

# Gov 1372 - Hierarchies

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## Social Dominance and Politics

Welcome to the fourth Data Exploration Assignment. This week, we read about Social Dominance Theory, and its related psychological construct, Social Dominance Orientation (SDO). SDO is measured through a survey scale consisting of 16 items that we already explored in class. In this assignment, you will explore data on SDO and its relationship with other variables from a nationally representative survey fielded in 2018.

Note that the actionable part of each question is **bolded**.

### Data Details:

- File Name: `sdo_data.csv`
- Source: These data are condensed and adapted from a [survey](#) by Data for Progress in 2018 (N = 3144). The data are representative of 2018 voters.

Variable Name	Variable Description
<code>sdo5</code>	Five-point social dominance orientation (SDO) scale: 1. Minimum SDO; ...; 5. Maximum SDO
<code>female</code>	Indicator for whether or not the respondent is female. Coded 1 if respondent is female, 0 otherwise.
<code>birthyr</code>	Respondent's birth year
<code>educ</code>	Education: 1. Didn't graduate HS; 2. HS graduate; 3. Some college; 4. 2-year college; 5. 4-year college; 6. Postgraduate degree
<code>race</code>	Race: 1. White; 2. Black or African-American; 3. Hispanic or Latino; 4. Asian or Asian-American; 5. Native American; 6. Mixed Race; 7. Other; 8. Middle Eastern
<code>favor_trump</code>	Favorability of Donald Trump: 1. very unfavorable; ...; 4. very favorable
<code>favor_blm</code>	Favorability of Black Lives Matter: 1. very unfavorable; ...; 4. very favorable
<code>favor_metoo</code>	Favorability of the Me Too movement: 1. very unfavorable; ...; 4. very favorable
<code>american_customs</code>	"The growing number of newcomers from other countries threatens traditional American customs and values": 1. Strongly disagree; ...; 5. Strongly agree
<code>race_ident</code>	"How important is being [respondent's race] to you?": 1. Not at all important; ...; 4. Very important

Variable Name	Variable Description
pid3	Three-category party identification: 1. Democrat; 2. Independent; 3. Republican
ideo5	Five-category political ideology: 1. Very liberal; ...; 5. Very conservative
fear_of_demographic_change	Fear of demographic change in the US: 0. Least fearful; ...; 1. Most fearful
confederate_flag	Is the Confederate flag mostly a symbol of slavery and white supremacy or Southern heritage and culture? Coded either "slavery" or "heritage"
presvote16	Vote choice in the 2016 presidential election

## Question 1: REQUIRED

Before looking at data, the science of political psychology often involves building surveys. The teaching team builds the surveys you take using an online survey-building software called Qualtrics. This is often the same software that researchers use to build surveys and collect data that is eventually published in peer-reviewed journals. In this question, you'll create your own brief survey.

**THIS QUESTION IS REQUIRED FOR ALL STUDENTS. Go to [harvard.qualtrics.com](https://harvard.qualtrics.com) and log in using your HarvardKey. Click "Create new project", then select "Survey". You can name your survey whatever you like. Leave the other two drop-down options at their default and click "Create project". Now you can input the SDO scale, which is given below. Make sure to include all 16 items, split into two sub-scales, in your survey. They are split into two sub-scales here, but they don't need to be in your survey. For each item, there should be seven response categories: Strongly favor, Somewhat favor, Slightly favor, Neutral, Slightly oppose, Somewhat oppose, Strongly oppose. Think about the format you think is best for these questions, available under "Question Type". How might the format of the questions affect the responses you get from the survey, or the experience respondents have while taking the survey? Also consider question ordering and how that may also affect the responses. BE SURE TO UPLOAD A SCREENSHOT OF YOUR QUALTRICS SURVEY TO YOUR BLOG THIS WEEK.**

### Dominance Sub-Scale

1. Some groups of people must be kept in their place.
2. It's probably a good thing that certain groups are at the top and other groups are at the bottom.
3. An ideal society requires some groups to be on top and others to be on the bottom.
4. Some groups of people are simply inferior to other groups.
5. Groups at the bottom are just as deserving as groups at the top.
6. No one group should dominate in society.
7. Groups at the bottom should not have to stay in their place.
8. Group dominance is a poor principle.

