

# Problem Set 5

Bern DySart

2024-03-18

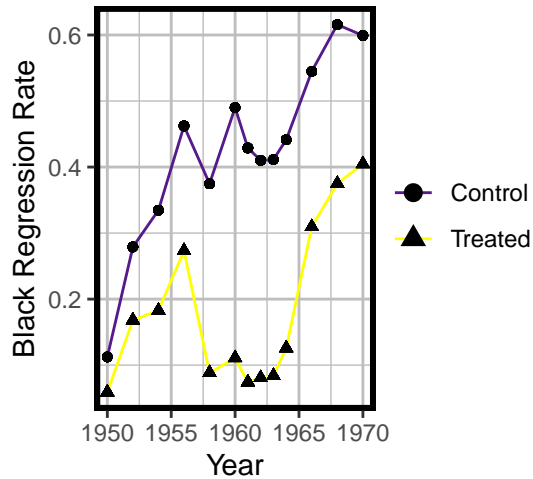
1. See Recreation Below

```
Black =  
  laturnout |>  
  group_by(year, UnderstandingClause) |>  
  mutate(  
    across(where(is.labelled), as_factor),  
    brrate = mean(blackregrate, na.rm = TRUE),  
  ) |>  
  filter(between(year, 1950, 1970)) |>  
  ggplot(aes(x = year,  
             y = brrate,  
             group = UnderstandingClause)  
        ) +  
  geom_line(aes(  
    colour = UnderstandingClause  
  )) +  
  geom_point(aes(  
    shape = UnderstandingClause  
  )) +  
  scale_colour_manual(  
    values = c("Control" = "purple4", "Treated" = "yellow1")  
  ) +  
  labs(  
    y = "Black Regression Rate",  
    x = "Year",  
    caption = "(a) Black Registration"  
  ) +  
  guides(  
    shape = guide_legend(  
      override.aes = list(size = 3)  
    )  
  ) +  
  theme(  
    legend.title = element_blank(),  
    legend.box.spacing = unit(0, "pt"),  
    legend.key = element_blank(),  
    plot.caption = element_text(hjust = 0.5, size = 12, family = "Times New Roman"),  
    panel.background = element_blank(),  
    panel.grid = element_line(colour = "grey"),
```

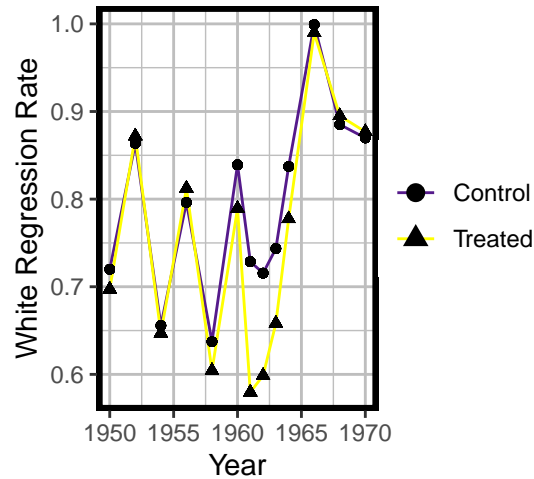
```

    panel.border = element_rect(colour = "black", fill = NA, size = 2)
  )
White =
  laturnout |>
  group_by(year, UnderstandingClause) |>
  mutate(
    across(where(is.labelled), as_factor),
    wrrate = mean(whiteregrate, na.rm = TRUE),
  ) |>
  filter(between(year, 1950, 1970)) |>
  ggplot(aes(x = year,
             y = wrrate,
             group = UnderstandingClause))
  ) +
  geom_line(aes(
    colour = UnderstandingClause
  )) +
  geom_point(aes(
    shape = UnderstandingClause
  )) +
  scale_colour_manual(
    values = c("Control" = "purple4", "Treated" = "yellow1")
  ) +
  labs(
    y = "White Regression Rate",
    x = "Year",
    caption = "(b) White Registration"
  ) +
  guides(
    shape = guide_legend(
      override.aes = list(size = 3)
    )
  ) +
  theme(
    legend.title = element_blank(),
    legend.box.spacing = unit(0, "pt"),
    legend.key = element_blank(),
    panel.background = element_blank(),
    plot.caption = element_text(hjust = 0.5, size = 12, family = "Times New Roman"),
    panel.grid = element_line(colour = "grey"),
    panel.border = element_rect(colour = "black", fill = NA, size = 2)
  )
Black + White

```



(a) Black Registration



(b) White Registration

2. See improvement on previous graph below.

```
lturnout |>
  group_by(year, UnderstandingClause) |>
  mutate(
    brrate = mean(blackregrate, na.rm = TRUE),
    wrrate = mean(whiteregrate, na.rm = TRUE),
    .keep = 'unused'
  ) |>
  pivot_longer(
    cols = ends_with('rate'),
    names_to = 'regrate',
    values_to = 'regratevalues'
  ) |>
  mutate(
    RegRate = FctWhen(
      regrate == 'brrate' ~ '(a) Black Registration Rate',
      regrate == 'wrrate' ~ '(b) White Registration Rate'
    ),
    .keep = 'unused'
  ) |>
  filter(between(year, 1950, 1970)) |>
  ggplot(aes(x = year, y = regratevalues, group = UnderstandingClause)) +
  geom_rect(aes( xmin = 1954, xmax= 1964, ymin= 0, ymax=1), fill = "gray90", alpha = 0.5)+
  facet_wrap(~RegRate) +
  geom_line(aes(
    colour = UnderstandingClause
  )) +
  geom_point(aes(
    shape = UnderstandingClause
  )) +
  scale_colour_manual(
```

```

    values = c("Control" = "aquamarine4", "Treated" = "tan3")
  )+
  guides(
    shape = guide_legend(
      override.aes = list(size = 2)
    )
  )+
  theme(
    legend.box.spacing = unit(0, "pt"),
    axis.line = element_line(colour = "black"),
    panel.grid = element_blank(),
    panel.background = element_blank(),
    legend.title = element_blank(),
    plot.caption = element_text(hjust = 1),
    strip.background = element_blank()
  )+
  labs(
    y = "Regression Rate",
    x = "Year",
    caption = "Shaded space denotes use of understanding clause between 1954 and 1964"
  )

```

