BST270_Final_Proj

2025-01-22

Reproducing "Marriage Isn't Dead — Yet" Figures

The aim is to reproduce figures presented in the article published on FiveThirtyEight: *Marriage Isn't Dead — Yet*. The article is available here: https://fivethirtyeight.com/features/marriage-isnt-dead-yet/. Specifically, we replicate the first, third, and fourth figures in the article.

Data are available via on the FiveThirtyEight GitHub (https://github.com/fivethirtyeight/data/tree/master/marriage), but are also included in the `data` folder of this repo. There are no R packages required to run this code. First we load the data:

```
# read in data
both_sexes_df <- read.csv("./data/both_sexes.csv")
divorce_df <- read.csv("./data/divorce.csv")
women_df <- read.csv("./data/women.csv")
```

Figure 1: Marriage Rates by Education and Race - Ages 25-34

We first use the `both_sexes_df` dataframe.

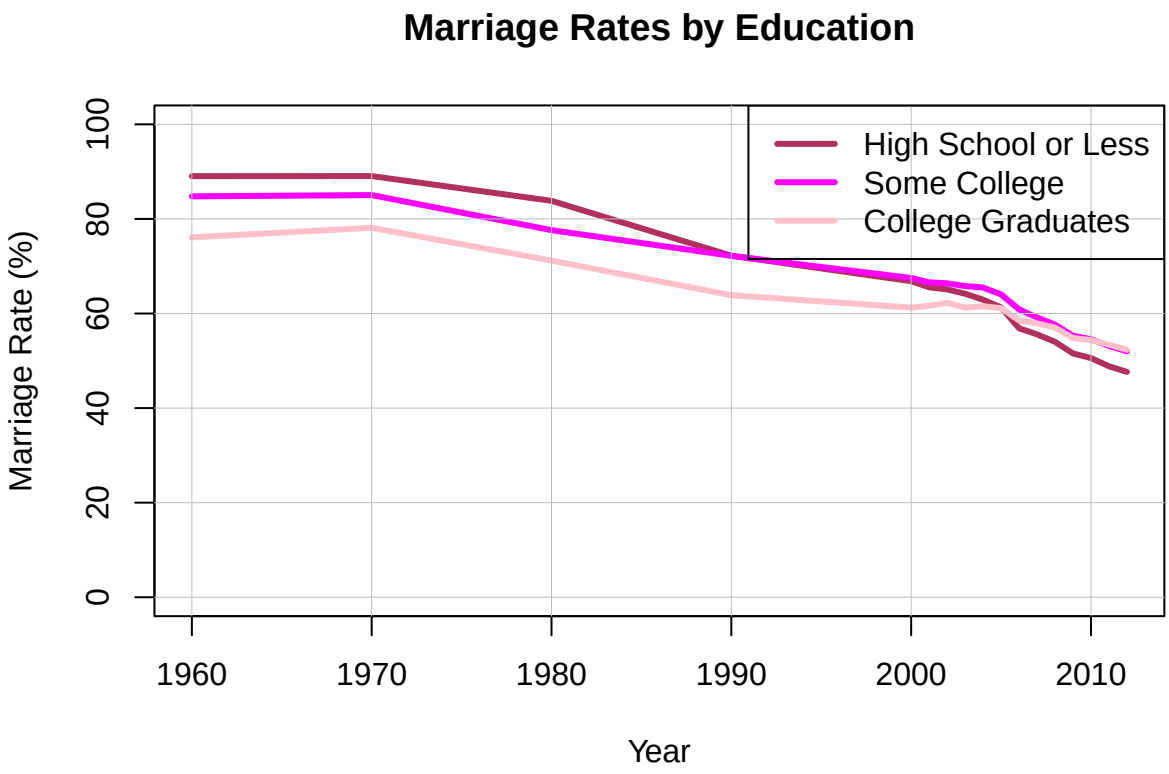
Next we simplify dataframes by removing unneeded columns (ie. columns unrelated to education level and race/ethnicity). We also drop na entries and convert divorce rates to marriage rates.

