

Group Project

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Input data

```
## setting working directory
setwd("C:/git/statsGroupProject/R")
## input data
load("ces.RData")

library(ggplot2)
```

Variables to factor

```
data <- load("ces.RData")

ces$polengage <- ces$voted + ces$meeting + ces$sign +
  ces$campaign + ces$protest + ces$contact + ces$donate

## Region
ces$region <- factor(ces$region,
  levels = 1:4,
  labels = c("Northeast", "Midwest", "South", "West")
)

## Gender
ces$gender <- factor(ces$gender,
  levels = 1:2,
  labels = c("Male", "Female")
)

## Education
ces$educ <- factor(ces$educ,
  levels = 1:6,
  labels = c(
    "No HS", "High School Graduate", "Some college",
    "2-year degree", "4-year degree", "Post-grad"
  )
)
```

```

## Race
ces$race <- factor(ces$race,
  levels = 1:8,
  labels = c(
    "White", "Black", "Hispanic", "Asian",
    "Native American", "Middle Eastern", "Two or more races", "Other"
  )
)

## Hispanic
ces$hispanic <- factor(ces$hispanic,
  levels = 1:2,
  labels = c("Yes", "No")
)

## Homeowner
ces$ownhome <- factor(ces$ownhome,
  levels = 1:3,
  labels = c("Own", "Rent", "Other")
)

## Neighborhood Type
ces$urbancity <- factor(ces$urbancity,
  levels = 1:5,
  labels = c("City", "Suburb", "Town", "Rural Area", "Other")
)

## Union
ces$unionhh <- factor(ces$unionhh,
  levels = 1:2,
  labels = c("Yes", "No")
)

## Religious
ces$religious <- factor(ces$religious,
  levels = 1:4,
  labels = c(
    "Very important", "Not too important",
    "Not too important", "Not at all important"
  )
)

## Family income
ces$faminc2 <- factor(ces$faminc,
  levels = 1:16,
  labels = c(
    "< 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 - 99,999", "100,000-119,000", "120,000 - 149,999",
    "150,000 - 199,999", "200,000 - 249,999", "250,000 - 349,999",
    "350,000 - 499,999", "500,000 or more"
  )
)

```

```

)

## Voted
ces$voted <- factor(ces$voted,
  levels = 1:2,
  labels = c("Yes", "No")
)

## Meeting
ces$meeting <- factor(ces$meeting,
  levels = 1:2,
  labels = c("Yes", "No")
)

## Signed
ces$sign <- factor(ces$sign,
  levels = 1:2,
  labels = c("Yes", "No")
)

## Campaign
ces$campaign <- factor(ces$campaign,
  levels = 1:2,
  labels = c("Yes", "No")
)

## Protest
ces$protest <- factor(ces$protest,
  levels = 1:2,
  labels = c("Yes", "No")
)

## Contact
ces$contact <- factor(ces$contact,
  levels = 1:2,
  labels = c("Yes", "No")
)

## Donate
ces$donate <- factor(ces$donate,
  levels = 1:2,
  labels = c("Yes", "No")
)

## ideo5
ces$ideo5 <- factor(ces$ideo5,
  levels = 1:5,
  labels = c(
    "Very liberal", "Liberal", "Moderate",
    "Conservative", "Very Conservative"
  )
)

```

```

## pid3
ces$pid3 <- factor(ces$pid3,
  levels = 1:5,
  labels = c(
    "Democrat", "Republican", "Independent",
    "Other", "Not Sure"
  )
)

## pid7
ces$pid7 <- factor(ces$pid7,
  levels = 1:7,
  labels = c(
    "Strong Democrat", "Not very strong Democrat",
    "Lean Democrat", "Independent", "Lean Republican",
    "Not very strong Republican", "Strong Republican"
  )
)

## medicare
ces$medicare <- factor(ces$medicare,
  levels = 1:2,
  labels = c("Support", "Oppose")
)

## ACA
ces$ACA <- factor(ces$ACA,
  levels = 1:2,
  labels = c("Support", "Oppose")
)

## abortion
ces$abortion <- factor(ces$abortion,
  levels = 1:2,
  labels = c("Support", "Oppose")
)

## EPA
ces$EPA <- factor(ces$EPA,
  levels = 1:2,
  labels = c("Support", "Oppose")
)

## Increase the number of police
ces$police_incr <- factor(ces$police_incr,
  levels = 1:2,
  labels = c("Support", "Oppose")
)

## Decrease the number of police
ces$police_decr <- factor(ces$police_decr,
  levels = 1:2,
  labels = c("Support", "Oppose")
)

