Variation in Police Shootings in the U.S.

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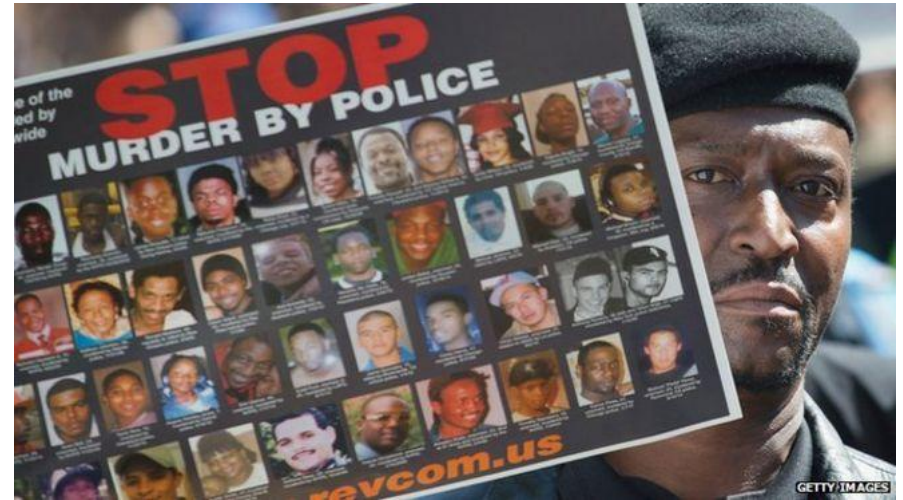Zoey Mengzhu Sun '22

Computer Science

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The Data

- Find insights into controversy.
- Cleaning, hypothesis tests, and visualization.
- Analyze how shootings vary across certain parameters.

Datasets
➢ *FatalEncounters.org Dataset*
➢ *Washington Post Fatal Police Shootings, 2015-Present Dataset*

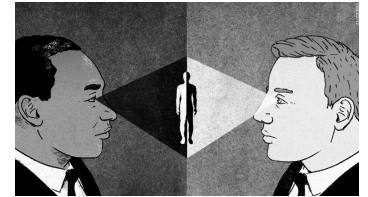# Questions for Our Data

Main Parameters

1 **Time-based: Political movements/media coverage**
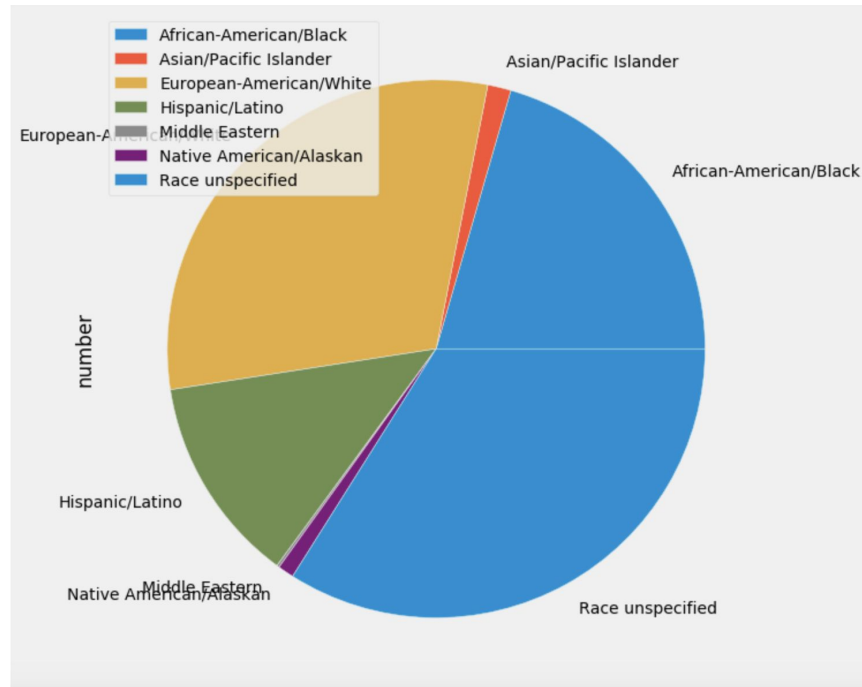

