Problem Set 5

Anna Weiner

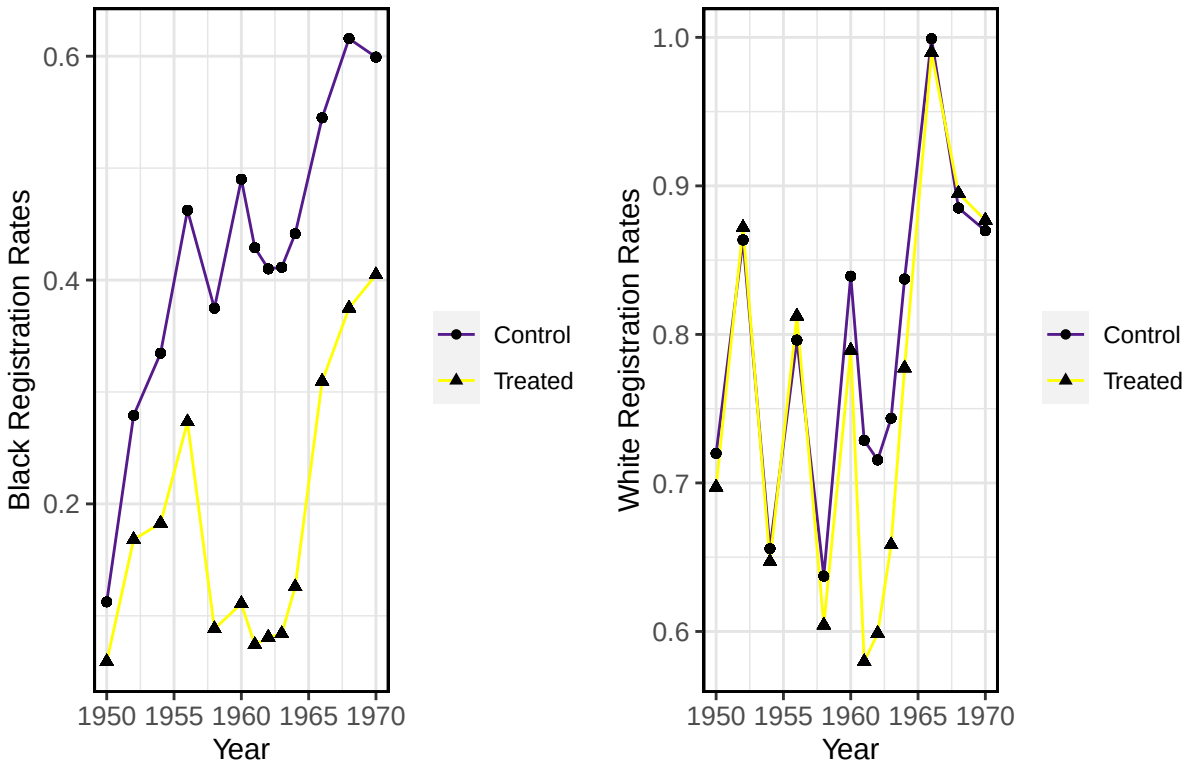
2024-03-18

Problem 1: Replication of Figure 2

```
df =
  read_dta("~/Downloads/Programming/Problem-Set-5/la_turnout_basic.dta")

df1 =
  df |>
  mutate(
    uc = FctWhen(
      understandingclause2 == 0 ~ 'Control',
      understandingclause2 == 1 ~ 'Treated'
    ),
  ) |>
  filter(
    year >= 1950 & year <= 1970
  ) |>
  filter(!is.na(whiteregrate)) |>
  filter(!is.na(blackregrate))


df2 = df1 |>
  group_by(year, uc == 'Control') |>
  mutate(
      blackavg = mean(blackregrate, na.rm = T),
      whiteavg = mean(whiteregrate, na.rm = T)
  )

palette_ugly = c('purple4', 'yellow')

blackreg = df2 |>
  ggplot(
    aes(
      x = year,
```

```
      y = blackavg,
      shape = uc,
      color = uc
    )
  ) +
  geom_line() +
  geom_point(color = "black")  +
  labs(
    caption = "(a) Black Registration",
    x = "Year",
    y = "Black Registration Rates"
  ) +
  scale_x_continuous(
    breaks = seq(1950, 1970, by = 5)
    )  +
  theme(legend.position = "right",
        legend.title = element_blank(),
        plot.caption = element_text(hjust = 0.5,
                                    size = 13),
        panel.grid.major = element_line(color = 'grey90'),
        panel.grid.minor = element_line(color = 'grey90'),