```

```

)

## Trade Tariffs
ces$trade <- factor(ces$trade,
  levels = 1:2,
  labels = c("Support", "Oppose")
)

## Raise minimum wage
ces$minwage <- factor(ces$minwage,
  levels = 1:2,
  labels = c("Support", "Oppose")
)

## Work requirement for food stamps
ces$work_req <- factor(ces$work_req,
  levels = 1:2,
  labels = c("Support", "Oppose")
)

ces[1:2, ]

```

```

## # A tibble: 2 x 35
##   ...1 gender educ    race hispa~1 region medic~2 ACA  abort~3 EPA  polic~4
##   <dbl> <fct> <fct>    <fct> <fct> <fct> <fct> <fct> <fct> <fct>
## 1     1 Male  2-year ~ White No      North~ <NA> <NA> <NA>  Supp~ Support
## 2     2 Female Post-gr~ White No      South Support <NA> <NA>  Supp~ <NA>
## # ... with 24 more variables: police_decr <fct>, trade <fct>, minwage <fct>,
## #   work_req <fct>, residency <dbl>, pid3 <fct>, pid7 <fct>, ownhome <fct>,
## #   urbancity <fct>, unionhh <fct>, religious <fct>, ideo5 <fct>, faminc <dbl>,
## #   voted <fct>, meeting <fct>, sign <fct>, campaign <fct>, protest <fct>,
## #   contact <fct>, donate <fct>, commonweight <dbl>, age <dbl>,
## #   polengage <dbl>, faminc2 <fct>, and abbreviated variable names 1: hispanic,
## #   2: medicare, 3: abortion, 4: police_incr

```

Histogram

```

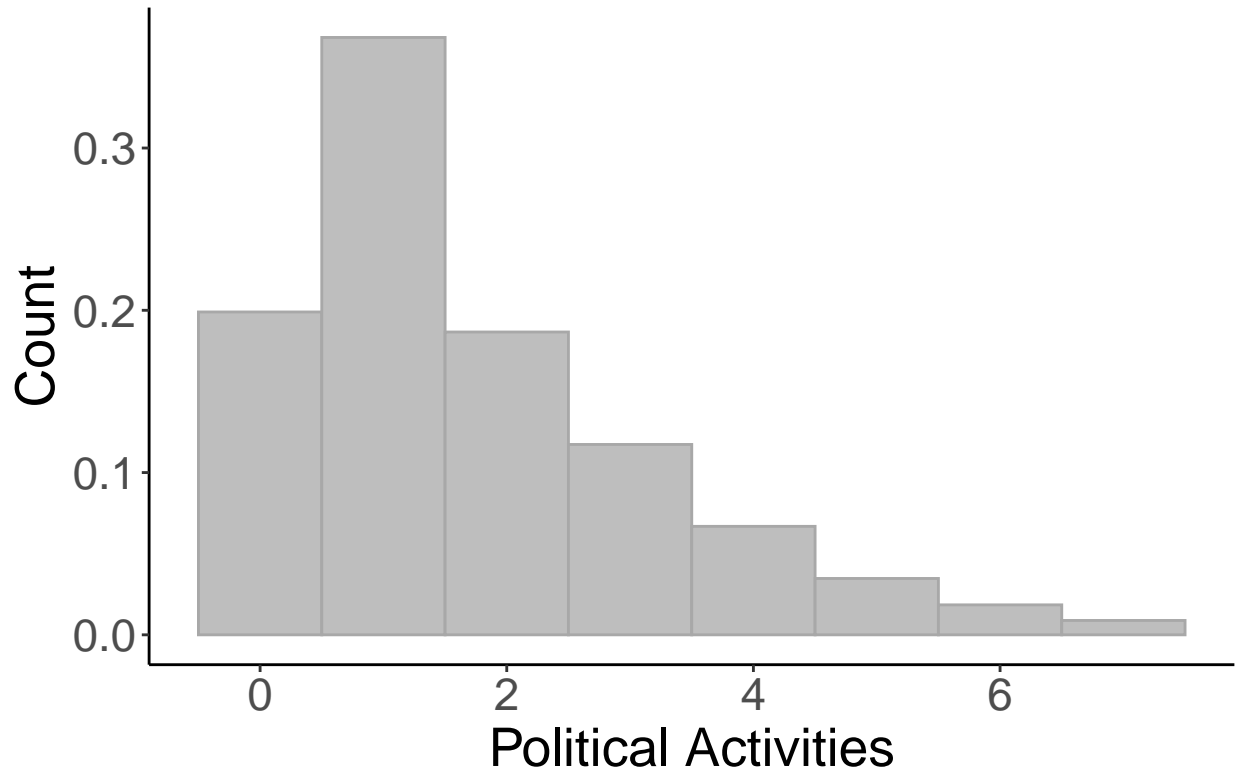
ggplot(ces, aes(polengage, y = ..density..)) +
  geom_histogram(color = "#a8a8a8", fill = "grey", binwidth = 1) +
  labs(
    title = "Figure 1: Distribution of Political Engagment",
    ## caption = "Source: Gapminder dataset",
    x = "Political Activities",
    y = "Count"
  ) +
  theme_classic() +
  theme(
    plot.title = element_text(size = 20, face = "bold"),
    plot.subtitle = element_text(size = 100, face = "bold"),
    plot.caption = element_text(face = "italic"),
    axis.title.x = element_text(size = 20),