### Anti-Egalitarianism Sub-Scale

1. We should not push for group equality.

2. We shouldn't try to guarantee that every group has the same quality of life.
3. It is unjust to try to make groups equal.
4. Group equality should not be our primary goal.
5. We should work to give all groups an equal chance to succeed.
6. We should do what we can to equalize conditions for different groups.
7. No matter how much effort it takes, we ought to strive to ensure that all groups have the same chance in life.
8. Group equality should be our ideal.

## Question 2

Now let's take a look at the data.

```
sdo <- read_csv("sdo_data.csv")

##
## -- Column specification -----
## cols(
##   sdo5 = col_double(),
##   female = col_double(),
##   age = col_double(),
##   educ = col_double(),
##   race = col_double(),
##   favor_trump = col_double(),
##   favor_blm = col_double(),
##   favor_metoo = col_double(),
##   american_customs = col_double(),
##   race_ident = col_double(),
##   pid3 = col_double(),
##   ideo5 = col_double(),
##   fear_of_demographic_change = col_double(),
##   confederate_flag = col_character(),
##   presvote16 = col_character()
## )
```

What is the distribution of social dominance orientation in the sample? Make a plot, and report the mean and standard deviation of SDO in the sample. Extend this problem by splitting the plot by party ID of the respondent. Comment on what you find.

```
labels <- c("1" = "Democrat",
           "2" = "Republican",
           "3" = "Independent")

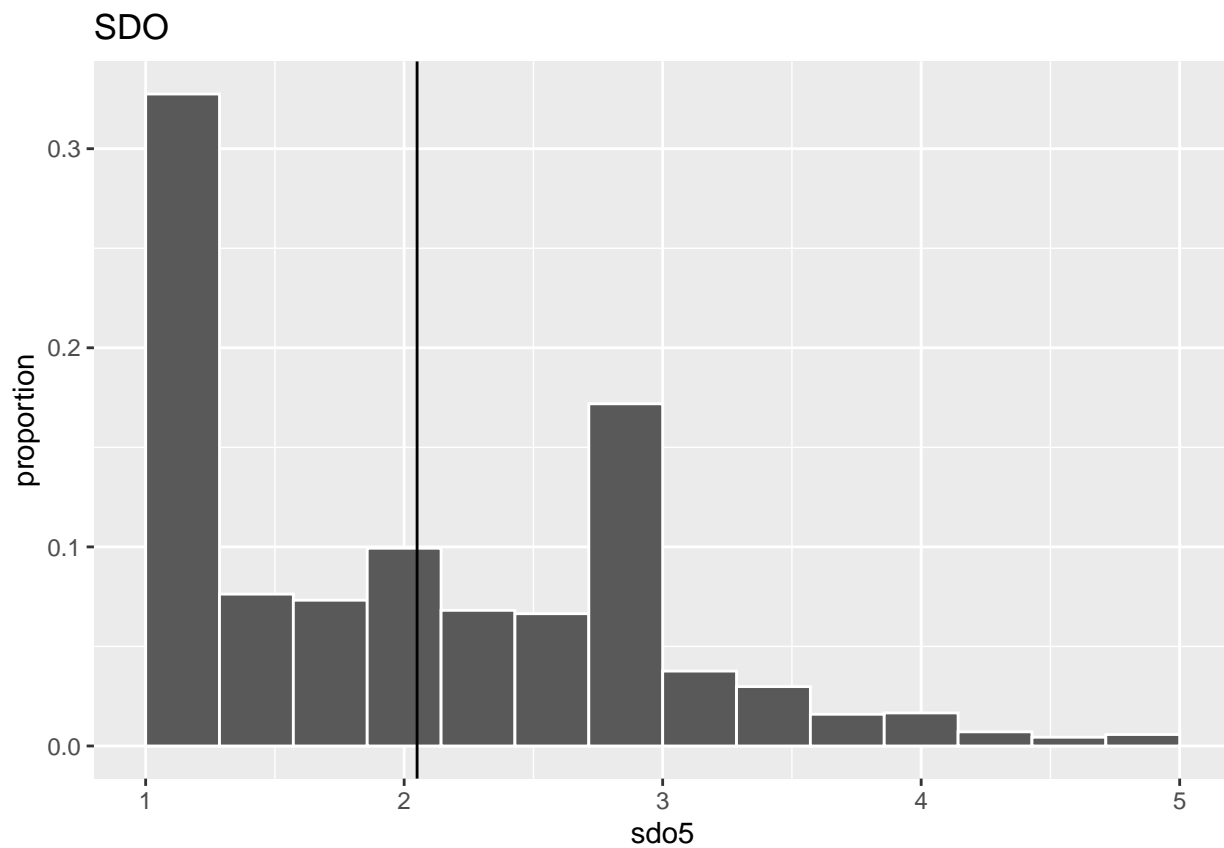
sdo <- sdo %>%
  group_by(pid3) %>%
  mutate(x_int = mean(sdo5),
         party = case_when(pid3 == 1 ~ "Democrat",
                           pid3 == 2 ~ "Republican",
```

```

                                pid3 == 3 ~ "Independent")) %>%
  ungroup()

sdo %>%
  filter(is.na(pid3) == FALSE) %>%
  ggplot(aes(x = sdo5)) +
    geom_histogram(aes(y = after_stat(count/sum(count))),
                   bins = 15, color = "white") +
    geom_vline(aes(xintercept = 2.05)) +
    labs(x = "sdo5", y = "proportion", title = "SDO")

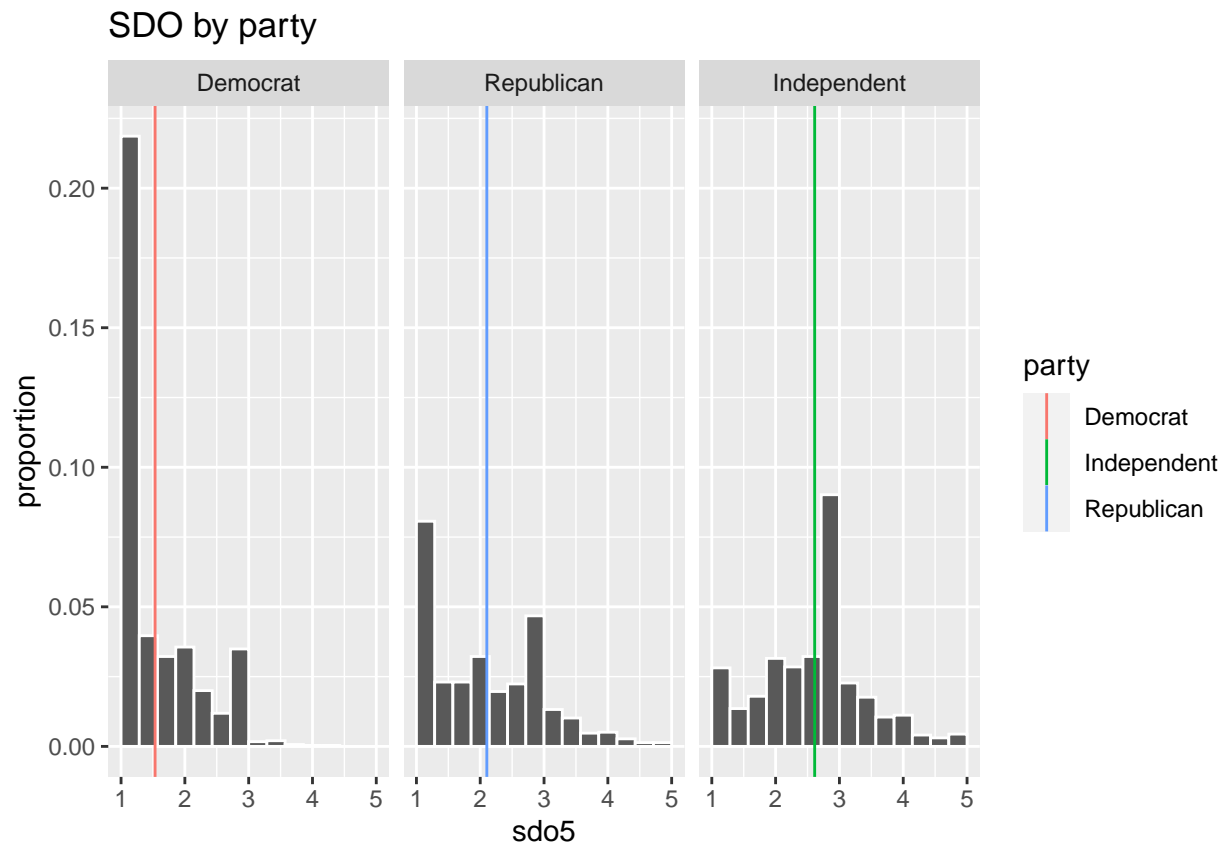
```



```

sdo %>%
  filter(is.na(pid3) == FALSE) %>%
  ggplot(aes(x = sdo5)) +
    geom_histogram(aes(y = after_stat(count/sum(count))),
                   bins = 15, color = "white") +
    geom_vline(aes(xintercept = x_int, color = party)) +
    # geom_text(label = "Mean = 2.05", x = mean(sdo$sdo5), y = 600) +
    facet_wrap("pid3", labeller = as_labeller(labels)) +
    labs(x = "sdo5", y = "proportion", title = "SDO by party")