        panel.background = element_blank(),
        legend.background = element_rect(fill = 'white', size = .5),
        axis.text.y   = element_text(size=10),
        axis.text.x   = element_text(size=10),
        panel.border = element_rect(color = 'black', fill = NA, size = 1)
        ) +
  scale_color_manual(values = palette_ugly)

whitereg = df2 |>
  ggplot(
    aes(
      x = year,
      y = whiteavg,
      shape = uc,
      color = uc
    )
  ) +
  geom_line() +
  geom_point(color = "black")  +
  labs(
    caption = "(b) White Registration",
    x = "Year",
    y = "White Registration Rates"
```

```
  ) +
  scale_x_continuous(
    breaks = seq(1950, 1970, by = 5)
  )  +
  theme(legend.position = "right",
        legend.title = element_blank(),
        plot.caption = element_text(hjust = 0.5,
                                    size = 13),
        panel.grid.major = element_line(color = 'grey90'),
        panel.grid.minor = element_line(color = 'grey90'),
        panel.background = element_blank(),
        legend.background = element_rect(fill = 'white', size = .5),
        axis.text.y   = element_text(size=10),
        axis.text.x   = element_text(size=10),
        panel.border = element_rect(color = 'black', fill = NA, size = 1)
  ) +
  scale_color_manual(values = palette_ugly)

blackreg + whitereg
```

