 - $39,999
## age35 - 44:income$30,000 - $39,999
## age45 - 54:income$30,000 - $39,999
## age55 - 64:income$30,000 - $39,999
## age65 - 74:income$30,000 - $39,999
## age25 - 34:income$40,000 - $49,999
## age35 - 44:income$40,000 - $49,999
## age45 - 54:income$40,000 - $49,999
## age55 - 64:income$40,000 - $49,999
## age65 - 74:income$40,000 - $49,999    .
## age25 - 34:income$50,000 - $59,999
## age35 - 44:income$50,000 - $59,999
## age45 - 54:income$50,000 - $59,999
## age55 - 64:income$50,000 - $59,999
## age65 - 74:income$50,000 - $59,999
## age25 - 34:income$60,000 - $69,999
## age35 - 44:income$60,000 - $69,999
## age45 - 54:income$60,000 - $69,999
## age55 - 64:income$60,000 - $69,999
## age65 - 74:income$60,000 - $69,999
## age25 - 34:income$70,000 - $79,999
## age35 - 44:income$70,000 - $79,999
## age45 - 54:income$70,000 - $79,999
## age55 - 64:income$70,000 - $79,999
## age65 - 74:income$70,000 - $79,999
## age25 - 34:income$80,000 - $89,999
## age35 - 44:income$80,000 - $89,999
## age45 - 54:income$80,000 - $89,999
## age55 - 64:income$80,000 - $89,999
## age65 - 74:income$80,000 - $89,999
## age25 - 34:income$90,000 - $99,999
## age35 - 44:income$90,000 - $99,999
## age45 - 54:income$90,000 - $99,999
## age55 - 64:income$90,000 - $99,999
## age65 - 74:income$90,000 - $99,999
```

```
## age25 - 34:incomeLess than $10,000
## age35 - 44:incomeLess than $10,000
## age45 - 54:incomeLess than $10,000
## age55 - 64:incomeLess than $10,000
## age65 - 74:incomeLess than $10,000
## age25 - 34:incomeMore than $150,000
## age35 - 44:incomeMore than $150,000
## age45 - 54:incomeMore than $150,000
## age55 - 64:incomeMore than $150,000
## age65 - 74:incomeMore than $150,000
## age25 - 34:incomeRather not say
## age35 - 44:incomeRather not say
## age45 - 54:incomeRather not say
## age55 - 64:incomeRather not say
## age65 - 74:incomeRather not say
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 25.39 on 200 degrees of freedom
## Multiple R-squared:  0.2943, Adjusted R-squared:  0.07907
## F-statistic: 1.367 on 61 and 200 DF,  p-value: 0.05629
```

There are no significant outlook subjects in control have over their prospect for saving enough for retirement.

```
# treatment
treatment %>%
  lm(treatment_employment ~ political_party + age + income +
                            age * income,
     data = .) %>%
  # coeftest(., vcovHC(.))
  summary(.)
```

```
##
## Call:
## lm(formula = treatment_employment ~ political_party + age + income +
##     age * income, data = .)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -63.057 -12.015   1.819  13.585  42.503
##
## Coefficients: (19 not defined because of singularities)
##                                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        48.0000    15.5236   3.092  0.00223
## political_partyMiddle/Independent  -4.5592     3.4311  -1.329  0.18522
## political_partyRight/Republican    16.9541     3.5383   4.792 2.94e-06
## age25 - 34                         11.7615    19.0330   0.618  0.53721
## age35 - 44                          1.5000    21.9537   0.068  0.94558
## age45 - 54                         12.3462    17.4553   0.707  0.48008
## age55 - 64                         27.0000    26.8876   1.004  0.31633
## age65 - 74                         10.1549    23.6845   0.429  0.66849
## income$100,000 - $149,999          16.4043    36.0310   0.455  0.64933
## income$20,000 - $29,999            13.2796    19.0897   0.696  0.48734
## income$30,000 - $39,999            19.3728    20.1710   0.960  0.33783
## income$40,000 - $49,999            -2.8136    20.0735  -0.140  0.88865
```