The columns we use are `HS_2534 - High school graduate or less (EDUCD < 65), age between 25 and 34`, `SC_2534 - Some college (EDUCD >= 65 & <= 100), age between 25 and 34`, and `BAp_2534 - Bachelor's degree or more (EDUCD > 100), age between 25 and 34` for the education plot and `White_2534 - Non-Hispanic white, age between 25 and 34`, `Black_2534 - Black or African-American, age between 25 and 34`, and `Hisp_2534 - Hispanic of any race` for the race/ethnicity plot.

```
# Filter both_sexes.csv

# Education
# remove unneeded columns
both_sexes_edu_filt_df <- both_sexes_df[, c("year", "HS_2534",
                                            "SC_2534", "BAp_2534")]
# remove na's from HS_2534, SC_2534, BAp_2534 columns
both_sexes_edu_filt_df <- both_sexes_edu_filt_df[!is.na(both_sexes_edu_filt_df$HS_2534) |
                                                   !is.na(both_sexes_edu_filt_df$SC_2534) |
                                                   !is.na(both_sexes_edu_filt_df$SC_2534),]
# convert to marriage rates
both_sexes_edu_filt_df$HS_2534 <- 1- both_sexes_edu_filt_df$HS_2534
both_sexes_edu_filt_df$SC_2534 <- 1- both_sexes_edu_filt_df$SC_2534
both_sexes_edu_filt_df$BAp_2534 <- 1- both_sexes_edu_filt_df$BAp_2534
```

```r
# Race & Ethnicity
# remove unneeded columns
both_sexes_race_eth_filt_df <- both_sexes_df[, c("year", "White_2534",
                                                 "Black_2534", "Hisp_2534")]
# remove na's from White_2534, Black_2534, Hisp_2534 columns
both_sexes_race_eth_filt_df <- both_sexes_race_eth_filt_df[
                                  !is.na(both_sexes_race_eth_filt_df$White_2534) |
                                  !is.na(both_sexes_race_eth_filt_df$Black_2534) |
                                  !is.na(both_sexes_race_eth_filt_df$Hisp_2534),]
# convert to marriage rates
both_sexes_race_eth_filt_df$White_2534 <- 1- both_sexes_race_eth_filt_df$White_2534
both_sexes_race_eth_filt_df$Black_2534 <- 1- both_sexes_race_eth_filt_df$Black_2534
both_sexes_race_eth_filt_df$Hisp_2534 <- 1- both_sexes_race_eth_filt_df$Hisp_2534
```

```r
# Plot Marriage Rates by Education Level
matplot(both_sexes_edu_filt_df$year, cbind(both_sexes_edu_filt_df$HS_2534*100,
                                           both_sexes_edu_filt_df$SC_2534*100,
                                           both_sexes_edu_filt_df$BAp_2534*100),
        type = "l", lty = 1,lwd=3,
        col = c("maroon", "magenta", "pink"), xlab = "Year",
        ylab = "Marriage Rate (%)", main = "Marriage Rates by Education",
        ylim = c(0,100))
grid(nx = NULL, ny = NULL,
     lty = 1,
     col = "gray",
     lwd = 0.5)
legend("topright", legend = c("High School or Less", "Some College",
                              "College Graduates"),
       col = c("maroon", "magenta", "pink"),
       lty = 1, lwd=3)
```




```
# Plot Marriage Rates by Race/Ethnicity
matplot(both_sexes_race_eth_filt_df$year,
        cbind(both_sexes_race_eth_filt_df$White_2534*100,
              both_sexes_race_eth_filt_df$Black_2534*100,
              both_sexes_race_eth_filt_df$Hisp_2534*100),
        type = "l", lty = 1,lwd=3,
        col = c("forestgreen", "darkgreen", "lightgreen"), xlab = "Year",
        ylab = "Marriage Rate (%)", main = "Marriage Rates by Race",
        ylim = c(0,100))
grid(nx = NULL, ny = NULL,
     lty = 1,
     col = "gray",
     lwd = 0.5)
legend("topright", legend = c("Non-hispanic White", "Black", "Hispanic"),
       col = c("forestgreen", "darkgreen", "lightgreen"),
       lty = 1, lwd=3)
```