```

```
axis.text.x = element_text(size = 17),
axis.text.y = element_text(size = 17),
axis.title.y = element_text(size = 20)
)
```

```
## Warning: Removed 9449 rows containing non-finite values (stat_bin).
```

Figure 1: Distribution of Political Engagmen



```
ggsave(filename = "hist.jpeg")
```

```
## Saving 6.5 x 4.5 in image
```

```
## Warning: Removed 9449 rows containing non-finite values (stat_bin).
```

Part 2

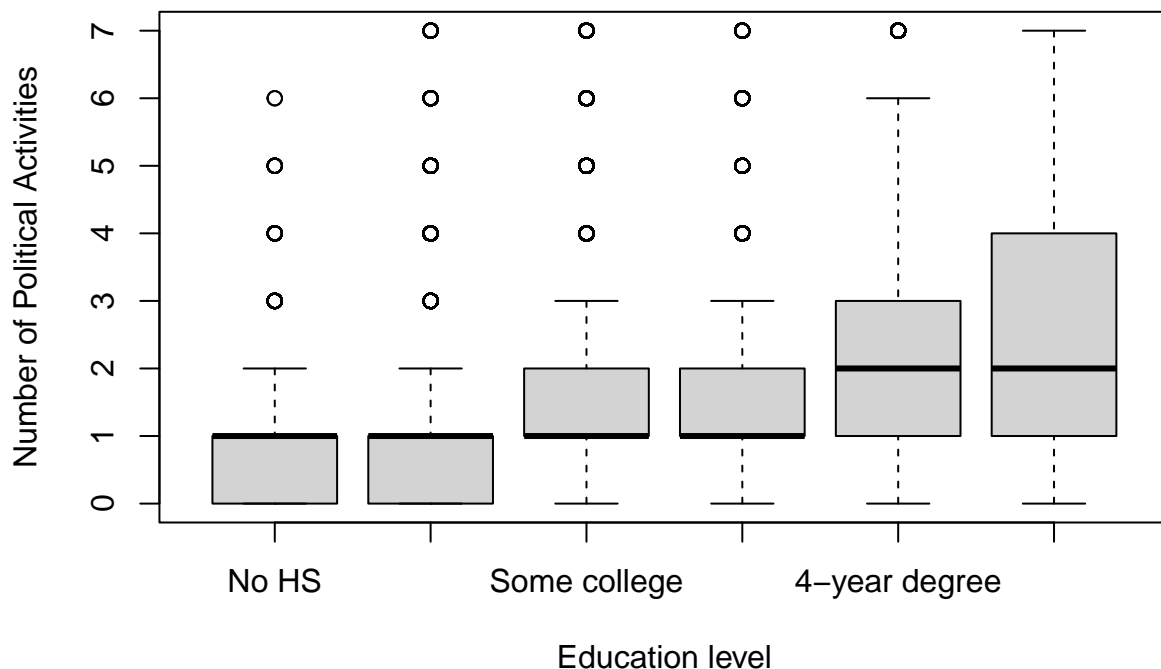
Question 1

```
## Education
Lm_educ <- lm(polengage ~ educ, data = ces)
Lm_educ
```

```
##
## Call:
## lm(formula = polengage ~ educ, data = ces)
##
## Coefficients:
##          (Intercept)      educHigh School Graduate      educSome college
##              0.8376              0.2357              0.8268
##      educ2-year degree      educ4-year degree      educPost-grad
##              0.8284              1.1835              1.6016

plot(polengage ~ educ,
     data = ces,
     xlab = "Education level",
     ylab = "Number of Political Activities",
     main = "Figure 4: Impact of Education Level on Political Participation"
)
```