```
## income$50,000 - $59,999                        5.1247   32.3595    0.158   0.87430
## income$60,000 - $69,999                        4.0459   31.2482    0.129   0.89709
## income$70,000 - $79,999                       16.1476   32.3046    0.500   0.61765
## income$80,000 - $89,999                       -8.4770   26.9458   -0.315   0.75335
## income$90,000 - $99,999                        9.0419   14.9082    0.607   0.54477
## incomeLess than $10,000                        4.8910   17.7110    0.276   0.78267
## incomeMore than $150,000                      -4.2870   17.4616   -0.246   0.80628
## incomeRather not say                           2.0000   26.8876    0.074   0.94077
## age25 - 34:income$100,000 - $149,999          -8.5452   38.5735   -0.222   0.82487
## age35 - 44:income$100,000 - $149,999           1.9470   40.4836    0.048   0.96168
## age45 - 54:income$100,000 - $149,999          -9.7198   38.1316   -0.255   0.79902
## age55 - 64:income$100,000 - $149,999         -26.3584   47.7765   -0.552   0.58168
## age65 - 74:income$100,000 - $149,999              NA        NA       NA        NA
## age25 - 34:income$20,000 - $29,999           -25.7270   22.8731   -1.125   0.26184
## age35 - 44:income$20,000 - $29,999            -3.0987   26.9285   -0.115   0.90849
## age45 - 54:income$20,000 - $29,999           -23.1710   22.3117   -1.039   0.30010
## age55 - 64:income$20,000 - $29,999           -46.4068   30.3989   -1.527   0.12821
## age65 - 74:income$20,000 - $29,999             1.5999   28.1504    0.057   0.95473
## age25 - 34:income$30,000 - $39,999           -11.5181   23.3495   -0.493   0.62227
## age35 - 44:income$30,000 - $39,999           -14.2648   26.7152   -0.534   0.59388
## age45 - 54:income$30,000 - $39,999           -19.2604   23.1772   -0.831   0.40682
## age55 - 64:income$30,000 - $39,999           -44.0976   31.0877   -1.418   0.15738
## age65 - 74:income$30,000 - $39,999            -0.3765   28.9486   -0.013   0.98964
## age25 - 34:income$40,000 - $49,999            -9.4505   23.6516   -0.400   0.68984
## age35 - 44:income$40,000 - $49,999             5.7517   25.9070    0.222   0.82450
## age45 - 54:income$40,000 - $49,999             1.8467   25.0938    0.074   0.94140
## age55 - 64:income$40,000 - $49,999           -38.6272   37.0243   -1.043   0.29789
## age65 - 74:income$40,000 - $49,999            -6.0388   30.9512   -0.195   0.84548
## age25 - 34:income$50,000 - $59,999           -14.4016   34.5647   -0.417   0.67731
## age35 - 44:income$50,000 - $59,999             5.6281   36.3970    0.155   0.87725
## age45 - 54:income$50,000 - $59,999             1.0521   36.8578    0.029   0.97725
## age55 - 64:income$50,000 - $59,999           -33.0941   41.2824   -0.802   0.42357
## age65 - 74:income$50,000 - $59,999                NA        NA       NA        NA
## age25 - 34:income$60,000 - $69,999            -2.3937   33.9320   -0.071   0.94382
## age35 - 44:income$60,000 - $69,999            -0.1108   35.8184   -0.003   0.99753
## age45 - 54:income$60,000 - $69,999            -7.1191   34.0063   -0.209   0.83436
## age55 - 64:income$60,000 - $69,999                NA        NA       NA        NA
## age65 - 74:income$60,000 - $69,999                NA        NA       NA        NA
## age25 - 34:income$70,000 - $79,999           -19.9245   34.8380   -0.572   0.56793
## age35 - 44:income$70,000 - $79,999           -15.0280   36.4121   -0.413   0.68019
## age45 - 54:income$70,000 - $79,999           -23.6254   35.5732   -0.664   0.50726
## age55 - 64:income$70,000 - $79,999                NA        NA       NA        NA
## age65 - 74:income$70,000 - $79,999                NA        NA       NA        NA
## age25 - 34:income$80,000 - $89,999            -0.1217   31.0607   -0.004   0.99688
## age35 - 44:income$80,000 - $89,999            16.7566   34.7600    0.482   0.63021
## age45 - 54:income$80,000 - $89,999                NA        NA       NA        NA
## age55 - 64:income$80,000 - $89,999                NA        NA       NA        NA
## age65 - 74:income$80,000 - $89,999                NA        NA       NA        NA
## age25 - 34:income$90,000 - $99,999           -13.9350   22.4068   -0.622   0.53461
## age35 - 44:income$90,000 - $99,999           -28.5419   30.7441   -0.928   0.35417
## age45 - 54:income$90,000 - $99,999                NA        NA       NA        NA
## age55 - 64:income$90,000 - $99,999                NA        NA       NA        NA
## age65 - 74:income$90,000 - $99,999                NA        NA       NA        NA
## age25 - 34:incomeLess than $10,000           -21.4255   22.1575   -0.967   0.33456
```