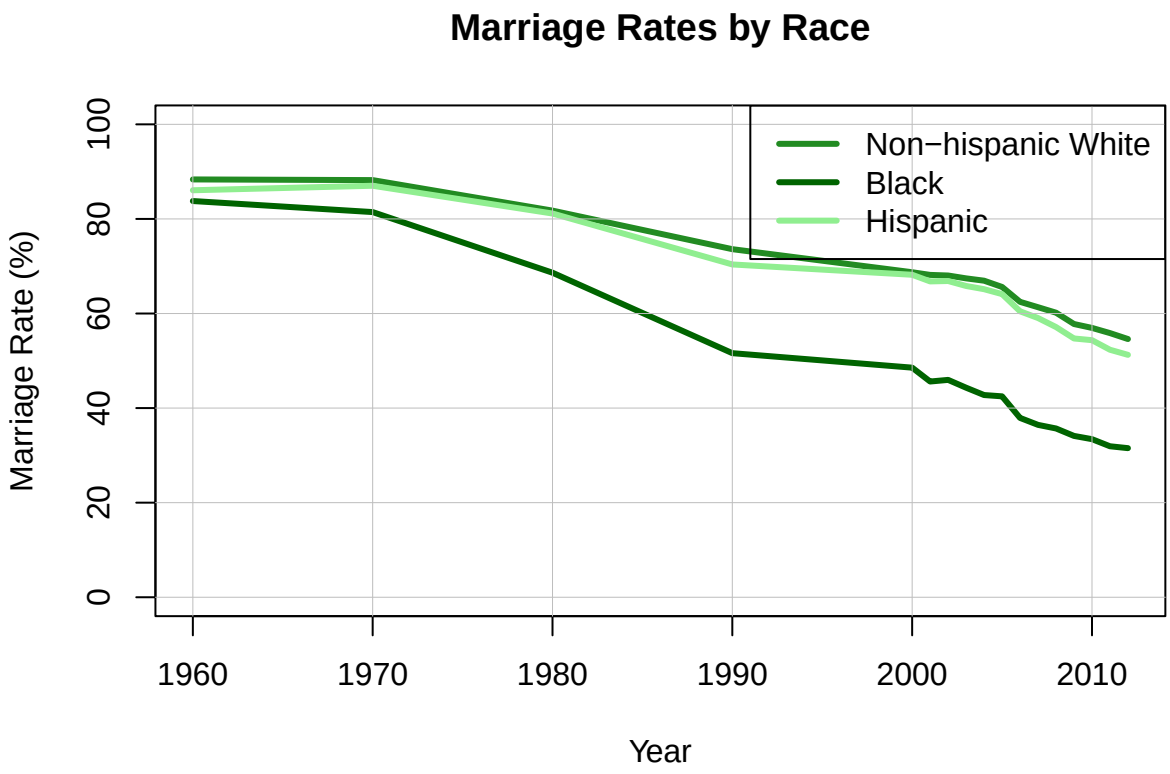


Figure 3: Marriage Rates for Women by Education - Ages 25-34

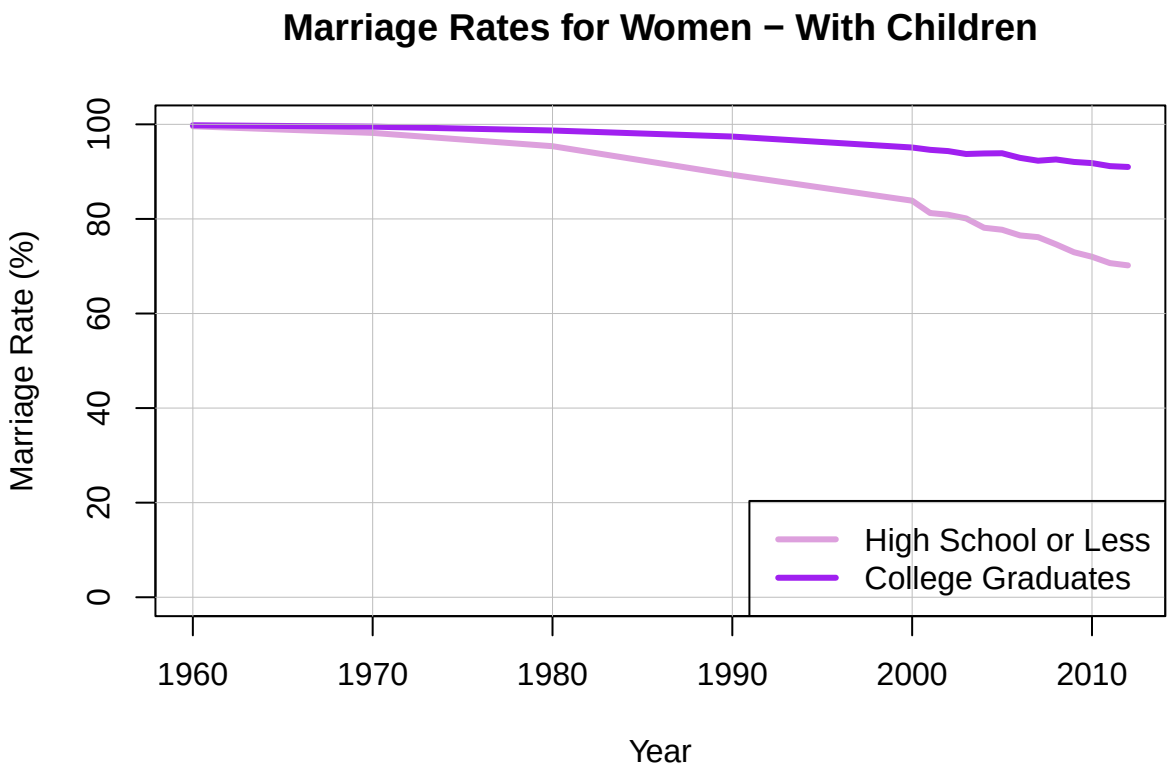
We use the `women_df` dataframe here.