```



```
sdo %>%
  summarize(mean = mean(sdo5), standard_deviation = sd(sdo5))
```

```
## # A tibble: 1 x 2
##   mean standard_deviation
##   <dbl>          <dbl>
## 1  2.05          0.921
```

```
sdo %>%
  group_by(party) %>%
  summarize(mean = mean(sdo5), standard_deviation = sd(sdo5), .groups = "drop")
```

```
## # A tibble: 4 x 3
##   party      mean standard_deviation
##   <chr>    <dbl>          <dbl>
## 1 Democrat  1.53          0.662
## 2 Independent 2.61          0.844
## 3 Republican 2.10          0.905
## 4 <NA>      2.29          0.968
```

### Question 3

In the reading for this week, we saw that gender is central to social dominance theory, which predicts that men tend to have higher SDO than women do. **Is this true in this sample as well? Report the average**

SDO for men and women. Comment on what you find. Extend this question by reporting the difference in means along with the p-value. Is the difference significant at a .05 significance level?

```
sdo %>%
  group_by(female) %>%
  summarize(mean_sdo = mean(sdo5))

## 'summarise()' ungrouping output (override with '.groups' argument)

## # A tibble: 2 x 2
##   female mean_sdo
##   <dbl>   <dbl>
## 1     0     2.19
## 2     1     1.94

lm_sdo_female <- lm(data = sdo, sdo5 ~ female)
summary(lm_sdo_female)

##
## Call:
## lm(formula = sdo5 ~ female, data = sdo)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.1897 -0.9382 -0.1882  0.8103  3.0618
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2.18969    0.02415   90.688 < 2e-16 ***
## female      -0.25153    0.03270  -7.692 1.93e-14 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9131 on 3142 degrees of freedom
## Multiple R-squared:  0.01848,    Adjusted R-squared:  0.01817
## F-statistic: 59.16 on 1 and 3142 DF,  p-value: 1.93e-14
```

## Question 4

What is the correlation between `sdo5` and the `favor_trump` variable? Is the correlation statistically different from zero? You can use `cor.test()` for this question. Interpret what you find. If you want, extend this question by creating a scatterplot with the line of best fit to visualize the relationship. You can use `geom_point()` in the `ggplot` architecture for this.

```
lm_sdo_trump <- lm(data = sdo, sdo5 ~ favor_trump)
summary(lm_sdo_trump)

##
## Call:
## lm(formula = sdo5 ~ favor_trump, data = sdo)
```