```
## age35 - 44:incomeLess than $10,000     -4.3515   26.6754  -0.163  0.87056
## age45 - 54:incomeLess than $10,000    -57.9575   24.8074  -2.336  0.02032
## age55 - 64:incomeLess than $10,000    -28.1695   30.8917  -0.912  0.36277
## age65 - 74:incomeLess than $10,000         NA        NA      NA       NA
## age25 - 34:incomeMore than $150,000    -6.9515   25.8268  -0.269  0.78804
## age35 - 44:incomeMore than $150,000     9.1509   26.6785   0.343  0.73190
## age45 - 54:incomeMore than $150,000         NA        NA      NA       NA
## age55 - 64:incomeMore than $150,000         NA        NA      NA       NA
## age65 - 74:incomeMore than $150,000         NA        NA      NA       NA
## age25 - 34:incomeRather not say        -36.2023   33.0794  -1.094  0.27490
## age35 - 44:incomeRather not say         18.5000   38.0249   0.487  0.62705
## age45 - 54:incomeRather not say             NA        NA      NA       NA
## age55 - 64:incomeRather not say             NA        NA      NA       NA
## age65 - 74:incomeRather not say             NA        NA      NA       NA
##
## (Intercept)                          **
## political_partyMiddle/Independent
## political_partyRight/Republican      ***
## age25 - 34
## age35 - 44
## age45 - 54
## age55 - 64
## age65 - 74
## income$100,000 - $149,999
## income$20,000 - $29,999
## income$30,000 - $39,999
## income$40,000 - $49,999
## income$50,000 - $59,999
## income$60,000 - $69,999
## income$70,000 - $79,999
## income$80,000 - $89,999
## income$90,000 - $99,999
## incomeLess than $10,000
## incomeMore than $150,000
## incomeRather not say
## age25 - 34:income$100,000 - $149,999
## age35 - 44:income$100,000 - $149,999
## age45 - 54:income$100,000 - $149,999
## age55 - 64:income$100,000 - $149,999
## age65 - 74:income$100,000 - $149,999
## age25 - 34:income$20,000 - $29,999
## age35 - 44:income$20,000 - $29,999
## age45 - 54:income$20,000 - $29,999
## age55 - 64:income$20,000 - $29,999
## age65 - 74:income$20,000 - $29,999
## age25 - 34:income$30,000 - $39,999
## age35 - 44:income$30,000 - $39,999
## age45 - 54:income$30,000 - $39,999
## age55 - 64:income$30,000 - $39,999
## age65 - 74:income$30,000 - $39,999
## age25 - 34:income$40,000 - $49,999
## age35 - 44:income$40,000 - $49,999
## age45 - 54:income$40,000 - $49,999
## age55 - 64:income$40,000 - $49,999
```

```
## age65 - 74:income$40,000 - $49,999
## age25 - 34:income$50,000 - $59,999
## age35 - 44:income$50,000 - $59,999
## age45 - 54:income$50,000 - $59,999
## age55 - 64:income$50,000 - $59,999
## age65 - 74:income$50,000 - $59,999
## age25 - 34:income$60,000 - $69,999
## age35 - 44:income$60,000 - $69,999
## age45 - 54:income$60,000 - $69,999
## age55 - 64:income$60,000 - $69,999
## age65 - 74:income$60,000 - $69,999
## age25 - 34:income$70,000 - $79,999
## age35 - 44:income$70,000 - $79,999
## age45 - 54:income$70,000 - $79,999
## age55 - 64:income$70,000 - $79,999
## age65 - 74:income$70,000 - $79,999
## age25 - 34:income$80,000 - $89,999
## age35 - 44:income$80,000 - $89,999
## age45 - 54:income$80,000 - $89,999
## age55 - 64:income$80,000 - $89,999
## age65 - 74:income$80,000 - $89,999
## age25 - 34:income$90,000 - $99,999
## age35 - 44:income$90,000 - $99,999
## age45 - 54:income$90,000 - $99,999
## age55 - 64:income$90,000 - $99,999
## age65 - 74:income$90,000 - $99,999
## age25 - 34:incomeLess than $10,000
## age35 - 44:incomeLess than $10,000
## age45 - 54:incomeLess than $10,000    *
## age55 - 64:incomeLess than $10,000
## age65 - 74:incomeLess than $10,000
## age25 - 34:incomeMore than $150,000
## age35 - 44:incomeMore than $150,000
## age45 - 54:incomeMore than $150,000
## age55 - 64:incomeMore than $150,000
## age65 - 74:incomeMore than $150,000
## age25 - 34:incomeRather not say
## age35 - 44:incomeRather not say
## age45 - 54:incomeRather not say
## age55 - 64:incomeRather not say
## age65 - 74:incomeRather not say
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 21.95 on 234 degrees of freedom
## Multiple R-squared:  0.3318, Adjusted R-squared:  0.1605
## F-statistic: 1.937 on 60 and 234 DF,  p-value: 0.0002664
```

Republicans view their prospects for saving enough for retirement positively by an additional 16 points in the optimistic scale from 1 - 100, where 1 is not optimistic and 100 is very optimistic. In addition, subjects who are close to the retirement age (age 55-64) and are making less than $10,000 view their prospects for saving enough for retirement negatively by -58 points in the optimistic scale.

Cybersecurity

block: political_party covariate: internet_from_mobile, internet_from_home, internet_from_work, who_pays_internet, income

interaction term: income_class * internet_from_work