2 **Racial distributions in cities**

3 **Crime rates**

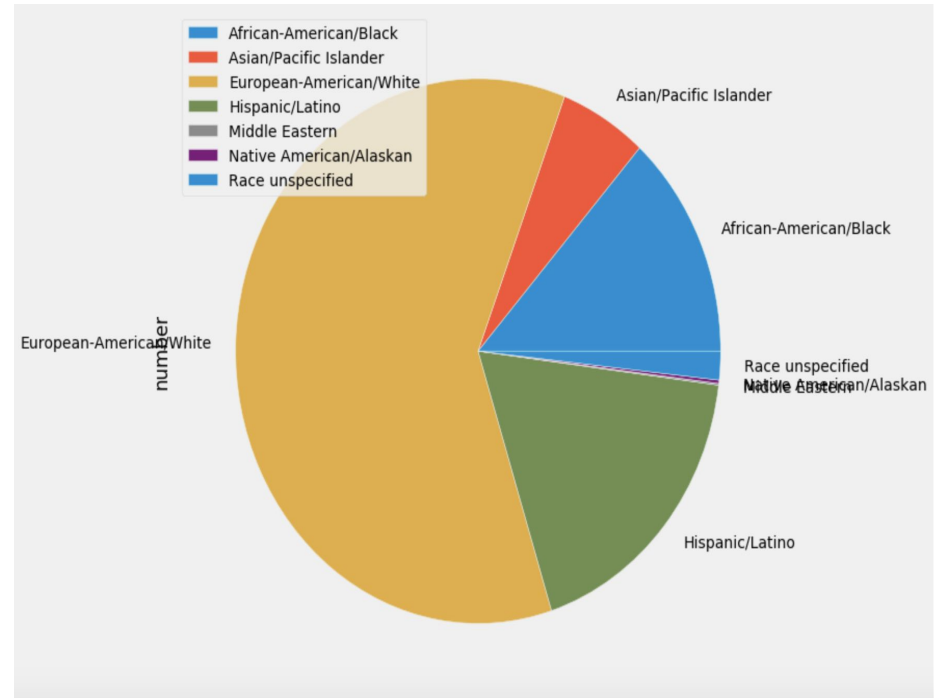# Racial Police Killings: Random?

Given the total racial distribution (as shown below), are the police shootings (also below) we saw in our dataset randomly distributed?