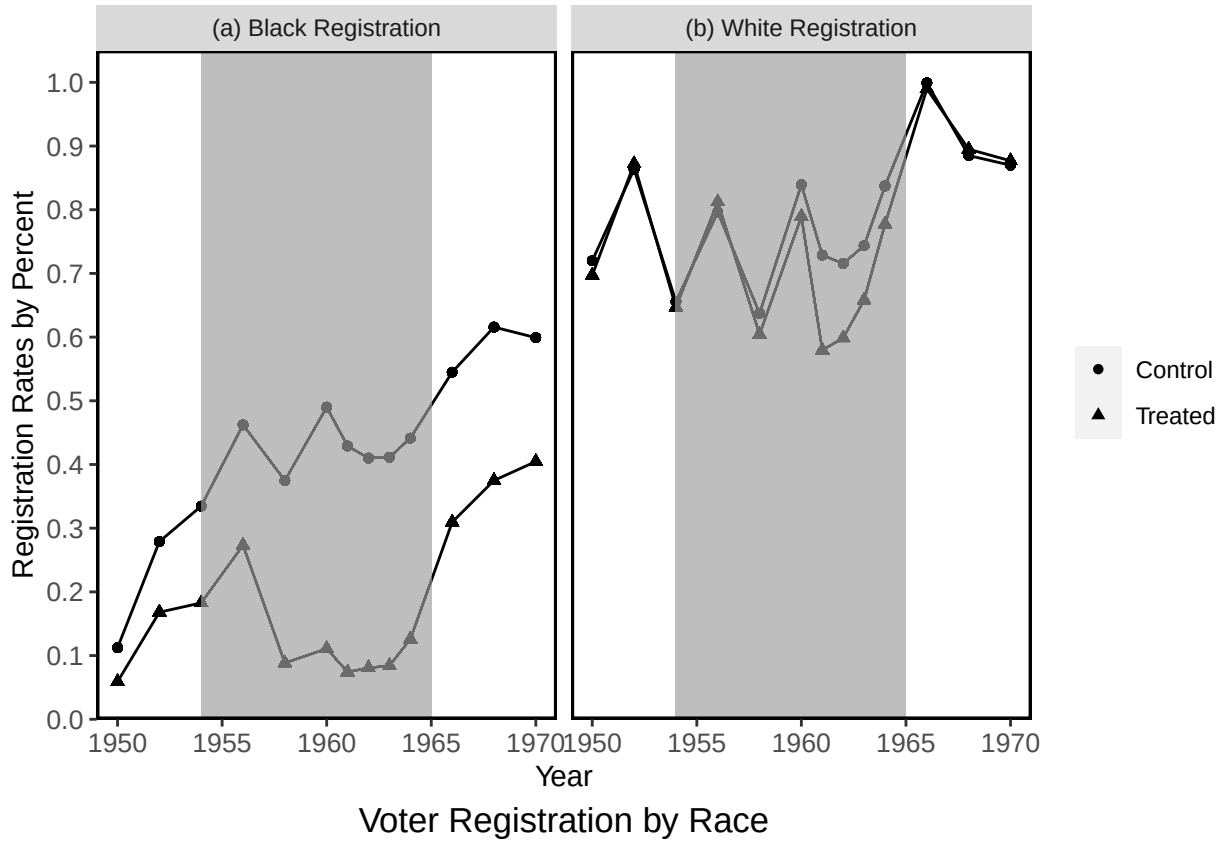


(a) Black Registration (b) White Registration

Problem 2: Improving Figure 2

```
df3 = df2 |>
  select(
    year,
    Parish,
    uc,
    blackavg,
    whiteavg
  ) |>
  pivot_longer(
    cols = blackavg:whiteavg,
    names_to = 'avg',
    values_drop_na = TRUE
  )

names = list(
  "blackavg" = "(a) Black Registration",
  "whiteavg" = "(b) White Registration"
)

tab = df3 |>
  ggplot(aes(x = year, y = value, shape = uc, fill = uc)) +
  facet_wrap(~ avg, ncol = 2, labeller = variable_labeller) +
  geom_line() +
  geom_point(color = "black")  +
  geom_rect(aes(xmin = 1954,
                xmax = 1965,
                ymin = 0,
                ymax = Inf),
            alpha=0.01,
            fill="grey") +
  labs(
    caption = "Voter Registration by Race",
    x = "Year",
    y = "Registration Rates by Percent"
  ) +
  scale_x_continuous(
    breaks = seq(1950, 1970, by = 5)
  )  +
  scale_y_continuous(
    expand = expansion(mult = c(0, 0.05)),
    breaks = seq(0, 1, by = 0.1)
  ) +
  coord_cartesian(ylim = c(0, 1)) +
  theme(legend.position = "right",
```