```r
# control
control %>%
  lm(control_cybersecurity ~ political_party + internet_from_mobile + internet_from_home +
                             internet_from_work + who_pays_internet + income_class +
                             internet_from_work * income_class,
     data = .) %>%
  # coeftest(., vcovHC(.))
  summary(.)
```

```
##
## Call:
## lm(formula = control_cybersecurity ~ political_party + internet_from_mobile +
##     internet_from_home + internet_from_work + who_pays_internet +
##     income_class + internet_from_work * income_class, data = .)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -68.849  -7.832   2.419  12.032  39.157
##
## Coefficients: (5 not defined because of singularities)
##                                                               Estimate
## (Intercept)                                                   127.8677
## political_partyLeft/Democrat                                  -10.1174
## political_partyMiddle/Independent                             -12.3047
## political_partyRight/Republican                                -1.4604
## internet_from_mobileDaily                                      -9.5921
## internet_from_mobileI do not have a mobile phone               -3.9615
## internet_from_mobileLess than once a month                    -13.9863
## internet_from_mobileMonthly                                    -2.7540
## internet_from_mobileNever                                     -19.0145
## internet_from_mobileWeekly                                     -5.9713
## internet_from_homeDaily                                       -27.1582
## internet_from_homeI do not have internet at my house          -21.0074
## internet_from_homeMonthly                                      -4.1873
## internet_from_homeNever                                       -56.7067
## internet_from_homeWeekly                                      -38.4113
## internet_from_workI am currently not working                  -2.9986
## internet_from_workLess than once a month                       0.9880
## internet_from_workMonthly                                      -4.4394
## internet_from_workNever                                       -0.4345
## internet_from_workWeekly                                       3.0307
## who_pays_internetOther                                        -19.4673
## who_pays_internetParents                                      -11.2829
## who_pays_internetSchool                                       -26.3842
## who_pays_internetSelf/Spouse                                  -14.9709
## who_pays_internetWork                                          -9.7042
## income_classmiddle                                             2.8201
## income_classrich                                              12.2948
## internet_from_workI am currently not working:income_classmiddle   7.5627
## internet_from_workLess than once a month:income_classmiddle   16.5058
## internet_from_workMonthly:income_classmiddle                        NA
```

```
## internet_from_workNever:income_classmiddle                              6.5861
## internet_from_workWeekly:income_classmiddle                            -12.5960
## internet_from_workI am currently not working:income_classrich            8.6747
## internet_from_workLess than once a month:income_classrich                    NA
## internet_from_workMonthly:income_classrich                                   NA
## internet_from_workNever:income_classrich                                     NA
## internet_from_workWeekly:income_classrich                                    NA
##                                                                      Std. Error
## (Intercept)                                                             35.3463
## political_partyLeft/Democrat                                            18.5859
## political_partyMiddle/Independent                                       18.6627
## political_partyRight/Republican                                         18.7060
## internet_from_mobileDaily                                               17.8733
## internet_from_mobileI do not have a mobile phone                        21.2533
## internet_from_mobileLess than once a month                              19.7237
## internet_from_mobileMonthly                                             23.4683
## internet_from_mobileNever                                               20.1284
## internet_from_mobileWeekly                                              18.5187
## internet_from_homeDaily                                                 21.7072
## internet_from_homeI do not have internet at my house                    30.6202
## internet_from_homeMonthly                                               30.4292
## internet_from_homeNever                                                 44.5376
## internet_from_homeWeekly                                                24.2197
## internet_from_workI am currently not working                            5.8888
## internet_from_workLess than once a month                                15.9397
## internet_from_workMonthly                                               16.1873
## internet_from_workNever                                                  8.8128
## internet_from_workWeekly                                                 7.6656
## who_pays_internetOther                                                  24.4576
## who_pays_internetParents                                                22.4816
## who_pays_internetSchool                                                 30.8757
## who_pays_internetSelf/Spouse                                            21.7126
## who_pays_internetWork                                                   23.9077
## income_classmiddle                                                       3.7180
## income_classrich                                                         9.8308
## internet_from_workI am currently not working:income_classmiddle          8.0948
## internet_from_workLess than once a month:income_classmiddle             26.8343
## internet_from_workMonthly:income_classmiddle                                 NA
## internet_from_workNever:income_classmiddle                              11.9494
## internet_from_workWeekly:income_classmiddle                             12.6804
## internet_from_workI am currently not working:income_classrich           24.1364
## internet_from_workLess than once a month:income_classrich                    NA
## internet_from_workMonthly:income_classrich                                   NA
## internet_from_workNever:income_classrich                                     NA
## internet_from_workWeekly:income_classrich                                    NA
##                                                                         t value
## (Intercept)                                                               3.618
## political_partyLeft/Democrat                                             -0.544
## political_partyMiddle/Independent                                        -0.659
## political_partyRight/Republican                                          -0.078
## internet_from_mobileDaily                                                -0.537
## internet_from_mobileI do not have a mobile phone                         -0.186
## internet_from_mobileLess than once a month                               -0.709
## internet_from_mobileMonthly                                              -0.117
```