Racial Distribution of Police Shootings

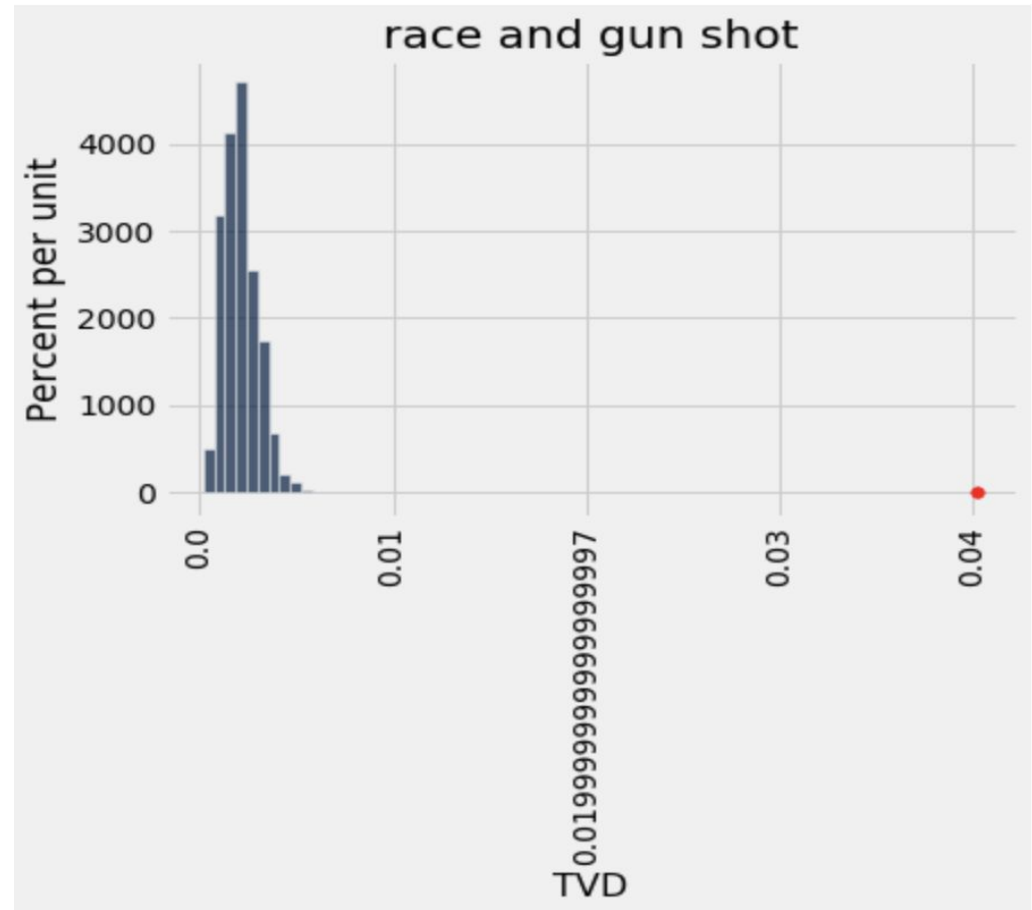
Racial Distribution Across the US

Racial Police Killings: Random?

THE RESULTS

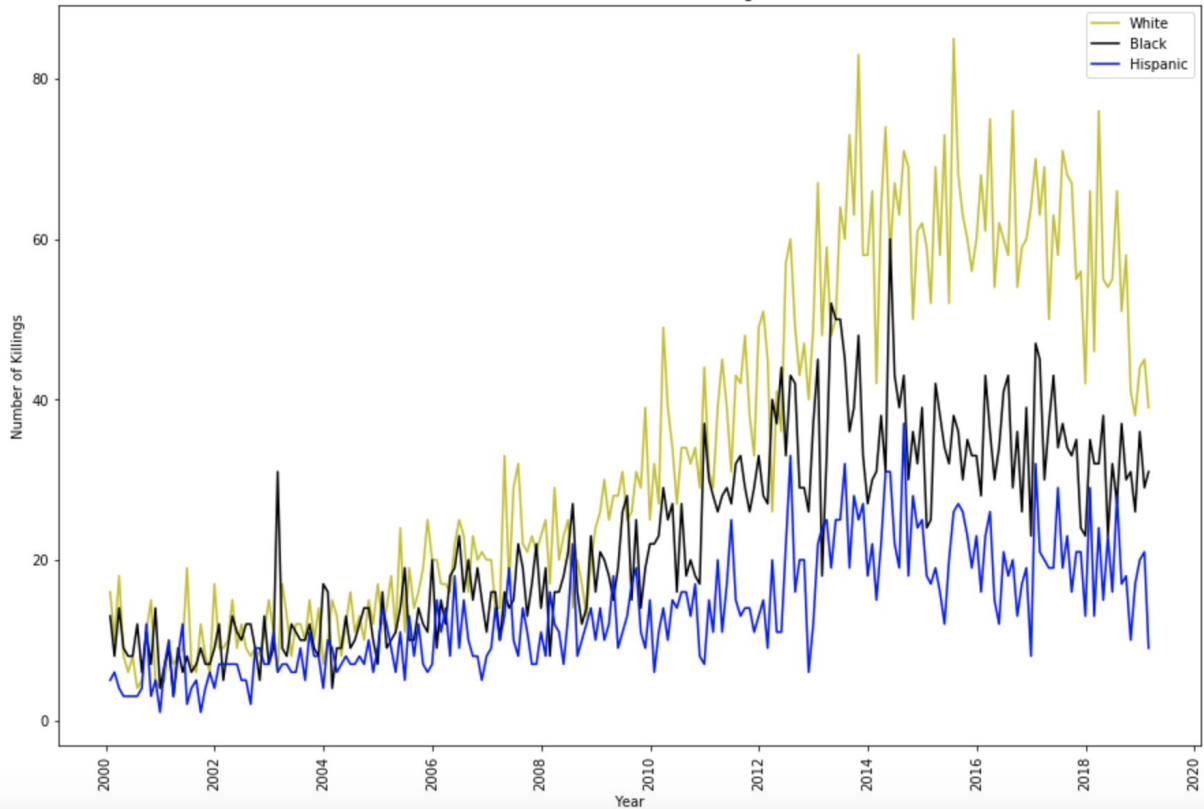Under a null hypothesis that the total variation distance between each category occurs randomly and deviates only by random chance, we found a p-value of 0.