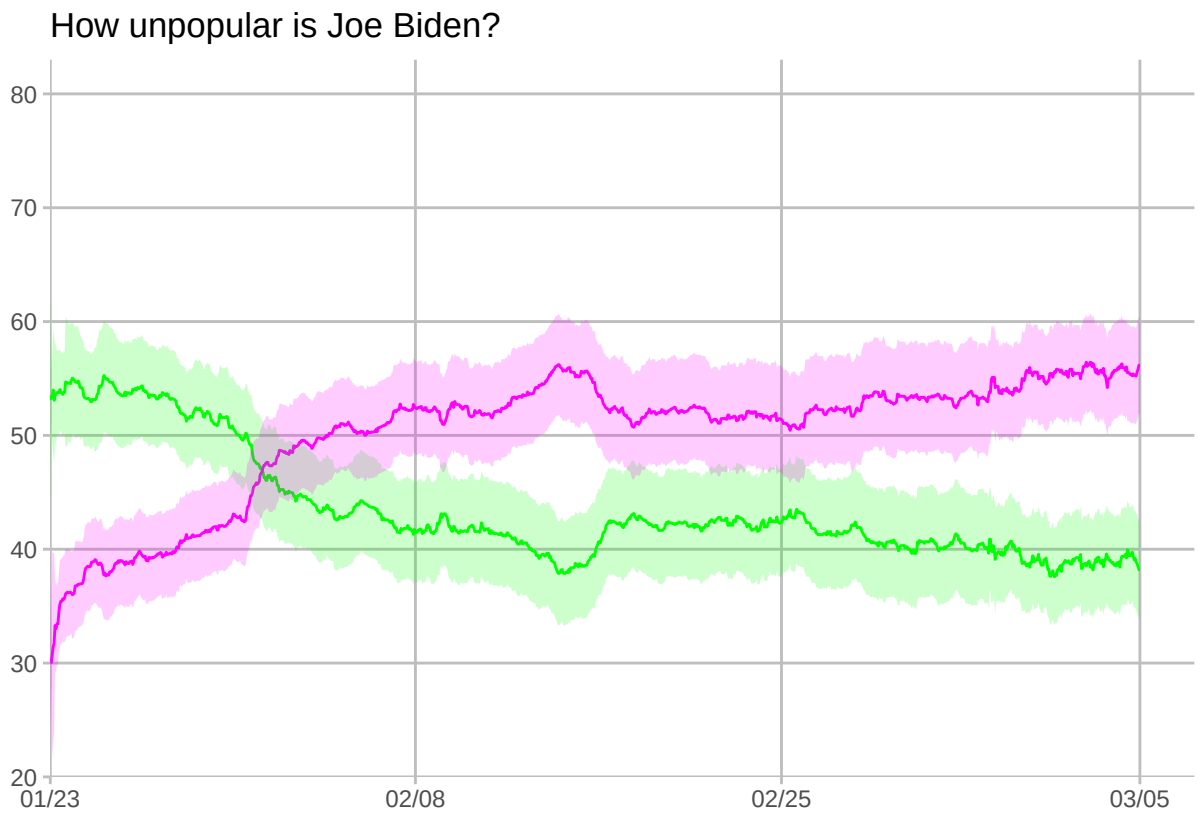
```
        legend.title = element_blank(),
        plot.caption = element_text(hjust = 0.5,
                                    size = 13),
        panel.grid.major = element_blank(),
        panel.grid.minor = element_blank(),
        panel.background = element_blank(),
        legend.background = element_rect(),
        axis.title.x = element_text(
          size = 11
        ),
        axis.title.y = element_text(
          size = 11
        ),
        axis.text.y = element_text(
          size = 10),
        axis.text.x = element_text(
          size = 10),
        panel.border = element_rect(color = 'black',
                                    fill = NA,
                                    size = 1)
  )
tab
```



Extra Credit: FiveThirtyEight Chart

```
topline = read_csv("approval_topline.csv")
poll_list = read_csv("approval_polllist.csv")

fivethirty = topline |>
  ggplot(
    aes(
      x = end_date
    )
  ) +
  geom_line(aes(y = approve_estimate), color = 'green') +
  geom_line(aes(y = disapprove_estimate), color = 'magenta') +
  labs(
    title = "How unpopular is Joe Biden?",
    x = " ",
    y = " "
  ) +
  scale_x_date(date_labels = "%m/%d",
               expand = expansion(mult = c(0, 0.05)),
               breaks = as.Date(c('2021-01-23', '2022-02-08', '2023-02-25', '2024-03-05'
```

```
                ) +
  scale_y_continuous(
    expand = expansion(mult = c(0, 0.05)),
    breaks = seq(20, 80, by = 10),
    limits = c(20, 80)
  ) +
  theme(
    panel.grid.major = element_line(color = 'grey'),
    panel.grid.minor = element_blank(),
    panel.background = element_blank(),
    axis.ticks = element_line(color = 'grey')
  )

fivethirty + geom_ribbon(
  aes(ymin = topline$approve_lo,
      ymax = topline$approve_hi,
      fill = 'green',
      linetype = NA),
  alpha = .2) +
  geom_ribbon(
    aes(ymin = topline$disapprove_lo,
        ymax = topline$disapprove_hi,
        fill = 'magenta',
        linetype = NA),
    alpha = .2) +
  scale_fill_manual(values=c("green", "magenta")) +
  guides(fill = FALSE)
```


How unpopular is Joe Biden?
80
70
60
50
40
30
20
01/23
02/08
02/25
03/05