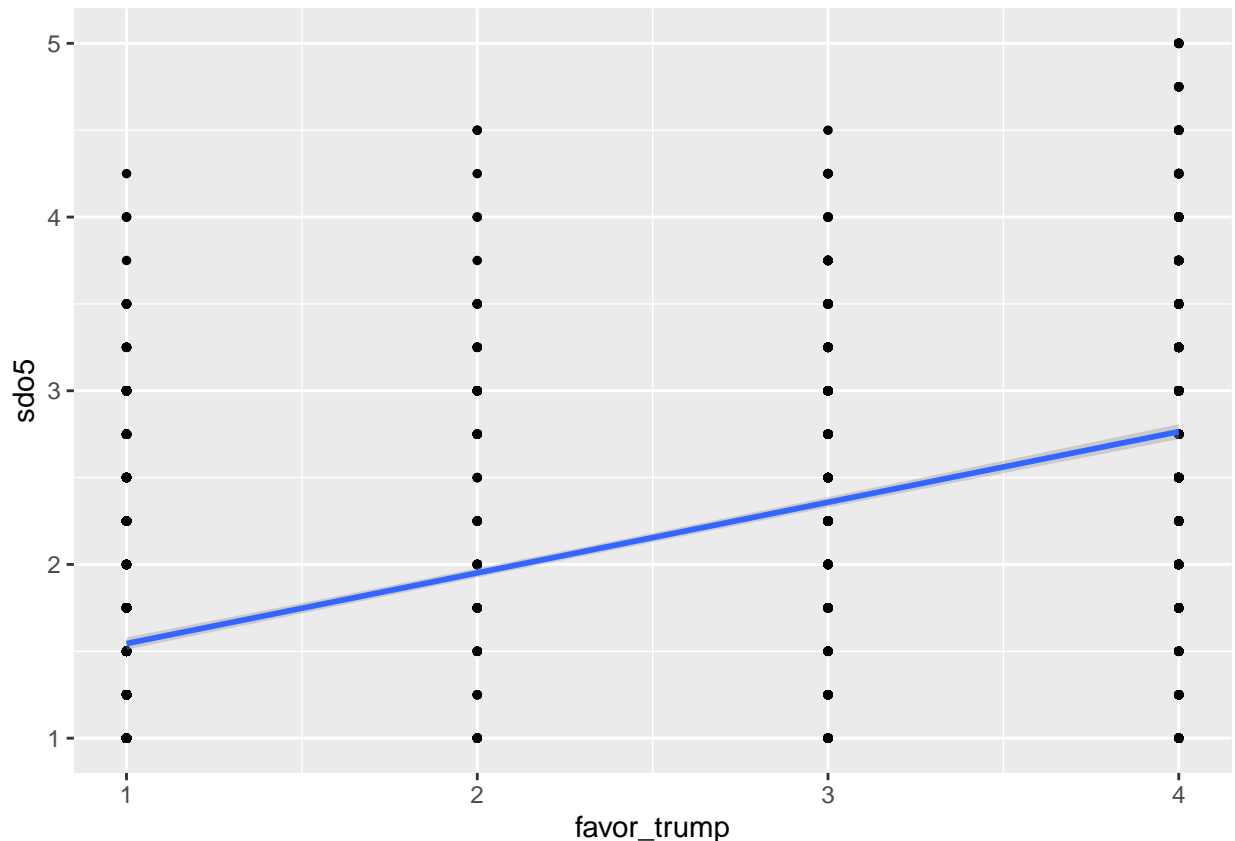
```
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.76457 -0.54461 -0.04461  0.45539  2.70539
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.137960   0.025791   44.12  <2e-16 ***
## favor_trump  0.406653   0.009859   41.25  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.7415 on 3111 degrees of freedom
## (31 observations deleted due to missingness)
## Multiple R-squared:  0.3535, Adjusted R-squared:  0.3533
## F-statistic: 1701 on 1 and 3111 DF, p-value: < 2.2e-16
```

```
sdo %>%
  ggplot(aes(x = favor_trump, y = sdo5)) +
    geom_point(size = 1) +
    geom_smooth(method = "lm")
```

```
## 'geom_smooth()' using formula 'y ~ x'
```

```
## Warning: Removed 31 rows containing non-finite values (stat_smooth).
```

```
## Warning: Removed 31 rows containing missing values (geom_point).
```