```
## internet_from_mobileNever                                      -0.945
## internet_from_mobileWeekly                                     -0.322
## internet_from_homeDaily                                        -1.251
## internet_from_homeI do not have internet at my house           -0.686
## internet_from_homeMonthly                                      -0.138
## internet_from_homeNever                                        -1.273
## internet_from_homeWeekly                                       -1.586
## internet_from_workI am currently not working                   -0.509
## internet_from_workLess than once a month                        0.062
## internet_from_workMonthly                                      -0.274
## internet_from_workNever                                        -0.049
## internet_from_workWeekly                                        0.395
## who_pays_internetOther                                         -0.796
## who_pays_internetParents                                       -0.502
## who_pays_internetSchool                                        -0.855
## who_pays_internetSelf/Spouse                                   -0.690
## who_pays_internetWork                                          -0.406
## income_classmiddle                                              0.759
## income_classrich                                                1.251
## internet_from_workI am currently not working:income_classmiddle 0.934
## internet_from_workLess than once a month:income_classmiddle    0.615
## internet_from_workMonthly:income_classmiddle                      NA
## internet_from_workNever:income_classmiddle                     0.551
## internet_from_workWeekly:income_classmiddle                    -0.993
## internet_from_workI am currently not working:income_classrich   0.359
## internet_from_workLess than once a month:income_classrich         NA
## internet_from_workMonthly:income_classrich                        NA
## internet_from_workNever:income_classrich                          NA
## internet_from_workWeekly:income_classrich                         NA
##                                                                Pr(>|t|)
## (Intercept)                                                    0.000366
## political_partyLeft/Democrat                                   0.586720
## political_partyMiddle/Independent                              0.510351
## political_partyRight/Republican                                0.937838
## internet_from_mobileDaily                                      0.592014
## internet_from_mobileI do not have a mobile phone               0.852299
## internet_from_mobileLess than once a month                     0.478974
## internet_from_mobileMonthly                                    0.906685
## internet_from_mobileNever                                      0.345824
## internet_from_mobileWeekly                                     0.747408
## internet_from_homeDaily                                        0.212164
## internet_from_homeI do not have internet at my house           0.493364
## internet_from_homeMonthly                                      0.890672
## internet_from_homeNever                                        0.204221
## internet_from_homeWeekly                                       0.114124
## internet_from_workI am currently not working                   0.611098
## internet_from_workLess than once a month                       0.950630
## internet_from_workMonthly                                      0.784138
## internet_from_workNever                                        0.960718
## internet_from_workWeekly                                       0.692942
## who_pays_internetOther                                         0.426873
## who_pays_internetParents                                       0.616237
## who_pays_internetSchool                                        0.393700
## who_pays_internetSelf/Spouse                                   0.491202
```