The columns we use for women with children's education levels are `kids_HS_2534 - High school graduate or less (EDUCD < 65), age between 25 and 34`, `kids_SC_2534 - Some college (EDUCD >= 65 & <= 100), age between 25 and 34`, and `kids_BAp_2534 - Bachelor's degree or more (EDUCD > 100), age between 25 and 34` and the columns we use for women without children's education levels are `nokids_HS_2534 - High school graduate or less (EDUCD < 65), age between 25 and 34`, `nokids_SC_2534 - Some college (EDUCD >= 65 & <= 100), age between 25 and 34`, and `nokids_BAp_2534 - Bachelor's degree or more (EDUCD > 100), age between 25 and 34`.

```
# Filter women.csv

# Women with Children
# remove unneeded columns
women_df_with_children <- women_df[, c("year", "kids_HS_2534", "kids_BAp_2534")]

# remove na's from kids_HS_2534 and kids_BAp_2534 columns
women_df_with_children <- women_df_with_children[
                                    !is.na(women_df_with_children$kids_HS_2534) |
                                    !is.na(women_df_with_children$kids_BAp_2534),]
# convert to marriage rates
women_df_with_children$kids_HS_2534 <- 1- women_df_with_children$kids_HS_2534
women_df_with_children$kids_BAp_2534 <- 1 - women_df_with_children$kids_BAp_2534
```

```r
# Women without Children
# remove unneeded columns
women_df_without_children <- women_df[, c("year", "nokids_HS_2534",
                                          "nokids_BAp_2534")]

# remove na's from nokids_HS_2534 and nokids_BAp_2534 columns
women_df_without_children <- women_df_without_children[
                              !is.na(women_df_without_children$nokids_HS_2534) |
                              !is.na(women_df_without_children$nokids_BAp_2534),]
# convert to marriage rates
women_df_without_children$nokids_HS_2534 <- 1- women_df_without_children$nokids_HS_2534
women_df_without_children$nokids_BAp_2534 <- 1 - women_df_without_children$nokids_BAp_2534
```

```r
# Plot marriage rates for women with children
matplot(women_df_with_children$year, cbind(women_df_with_children$kids_HS_2534*100,
                                           women_df_with_children$kids_BAp_2534*100),
        type = "l", lty = 1,lwd=3,
        col = c("plum", "purple"), xlab = "Year",
        ylab = "Marriage Rate (%)", main = "Marriage Rates for Women - With Children",
        ylim = c(0,100))
grid(nx = NULL, ny = NULL,
     lty = 1,
     col = "gray",
     lwd = 0.5)
legend("bottomright", legend = c("High School or Less",
                                 "College Graduates"),
       col = c("plum", "purple"),
       lty = 1, lwd=3)
```




```
# Plot marriage rates for women without children
matplot(women_df_without_children$year, cbind(women_df_without_children$nokids_HS_2534*100,
                                              women_df_without_children$nokids_BAp_2534*100),
        type = "l", lty = 1,lwd=3,
        col = c("plum", "purple"), xlab = "Year",
        ylab = "Marriage Rate (%)", main = "Marriage Rates for Women - Without Children",
        ylim = c(0,100))
grid(nx = NULL, ny = NULL,
     lty = 1,
     col = "gray",
     lwd = 0.5)
legend("bottomright", legend = c("High School or Less",
                                 "College Graduates"),
       col = c("plum", "purple"),
       lty = 1, lwd=3)
```