### Question 5

Correlation matrices, like the one below, are useful for visualizing the pairwise relationships between several variables. They allow you to see the correlation coefficients of many relationships at once. **Plot a correlation matrix of the correlation between SDO and some of the variables you think might be related to SDO and to each other. Choose at least 3 variables in addition to SDO. Before you make your plot, briefly discuss why you think the variables might all be related. The package `ggcorrplot` may be useful here. Discuss what you see in your plot.**

Here is an example of what your correlation plot might look like, using the `ggcorrplot` package:

### Question 6: Data Science Question

In this next question, we will use regression to model vote choice as a function of SDO and other variables of interest. This will help us get a fuller picture of the impact of social dominance orientation on political attitudes. We will fit the following model:

You'll notice that the variable `white` doesn't exist in our data set. When doing regression analysis, researchers often code race as a binary - for example, 1 for white and 0 for all non-white. This is done largely to make the regression results easier to interpret. Without turning race into a binary variable, the regression model would instead have several binary variables corresponding to each racial category (e.g. 1 for Black, 0 otherwise; 1 for Hispanic, 0 otherwise, etc.) which can quickly become unwieldy. Try it both ways if you are interested in seeing the difference (though you'll need to turn the `race` variable to a factor).

We also need to adjust the vote choice variable. Currently, `presvote16` codes vote choice for any party in the 2016 election (Dem, Rep, Green, Libertarian) as well as votes for others. This, too, would become