```
## who_pays_internetWork                                              0.685192
## income_classmiddle                                                 0.448926
## income_classrich                                                   0.212339
## internet_from_workI am currently not working:income_classmiddle 0.351150
## internet_from_workLess than once a month:income_classmiddle     0.539096
## internet_from_workMonthly:income_classmiddle                            NA
## internet_from_workNever:income_classmiddle                        0.582053
## internet_from_workWeekly:income_classmiddle                       0.321584
## internet_from_workI am currently not working:income_classrich   0.719623
## internet_from_workLess than once a month:income_classrich               NA
## internet_from_workMonthly:income_classrich                              NA
## internet_from_workNever:income_classrich                                NA
## internet_from_workWeekly:income_classrich                               NA
##
## (Intercept)                                                      ***
## political_partyLeft/Democrat
## political_partyMiddle/Independent
## political_partyRight/Republican
## internet_from_mobileDaily
## internet_from_mobileI do not have a mobile phone
## internet_from_mobileLess than once a month
## internet_from_mobileMonthly
## internet_from_mobileNever
## internet_from_mobileWeekly
## internet_from_homeDaily
## internet_from_homeI do not have internet at my house
## internet_from_homeMonthly
## internet_from_homeNever
## internet_from_homeWeekly
## internet_from_workI am currently not working
## internet_from_workLess than once a month
## internet_from_workMonthly
## internet_from_workNever
## internet_from_workWeekly
## who_pays_internetOther
## who_pays_internetParents
## who_pays_internetSchool
## who_pays_internetSelf/Spouse
## who_pays_internetWork
## income_classmiddle
## income_classrich
## internet_from_workI am currently not working:income_classmiddle
## internet_from_workLess than once a month:income_classmiddle
## internet_from_workMonthly:income_classmiddle
## internet_from_workNever:income_classmiddle
## internet_from_workWeekly:income_classmiddle
## internet_from_workI am currently not working:income_classrich
## internet_from_workLess than once a month:income_classrich
## internet_from_workMonthly:income_classrich
## internet_from_workNever:income_classrich
## internet_from_workWeekly:income_classrich
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 21.4 on 230 degrees of freedom
## Multiple R-squared:  0.09714,    Adjusted R-squared:  -0.02455
## F-statistic: 0.7983 on 31 and 230 DF,  p-value: 0.7697
```

Democrats view cyberattacks a low threat to their general livelihood, having -10 points lower in the threat level scale where 1 is very low threat and 100 is very high threat.

```
# treatment
treatment %>%
  lm(treatment_cybersecurity ~ political_party + internet_from_mobile + internet_from_home +
                               internet_from_work + who_pays_internet + income_class +
                               internet_from_work * income_class,
     data = .) %>%
  #coeftest(., vcovHC(.))
  summary(.)
```

```
##
## Call:
## lm(formula = treatment_cybersecurity ~ political_party + internet_from_mobile +
##     internet_from_home + internet_from_work + who_pays_internet +
##     income_class + internet_from_work * income_class, data = .)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -66.450 -11.558   2.901  14.546  37.151
##
## Coefficients: (6 not defined because of singularities)
##                                                             Estimate
## (Intercept)                                                  125.008
## political_partyMiddle/Independent                              3.991
## political_partyRight/Republican                                5.441
## internet_from_mobileI do not have a mobile phone               3.612
## internet_from_mobileLess than once a month                     6.186
## internet_from_mobileMonthly                                   11.327
## internet_from_mobileNever                                      5.526
## internet_from_mobileWeekly                                    -2.756
## internet_from_homeDaily                                      -29.908
## internet_from_homeI do not have internet at my house         -40.566
## internet_from_homeMonthly                                    -25.087
## internet_from_homeWeekly                                     -29.218
## internet_from_workDaily                                       -3.541
## internet_from_workI am currently not working                  5.993
## internet_from_workLess than once a month                     -7.555
## internet_from_workMonthly                                   -19.256
## internet_from_workNever                                       3.538
## internet_from_workWeekly                                      7.424
## who_pays_internetOther                                      -16.067
## who_pays_internetParents                                    -28.368
## who_pays_internetSchool                                     -19.444
## who_pays_internetSelf/Spouse                                -25.100
## who_pays_internetWork                                       -25.853
## income_classmiddle                                          -33.590
## income_classrich                                             -7.529
## internet_from_workDaily:income_classmiddle                   29.980
## internet_from_workI am currently not working:income_classmiddle  34.255
```