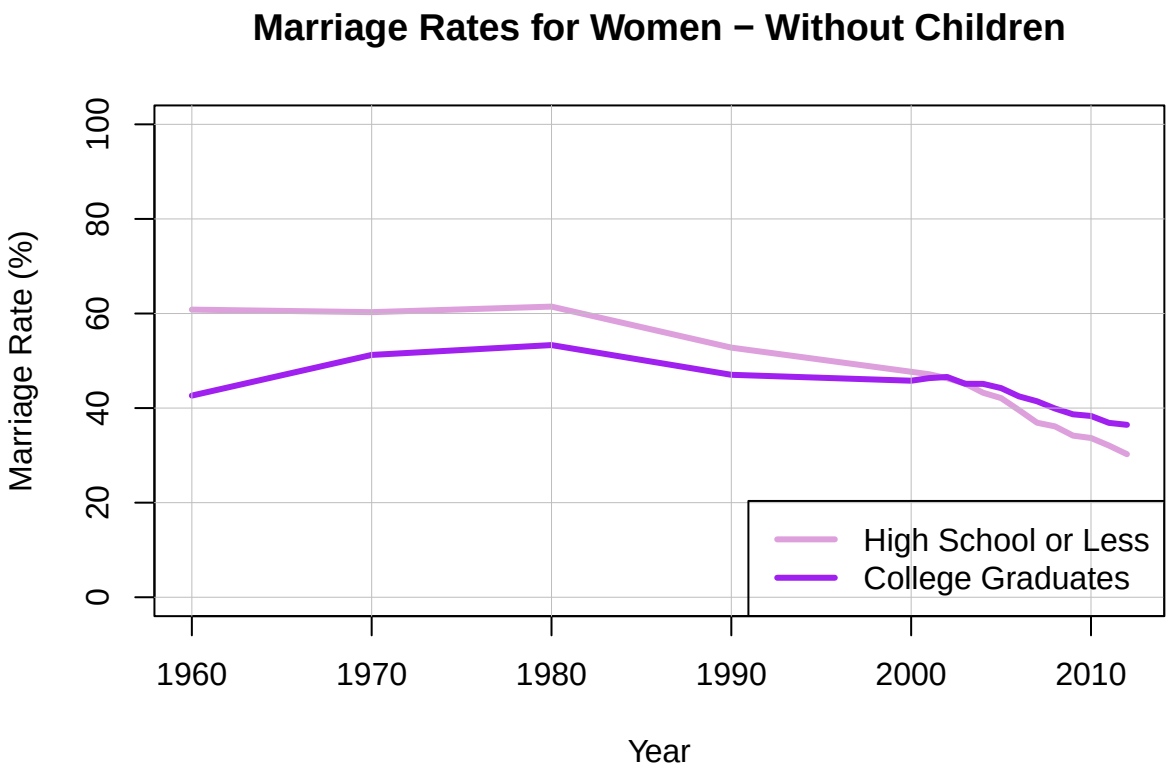


Figure 4:

Divorce Rates by Education - Ages 35-44

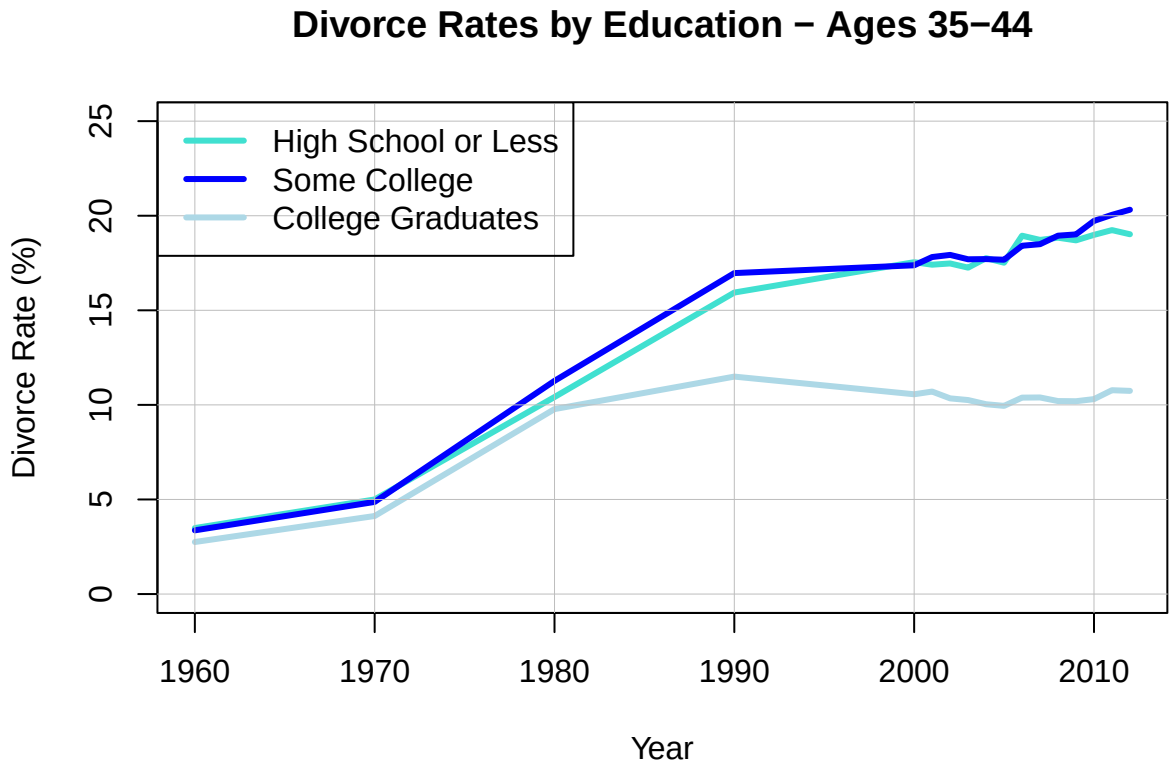
We use the `divorce_df` dataframe here.

The columns we use for women with children's education levels are `HS_3544 - High school graduate or less (EDUCD < 65), age between 35 and 44, SC_3544 - Some college (EDUCD >= 65 & <= 100), age between 35 and 44`, and `BAp_3544 - Bachelor's degree or more (EDUCD > 100), age between 35 and 44`.

```
# Divorce rates
# remove unneeded columns
divorce_edu_df <- divorce_df[,c("year", "HS_3544", "SC_3544", "BAp_3544")]

# remove na's from HS_3544, SC_3544, BAp_3544 columns
divorce_edu_df <- divorce_edu_df[
                            !is.na(divorce_edu_df$HS_3544) |
                            !is.na(divorce_edu_df$SC_3544) |
                            !is.na(divorce_edu_df$BAp_3544) ,]
```

```
# Divorce Plot
matplot(divorce_edu_df$year, cbind(divorce_edu_df$HS_3544*100,
                                   divorce_edu_df$SC_3544*100,
                                   divorce_edu_df$BAp_3544*100),
```

```
        type = "l", lty = 1,lwd=3,
        col = c("turquoise", "blue", "lightblue"), xlab = "Year",
        ylab = "Divorce Rate (%)", main = "Divorce Rates by Education - Ages 35-44",
        ylim = c(0,25))
grid(nx = NULL, ny = NULL,
     lty = 1,
     col = "gray",
     lwd = 0.5)
legend("topleft", legend = c("High School or Less",
                             "Some College",
                             "College Graduates"),
       col = c("turquoise", "blue", "lightblue"),
       lty = 1, lwd=3)
```



Comments on Reproducibility

To my eye, these figures match (or very closely match) those published in the original article. These figures were simple to reproduce and the GitHub repo provided by FiveThirtyEight clearly describes all column names. Cleaning procedures were not described, but the data does not appear to need much cleaning (other than dropping na's). All in all, very little data processing was required.