

Potential Factors of Decreasing Birth Rates in the US since the Great Recession and Beyond*

Reproduction of 'The Puzzle of Falling US Birth Rates since the Great Recession'(Kearney, Levine & Pardue, 2022)

Chay Park

February 8, 2024

First sentence. Second sentence. Third sentence. Fourth sentence.

1 Introduction

2 Data

2.1 Source

```
# Load necessary libraries
library(ggplot2)
library(gridExtra)
```

Attaching package: 'gridExtra'

The following object is masked from 'package:dplyr':

combine

*Code and data are available at: <https://github.com/Chay-HyunminPark/Social-Science-Study>.

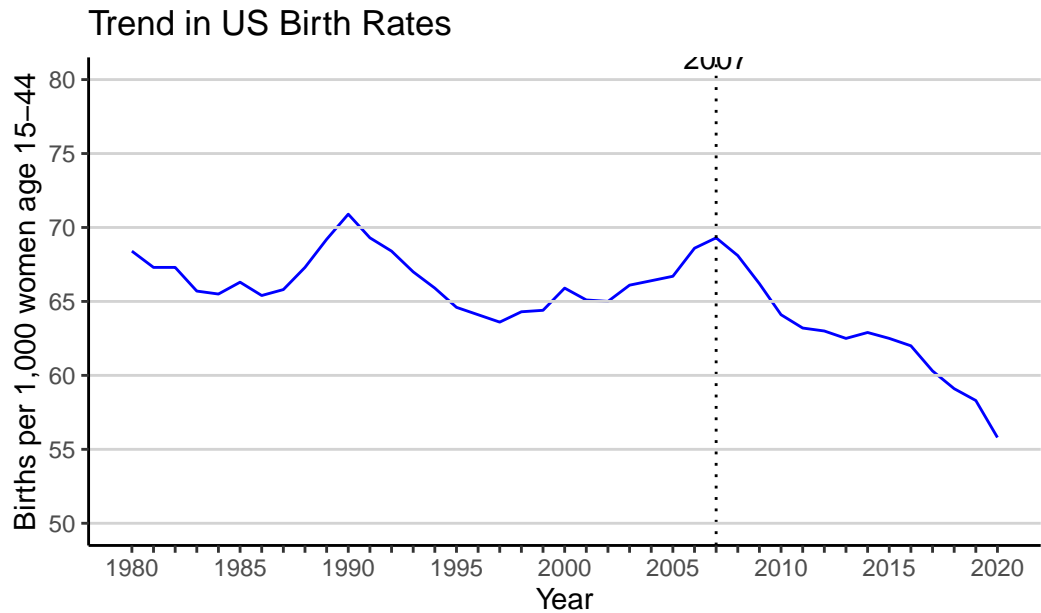


Figure 1: Trend in US Birth Rates

```
# Set seed for reproducibility
set.seed(123)

# Read the data from CSV file
data <- read.csv(file = here::here("outputs/data/figs_2a_2b.csv"))

# Plotting the first line graph (Graph A)
graph_A <- ggplot(data, aes(x = year)) +
  geom_line(aes(y = brate_1519, color = "Age 15-19"), size = 1.2) +
  geom_line(aes(y = brate_2024, color = "Age 20-24"), size = 1.2) +
  geom_line(aes(y = brate_2529, color = "Age 25-29"), size = 1.2) +
  geom_line(aes(y = brate_3034, color = "Age 30-34"), size = 1.2) +
  geom_line(aes(y = brate_3539, color = "Age 35-39"), size = 1.2) +
  geom_line(aes(y = brate_4044, color = "Age 40-44"), size = 1.2) +
  scale_color_manual(values = c("Age 15-19" = "blue", "Age 20-24" = "orange", "Age 25-29" = "yellow",
                                "Age 30-34" = "yellow", "Age 35-39" = "cyan", "Age 40-44" = "cyan"),
                    labels = c("Age 15-19", "Age 20-24", "Age 25-29", "Age 30-34", "Age 35-39", "Age 40-44"),
                    name = "Age Group") +
  geom_vline(xintercept = 2007, linetype = "dotted") +
  geom_hline(yintercept = seq(0, 140, by = 20), color = "lightgrey") +
```

```

scale_x_continuous(limits = c(1980, 2020), breaks = seq(1980, 2020, by = 5)) +
scale_y_continuous(limits = c(0, 140), breaks = seq(0, 140, by = 20)) +
labs(x = "Year", y = "Births per 1,000 women in relevant population subgroup",
     title = "Trend in US Birth Rates by Age Group",
     caption = "Birth Rates collected from CDC Vital Statistics Births Reports for 2015",
     theme_classic()