Figure 4: Impact of Education Level on Political Participation



Question 2

```
ces$faminc <- (ifelse(ces$faminc == 2 | ces$faminc == 3, 2, ces$faminc))
ces$faminc <- (ifelse(ces$faminc == 4 | ces$faminc == 5, 3, ces$faminc))
ces$faminc <- (ifelse(ces$faminc == 6 | ces$faminc == 7, 4, ces$faminc))
ces$faminc <- (ifelse(ces$faminc == 8 | ces$faminc == 9, 5, ces$faminc))
ces$faminc <- (ifelse(ces$faminc == 10 | ces$faminc == 11, 6, ces$faminc))
```

```

ces$faminc <- (ifelse(ces$faminc == 12 | ces$faminc == 13, 7, ces$faminc))
ces$faminc <- (ifelse(ces$faminc == 14 | ces$faminc == 15, 8, ces$faminc))
ces$faminc <- (ifelse(ces$faminc == 16, 9, ces$faminc))
## Family income
ces$faminc <- factor(ces$faminc,
  levels = 1:9,
  labels = c(
    "< 10,000", "10,000 - 29,999", "30,000 - 49,999",
    "50,000 - 69,999", "70,000 - 99,999", "100,000 - 149,999", "150,000 - 249,999",
    "250,000 - 499,999", "500,000 or more"
  )
)

Lm_faminc <- lm(polengage ~ faminc, data = ces)
Lm_faminc

```

```

##
## Call:
## lm(formula = polengage ~ faminc, data = ces)
##
## Coefficients:
##           (Intercept)      faminc10,000 - 29,999      faminc30,000 - 49,999
##              0.9226              0.3327              0.5624
##   faminc50,000 - 69,999   faminc70,000 - 99,999   faminc100,000 - 149,999
##              0.7802              0.9724              1.2534
## faminc150,000 - 249,999 faminc250,000 - 499,999   faminc500,000 or more
##              1.4353              1.6558              1.4203

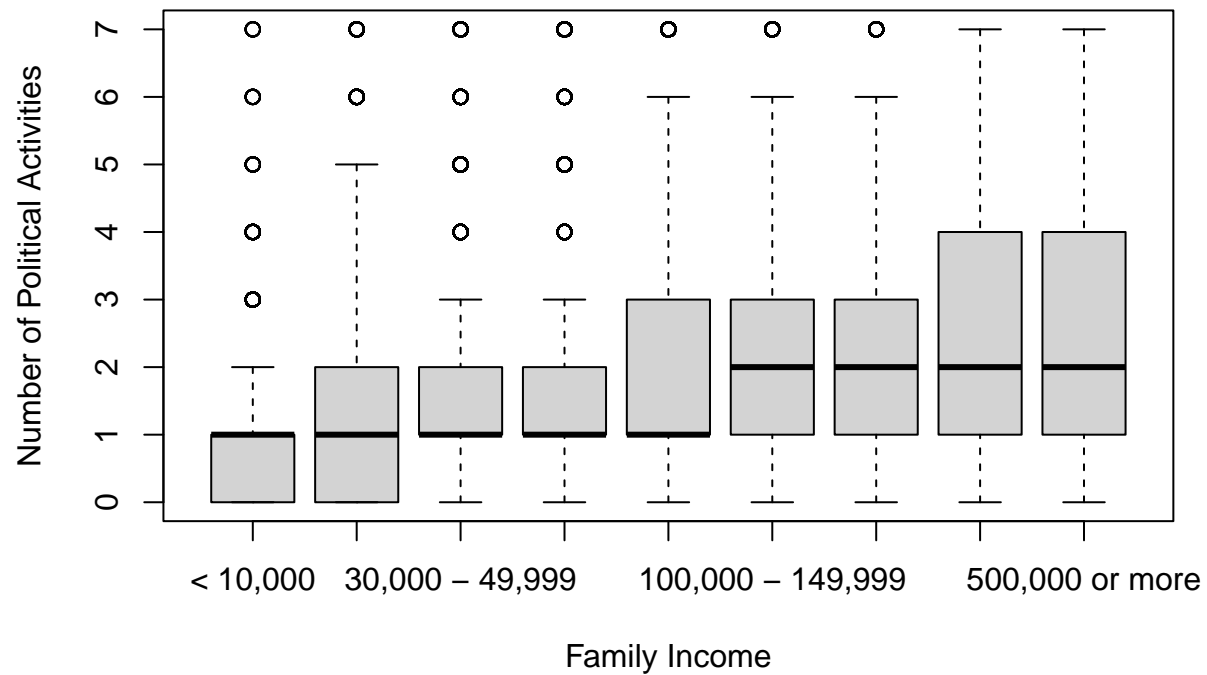
```

```

plot(polengage ~ faminc,
  data = ces,
  xlab = "Family Income",
  ylab = "Number of Political Activities",
  main = "Impact of Family Income on Political Participation"
)

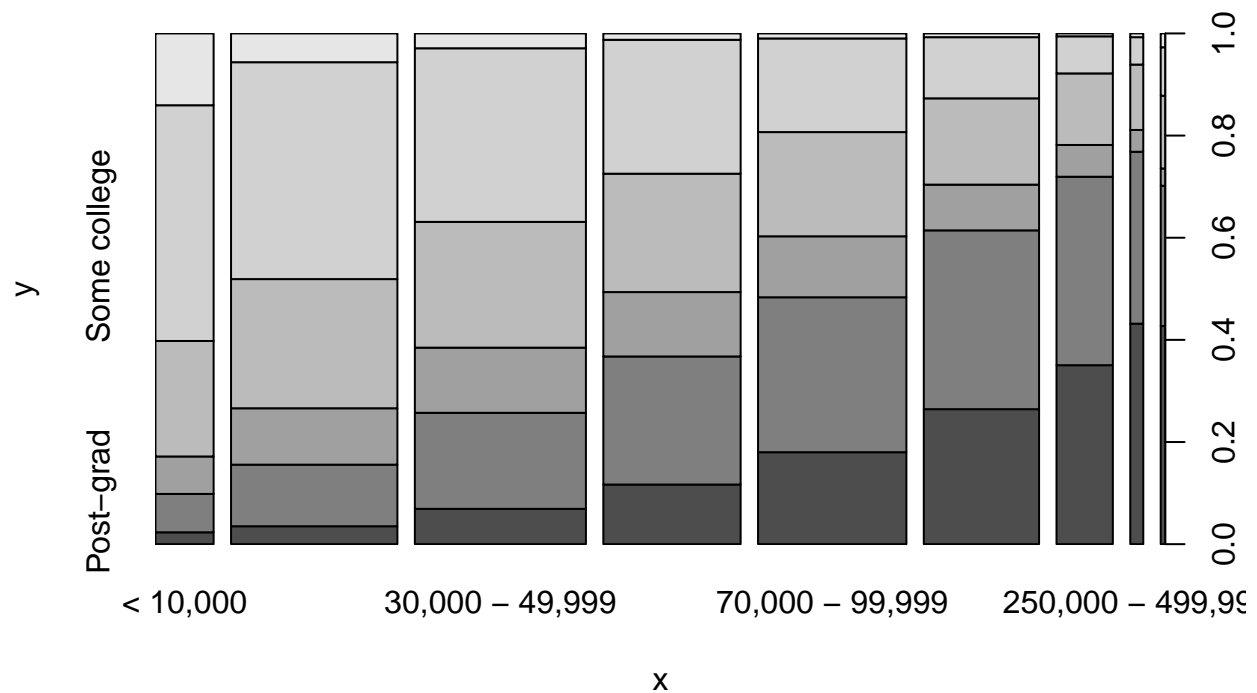
```