```
## internet_from_workLess than once a month:income_classmiddle           NA
## internet_from_workMonthly:income_classmiddle                       66.628
## internet_from_workNever:income_classmiddle                         13.312
## internet_from_workWeekly:income_classmiddle                            NA
## internet_from_workDaily:income_classrich                           22.496
## internet_from_workI am currently not working:income_classrich      -5.905
## internet_from_workLess than once a month:income_classrich              NA
## internet_from_workMonthly:income_classrich                             NA
## internet_from_workNever:income_classrich                               NA
## internet_from_workWeekly:income_classrich                              NA
##                                                               Std. Error
## (Intercept)                                                       36.871
## political_partyMiddle/Independent                                  3.051
## political_partyRight/Republican                                    3.161
## internet_from_mobileI do not have a mobile phone                  10.761
## internet_from_mobileLess than once a month                         7.862
## internet_from_mobileMonthly                                        9.951
## internet_from_mobileNever                                          6.770
## internet_from_mobileWeekly                                         5.928
## internet_from_homeDaily                                           21.859
## internet_from_homeI do not have internet at my house             30.583
## internet_from_homeMonthly                                        25.139
## internet_from_homeWeekly                                         24.873
## internet_from_workDaily                                          21.195
## internet_from_workI am currently not working                    21.512
## internet_from_workLess than once a month                        23.741
## internet_from_workMonthly                                        34.334
## internet_from_workNever                                         21.947
## internet_from_workWeekly                                        22.950
## who_pays_internetOther                                          23.428
## who_pays_internetParents                                        21.691
## who_pays_internetSchool                                         27.762
## who_pays_internetSelf/Spouse                                    21.202
## who_pays_internetWork                                           22.927
## income_classmiddle                                             13.423
## income_classrich                                               21.954
## internet_from_workDaily:income_classmiddle                     13.801
## internet_from_workI am currently not working:income_classmiddle  14.708
## internet_from_workLess than once a month:income_classmiddle        NA
## internet_from_workMonthly:income_classmiddle                   37.460
## internet_from_workNever:income_classmiddle                     16.517
## internet_from_workWeekly:income_classmiddle                        NA
## internet_from_workDaily:income_classrich                       24.067
## internet_from_workI am currently not working:income_classrich  30.758
## internet_from_workLess than once a month:income_classrich          NA
## internet_from_workMonthly:income_classrich                         NA
## internet_from_workNever:income_classrich                           NA
## internet_from_workWeekly:income_classrich                          NA
##                                                               t value
## (Intercept)                                                     3.390
## political_partyMiddle/Independent                               1.308
## political_partyRight/Republican                                 1.721
## internet_from_mobileI do not have a mobile phone                0.336
## internet_from_mobileLess than once a month                      0.787
```

```
## internet_from_mobileMonthly                                       1.138
## internet_from_mobileNever                                         0.816
## internet_from_mobileWeekly                                       -0.465
## internet_from_homeDaily                                          -1.368
## internet_from_homeI do not have internet at my house             -1.326
## internet_from_homeMonthly                                        -0.998
## internet_from_homeWeekly                                         -1.175
## internet_from_workDaily                                          -0.167
## internet_from_workI am currently not working                     0.279
## internet_from_workLess than once a month                        -0.318
## internet_from_workMonthly                                        -0.561
## internet_from_workNever                                          0.161
## internet_from_workWeekly                                         0.323
## who_pays_internetOther                                          -0.686
## who_pays_internetParents                                        -1.308
## who_pays_internetSchool                                         -0.700
## who_pays_internetSelf/Spouse                                    -1.184
## who_pays_internetWork                                           -1.128
## income_classmiddle                                              -2.502
## income_classrich                                                -0.343
## internet_from_workDaily:income_classmiddle                       2.172
## internet_from_workI am currently not working:income_classmiddle  2.329
## internet_from_workLess than once a month:income_classmiddle        NA
## internet_from_workMonthly:income_classmiddle                     1.779
## internet_from_workNever:income_classmiddle                       0.806
## internet_from_workWeekly:income_classmiddle                        NA
## internet_from_workDaily:income_classrich                         0.935
## internet_from_workI am currently not working:income_classrich   -0.192
## internet_from_workLess than once a month:income_classrich          NA
## internet_from_workMonthly:income_classrich                         NA
## internet_from_workNever:income_classrich                           NA
## internet_from_workWeekly:income_classrich                          NA
##                                                                 Pr(>|t|)
## (Intercept)                                                     0.000805
## political_partyMiddle/Independent                               0.191916
## political_partyRight/Republican                                 0.086377
## internet_from_mobileI do not have a mobile phone                0.737403
## internet_from_mobileLess than once a month                      0.432097
## internet_from_mobileMonthly                                     0.256019
## internet_from_mobileNever                                       0.415097
## internet_from_mobileWeekly                                      0.642326
## internet_from_homeDaily                                         0.172412
## internet_from_homeI do not have internet at my house            0.185854
## internet_from_homeMonthly                                       0.319233
## internet_from_homeWeekly                                        0.241186
## internet_from_workDaily                                         0.867430
## internet_from_workI am currently not working                    0.780782
## internet_from_workLess than once a month                        0.750566
## internet_from_workMonthly                                       0.575369
## internet_from_workNever                                         0.872070
## internet_from_workWeekly                                        0.746582
## who_pays_internetOther                                          0.493456
## who_pays_internetParents                                        0.192068
## who_pays_internetSchool                                         0.484309
```