```

Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
i Please use `linewidth` instead.

```

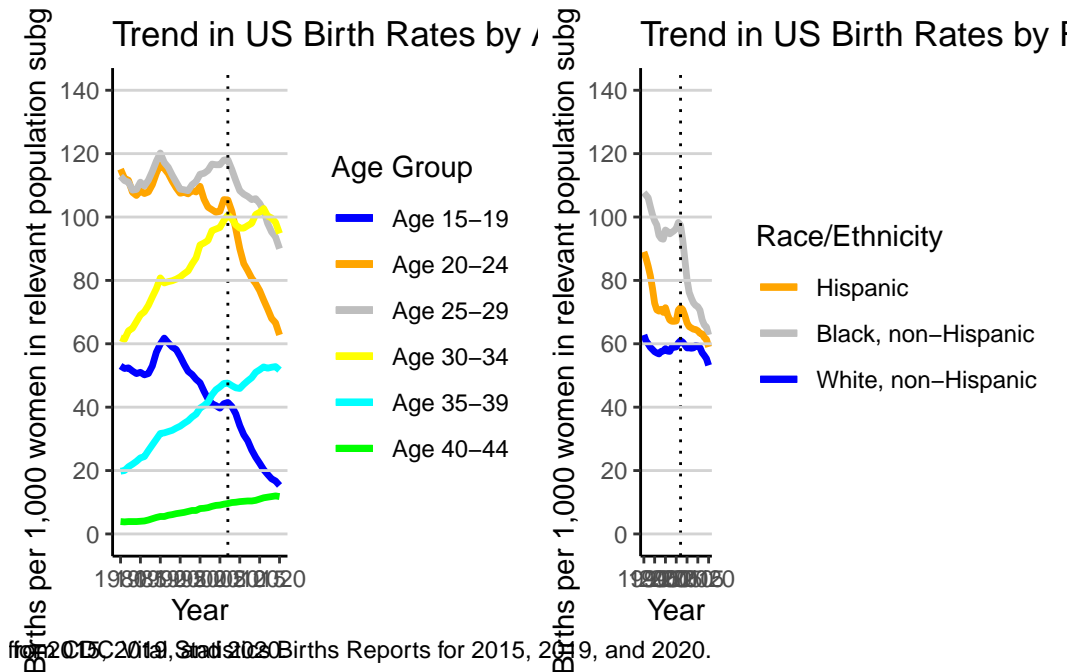
# Plotting the second line graph (Graph B)
graph_B <- ggplot(data, aes(x = year)) +
  geom_line(aes(y = brate_hisp, color = "Hispanic"), size = 1.2) +
  geom_line(aes(y = brate_blacknh, color = "Black, non-Hispanic"), size = 1.2) +
  geom_line(aes(y = brate_whitenh, color = "White, non-Hispanic"), size = 1.2) +
  scale_color_manual(values = c("Hispanic" = "grey", "Black, non-Hispanic" = "orange", "White, non-Hispanic" = "lightgrey"),
                    labels = c("Hispanic", "Black, non-Hispanic", "White, non-Hispanic"),
                    name = "Race/Ethnicity") +
  geom_vline(xintercept = 2007, linetype = "dotted") +
  geom_hline(yintercept = seq(0, 140, by = 20), color = "lightgrey") +
  scale_x_continuous(limits = c(1990, 2020), breaks = seq(1990, 2020, by = 5)) +
  scale_y_continuous(limits = c(0, 140), breaks = seq(0, 140, by = 20)) +
  labs(x = "Year", y = "Births per 1,000 women in relevant population subgroup",
       title = "Trend in US Birth Rates by Race/Ethnicity",
       caption = "Birth Rates collected from CDC Vital Statistics Births Reports for 2015",
       theme_classic()

# Arrange both graphs side by side
grid.arrange(graph_A, graph_B, nrow = 1)

```

Warning: Removed 10 rows containing missing values (`geom_line()`).

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  geom_line(aes(y = brate_2024, color = "Age 20-24"), size = 1.2) +
  geom_line(aes(y = brate_2529, color = "Age 25-29"), size = 1.2) +
  geom_line(aes(y = brate_3034, color = "Age 30-34"), size = 1.2) +
  geom_line(aes(y = brate_3539, color = "Age 35-39"), size = 1.2) +
  geom_line(aes(y = brate_4044, color = "Age 40-44"), size = 1.2) +
  geom_text(aes(label = "Age 15-19", x = 2020, y = brate_1519), hjust = 0, vjust = -0.5, color = "green", size = 1.2) +
  geom_text(aes(label = "Age 20-24", x = 2020, y = brate_2024), hjust = 0, vjust = -0.5, color = "orange", size = 1.2) +
  geom_text(aes(label = "Age 25-29", x = 2020, y = brate_2529), hjust = 0, vjust = -0.5, color = "grey", size = 1.2) +
  geom_text(aes(label = "Age 30-34", x = 2020, y = brate_3034), hjust = 0, vjust = -0.5, color = "yellow", size = 1.2) +
  geom_text(aes(label = "Age 35-39", x = 2020, y = brate_3539), hjust = 0, vjust = -0.5, color = "cyan", size = 1.2) +
  geom_text(aes(label = "Age 40-44", x = 2020, y = brate_4044), hjust = 0, vjust = -0.5, color = "green", size = 1.2)
```