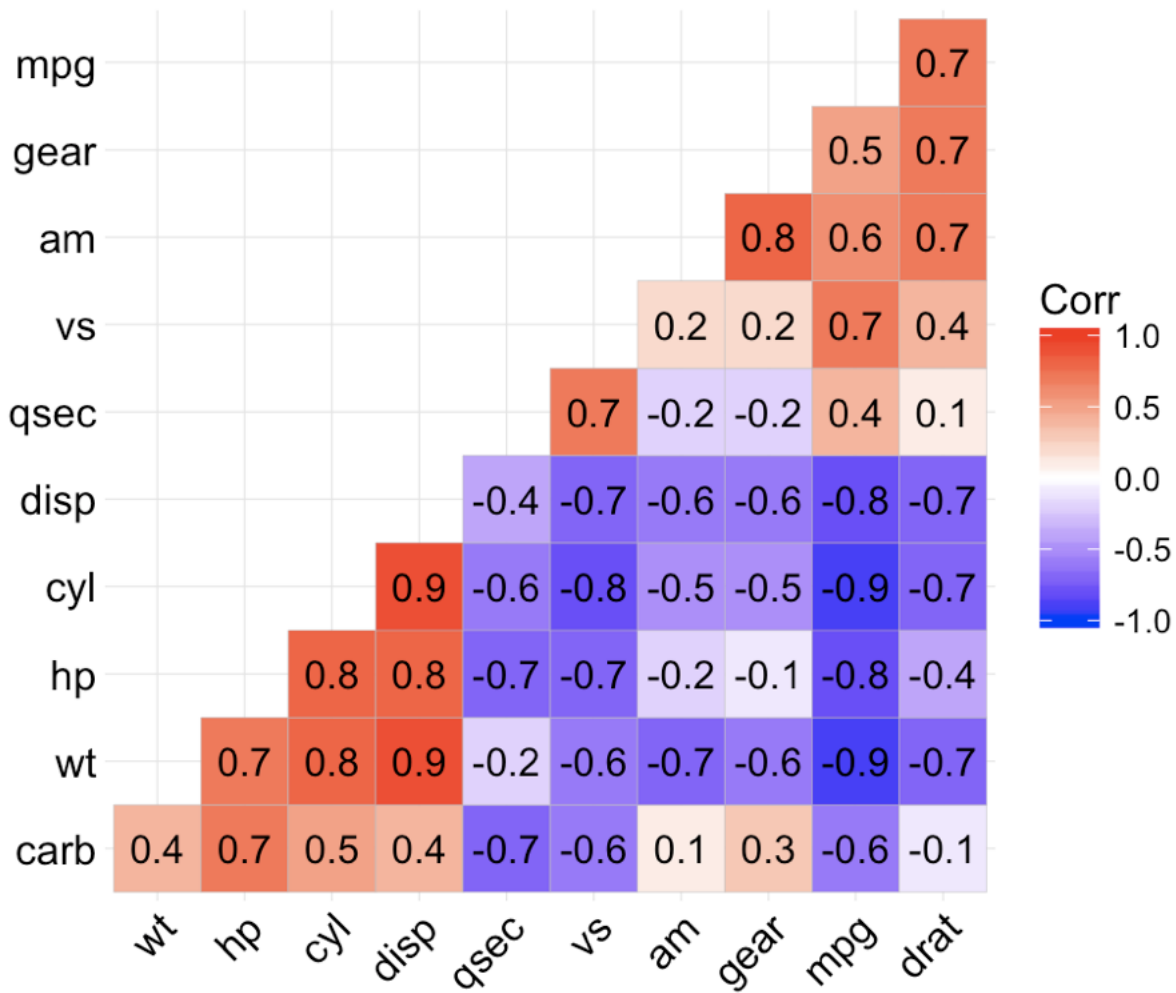


Figure 1: Example correlation plot.

unwieldy in a regression. To simplify, we will turn this into an indicator variable for whether or not the respondent voted for the Republican (Donald J. Trump), called `rep_vote`. To be clear, `rep_vote` should be 1 if the respondent voted for Trump, 0 if they voted for someone else, and NA if they did not vote.

**First, create the `white` variable from the `race` variable, as well as `rep_vote` from `presvote16`. Then, fit the linear model described above. Comment on what you see. Is this in line with what we would expect based on social dominance theory? Interpret your results and comment on what you find, especially as it relates to social dominance theory. Note that you can explore other model specifications in the next question.**

The model seems to be in line with what we would expect to see based on SDT. SDO and voting for Trump are positively correlated. People who voted for Trump were presumably more conservative and more aligned with the Republican party, so you'd expect voting for Trump to also be positively correlated with `pid3` and `ideo5`, which the model confirms. Sidanius and Pratto made the same argument, that political conservatism and its associated hierarchy enhancing legitimizing myths are more aligned with high SDO. If we're accepting that higher SDO corresponds with a higher propensity to vote for Trump, you'd also expect female to be negatively correlated with the response variable. But the female variable also illustrates how this model might be using too much information to explain votes for Trump. I could see how female, white, educ, `pid3` and `ideo5` are all related in some way, so by choosing `rep_vote` as the response variable, we might just be demonstrating that all of these variables are somehow related and as a result overfitting the model.

I think the correlation matrix like the one below might be a better way to visually represent this web of relationships, since you can break down exactly how variables are relating to each other. In terms of how SDO relates to the other variables given the ideas laid out in SDT, the correlation matrix above agrees with Sidanius and Pratto's arguments.