```
## who_pays_internetSelf/Spouse                                    0.237532
## who_pays_internetWork                                           0.260504
## income_classmiddle                                              0.012941
## income_classrich                                                0.731916
## internet_from_workDaily:income_classmiddle                      0.030720
## internet_from_workI am currently not working:income_classmiddle 0.020616
## internet_from_workLess than once a month:income_classmiddle           NA
## internet_from_workMonthly:income_classmiddle                    0.076451
## internet_from_workNever:income_classmiddle                      0.421012
## internet_from_workWeekly:income_classmiddle                           NA
## internet_from_workDaily:income_classrich                        0.350796
## internet_from_workI am currently not working:income_classrich   0.847898
## internet_from_workLess than once a month:income_classrich             NA
## internet_from_workMonthly:income_classrich                            NA
## internet_from_workNever:income_classrich                              NA
## internet_from_workWeekly:income_classrich                             NA
##
## (Intercept)                                                     ***
## political_partyMiddle/Independent
## political_partyRight/Republican                                 .
## internet_from_mobileI do not have a mobile phone
## internet_from_mobileLess than once a month
## internet_from_mobileMonthly
## internet_from_mobileNever
## internet_from_mobileWeekly
## internet_from_homeDaily
## internet_from_homeI do not have internet at my house
## internet_from_homeMonthly
## internet_from_homeWeekly
## internet_from_workDaily
## internet_from_workI am currently not working
## internet_from_workLess than once a month
## internet_from_workMonthly
## internet_from_workNever
## internet_from_workWeekly
## who_pays_internetOther
## who_pays_internetParents
## who_pays_internetSchool
## who_pays_internetSelf/Spouse
## who_pays_internetWork
## income_classmiddle                                              *
## income_classrich
## internet_from_workDaily:income_classmiddle                      *
## internet_from_workI am currently not working:income_classmiddle *
## internet_from_workLess than once a month:income_classmiddle
## internet_from_workMonthly:income_classmiddle                    .
## internet_from_workNever:income_classmiddle
## internet_from_workWeekly:income_classmiddle
## internet_from_workDaily:income_classrich
## internet_from_workI am currently not working:income_classrich
## internet_from_workLess than once a month:income_classrich
## internet_from_workMonthly:income_classrich
## internet_from_workNever:income_classrich
## internet_from_workWeekly:income_classrich
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 20.92 on 264 degrees of freedom
## Multiple R-squared:  0.1407, Adjusted R-squared:  0.04311
## F-statistic: 1.441 on 30 and 264 DF,  p-value: 0.06985
```

The middle class in general are more concerned about their cybersecurity threat when presented with the treatment of our president's name in the brief excerpt.

TODO: figure out why political party is not showing up in the output...potentially correlated?

References

1. renaming column names: http://rprogramming.net/rename-columns-in-r/
2. interaction terms: http://statisticsbyjim.com/regression/interaction-effects/

Unused stuff

IP

Get state, country information from IPs. IPs are not reliable though. Plus, it's dang slow.

```
freegeoip <- function(ip, format = ifelse(length(ip)==1,'list','dataframe'))
{
    if (1 == length(ip))
    {
        # a single IP address
        url <- paste(c("http://api.ipstack.com/", ip, "?access_key=0e93a4defcd645bd8829ad75a7223437&out
        ret <- fromJSON(readLines(url, warn=FALSE))
        if (format == 'dataframe')
            ret <- data.frame(t(unlist(ret)))
        return(ret)
    } else {
        ret <- data.frame()
        for (i in 1:length(ip))
        {
            r <- freegeoip(ip[i], format="dataframe")
            ret <- bind_rows(ret, r)
        }
        return(ret)
    }
}

try.ip <- function(ip) {
  suppressWarnings(try(freegeoip(ip), silent = TRUE))
}

ips <- try.ip(data$IPAddress)
```

LatLong

Get state, country information from Google API. Unfortunately, it's taking too long and Google has a limit for the number of API calls.

How to call the API via the browser: https://maps.googleapis.com/maps/api/geocode/json?latlng=40.714224, -73.961452&key=AIzaSyC8Q7FY6SzmEfpMTOcx2BTrnYaRkzX12Ik

How to call the API via R:

```
library(revgeo)
revgeo(longitude=-73.961452, latitude=40.714224, output="frame", provider="google", API="AIzaSyC8Q7FY6S
```

This will always fail because of the limitation to the number of API calls:

```
ll <- revgeo(longitude = data$LocationLongitude, latitude = data$LocationLatitude, output = "frame", pr
```

Getting USA (or any other country)'s latlong

```
library(ggmap)
geocode("USA")
```