```

geom_text(aes(label = "Age 35-39", x = 2020, y = brate_3539), hjust = 0, vjust = -0.5, color = "black") +
geom_text(aes(label = "Age 40-44", x = 2020, y = brate_4044), hjust = 0, vjust = -0.5, color = "black") +
geom_vline(xintercept = 2007, linetype = "dotted") +
geom_hline(yintercept = seq(0, 140, by = 20), color = "lightgrey") +
scale_x_continuous(limits = c(1980, 2020), breaks = seq(1980, 2020, by = 5), labels = FALSE) +
scale_y_continuous(limits = c(0, 140), breaks = seq(0, 140, by = 20)) +
labs(y = "Births per 1,000 women in relevant population subgroup",
     title = "A: Five-year age group",
     caption = "Note: Birth rates by age group, race and ethnicity, and marital status are shown for the
     United States, 1980-2020") +
theme_classic() +
theme(axis.text.x = element_text(angle = 45, hjust = 1, family = "Times"))

# Plotting the second line graph (Graph B)
graph_B <- ggplot(data, aes(x = year)) +
  geom_line(aes(y = brate_hisp, color = "Hispanic"), size = 1.2) +
  geom_line(aes(y = brate_blacknh, color = "Black, non-Hispanic"), size = 1.2) +
  geom_line(aes(y = brate_whitenh, color = "White, non-Hispanic"), size = 1.2) +
  geom_text(aes(label = "Hispanic", x = 2020, y = brate_hisp), hjust = 0, vjust = -0.5, color = "black") +
  geom_text(aes(label = "Black, non-Hispanic", x = 2020, y = brate_blacknh), hjust = 0, vjust = -0.5, color = "black") +
  geom_text(aes(label = "White, non-Hispanic", x = 2020, y = brate_whitenh), hjust = 0, vjust = -0.5, color = "black") +
  geom_vline(xintercept = 2007, linetype = "dotted") +
  geom_hline(yintercept = seq(0, 140, by = 20), color = "lightgrey") +
  scale_x_continuous(limits = c(1990, 2020), breaks = seq(1990, 2020, by = 5), labels = FALSE) +
  scale_y_continuous(limits = c(0, 140), breaks = seq(0, 140, by = 20)) +
  labs(title = "B: Race and ethnicity (ages 15-44)") +
  theme_classic()

# Arrange both graphs side by side
grid.arrange(graph_A, graph_B, nrow = 1)

```

Warning: Removed 10 rows containing missing values (`geom_line()`).

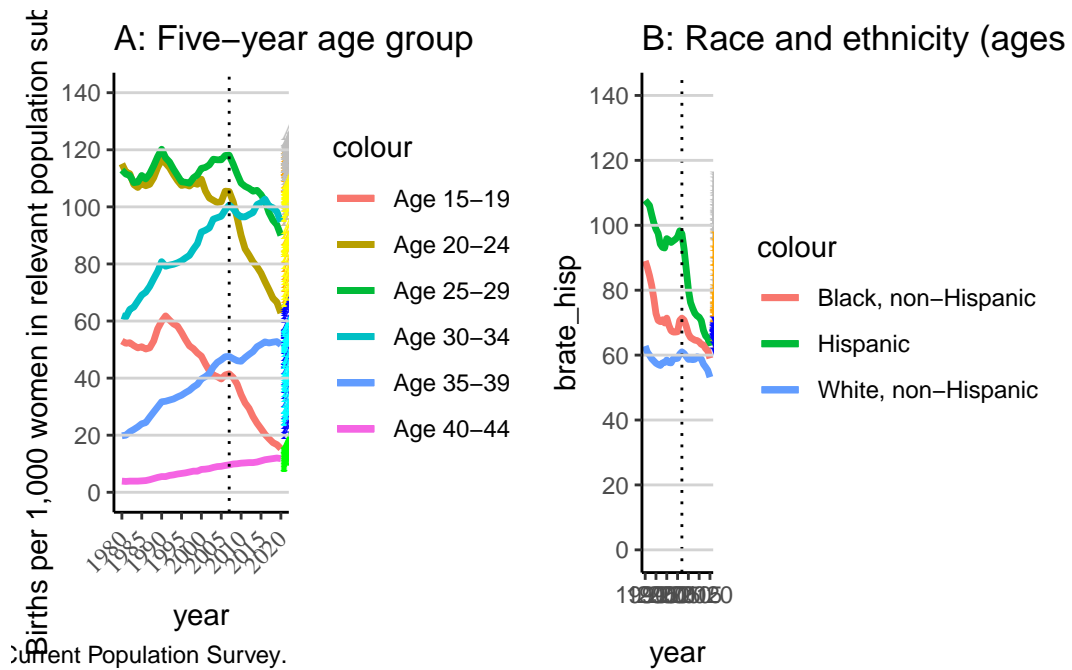
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Warning: Removed 9 rows containing missing values (`geom_text()`).

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2.2 Methodology

2.3 Features

2.3.1 Data Cleaning

2.3.2 Data Modification

2.3.3 Data Visualization

3 Results

The results section should convey findings. ## Table, graph, table, graph

4 Discussion

In the discussion section, and any other relevant section, please be sure to discuss ethics and bias, with reference to relevant literature.

4.1 Findings

If my paper were 10 pages, then should be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

4.2 Ethical Implication

4.3 Accounting for bias

4.4 Limitation

4.5 Future Research

5 References