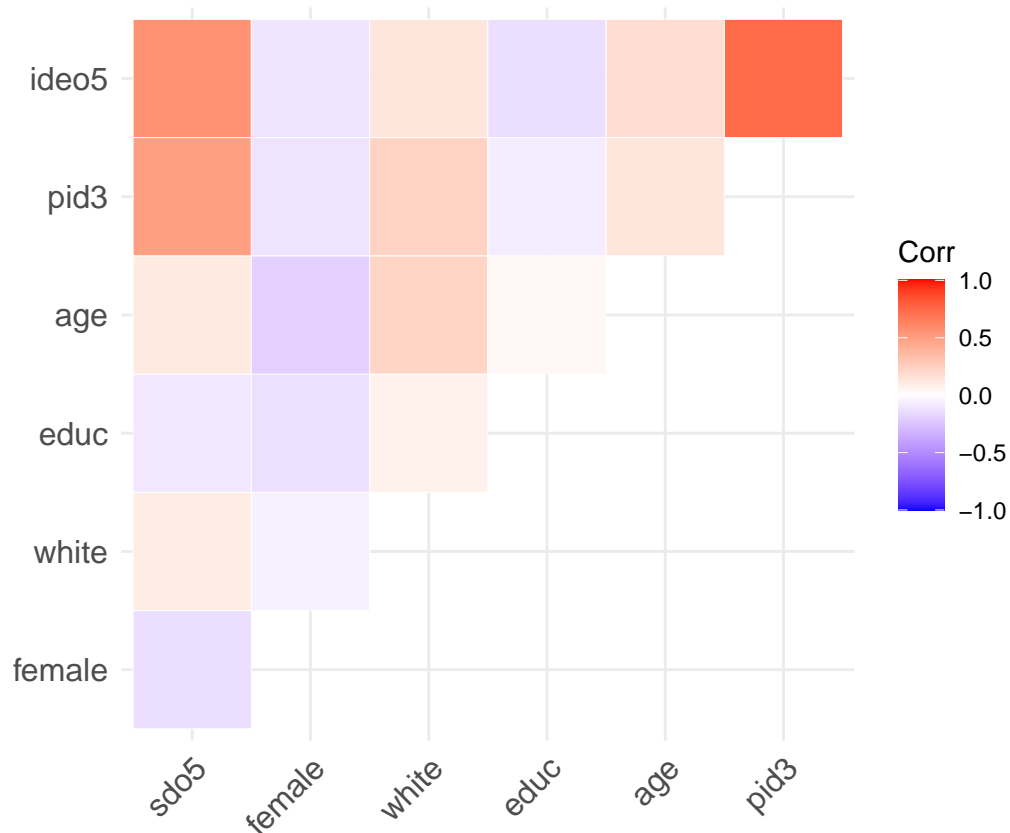
```
sdo_model <- sdo %>%
  mutate(white = ifelse(race == 1, 1, 0),
         rep_vote = case_when(presvote16 == "Trump" ~ 1,
                              presvote16 == "Did not vote" ~ NA_real_,
                              T ~ 0))
lm_rep_vote <- lm(data = sdo_model, rep_vote ~ sdo5 + female + white + educ + age + pid3 + ideo5)
summary(lm_rep_vote)
```

```
##
## Call:
## lm(formula = rep_vote ~ sdo5 + female + white + educ + age +
##      pid3 + ideo5, data = sdo_model)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.09529 -0.13502  0.02188  0.14140  1.07451
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.645980   0.034124 -18.931  < 2e-16 ***
## sdo5         0.092730   0.007164  12.945  < 2e-16 ***
## female      -0.001911   0.011185  -0.171  0.864354
## white        0.043412   0.014899   2.914  0.003599 **
## educ        -0.017125   0.004104  -4.173  3.1e-05 ***
## age          0.001490   0.000391   3.811  0.000142 ***
## pid3         0.264150   0.009916  26.639  < 2e-16 ***
## ideo5        0.110520   0.006664  16.585  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 0.2809 on 2742 degrees of freedom
## (394 observations deleted due to missingness)
## Multiple R-squared: 0.681, Adjusted R-squared: 0.6802
## F-statistic: 836.2 on 7 and 2742 DF, p-value: < 2.2e-16
```

```
corr <- sdo_model %>%
  select(sdo5, female, white, educ, age, pid3, ideo5) %>%
  drop_na() %>%
  cor()

ggcorrplot(corr, type = "upper", outline.color = "white")
```



## Question 7

Lastly, just explore the data! This question is open-ended, but make sure you have a theoretical expectation in mind for any relationships between variables you want to explore, and include them in your answer.