Impact of Family Income on Political Participation



Question 3

```
### *It would be helpful here to turn the labels back to numerical###  
plot(ces$faminc, ces$educ)
```



```
ces$educ <- as.numeric(ces$educ)
ces$faminc <- as.numeric(ces$faminc)
cor(ces$faminc, ces$educ, use = "complete.obs")
```

```
## [1] 0.4352379
```

Question 4

```
## Trying to set party identification to part of a party or not##
ces$gender <- (ifelse(ces$gender == 1, 1, 0)) # 1 if you are male, 0 if female
ces$race <- (ifelse(ces$race == 1, 1, 0)) # 1 if you are white, 0 if non-white
ces$pid3 <- (ifelse(ces$pid3 == 1 | ces$pid3 == 2, 1, 0)) # 1 if you identify as a member of a political party
Lm_our <- lm(polengage ~ gender + educ + race + faminc + pid3, data = ces)
summary(Lm_our)
```

```
##
## Call:
## lm(formula = polengage ~ gender + educ + race + faminc + pid3,
##     data = ces)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.9276 -0.9993 -0.2614  0.7386  6.1480
```

```
##
## Coefficients: (3 not defined because of singularities)
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.223591    0.020054   11.15 <2e-16 ***
## gender      NA          NA        NA      NA
## educ        0.245989    0.004862   50.60 <2e-16 ***
## race        NA          NA        NA      NA
## faminc      0.136453    0.004118   33.14 <2e-16 ***
## pid3        NA          NA        NA      NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.425 on 46615 degrees of freedom
## (14382 observations deleted due to missingness)
## Multiple R-squared:  0.1164, Adjusted R-squared:  0.1164
## F-statistic: 3071 on 2 and 46615 DF, p-value: < 2.2e-16
```