SO, this was clearly likely to be not random. What could it be, then?

race and gun shot

Police Killings Over Time

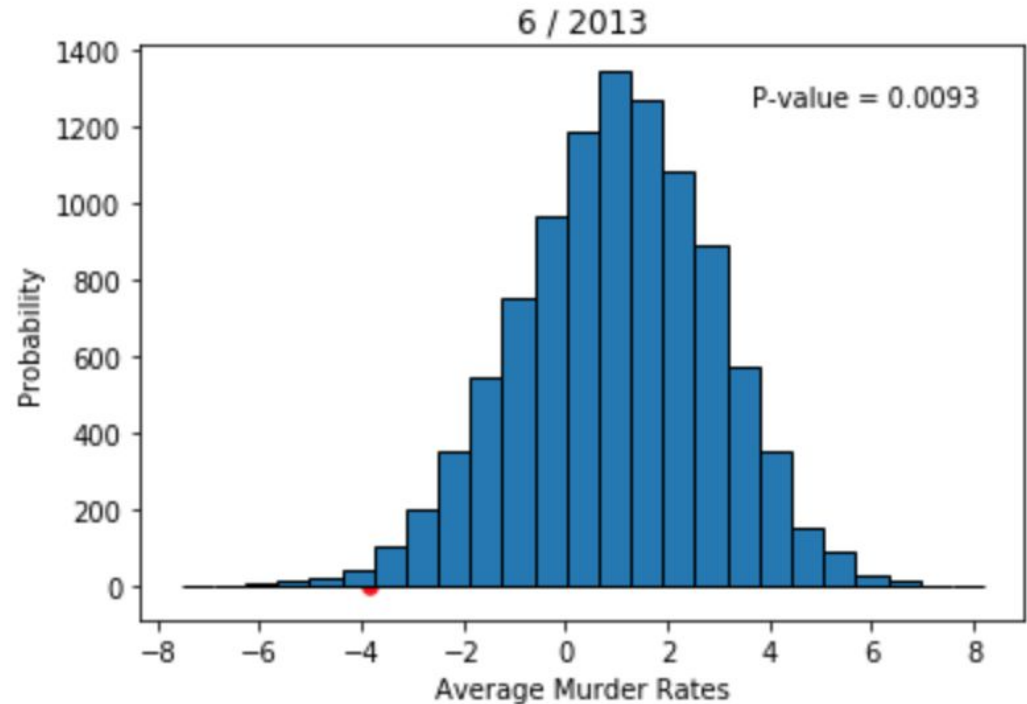Racial Variation of Police Killings

APPROACH

Build a hypothesis test

Find a proper test statistic

Domain of time analysis

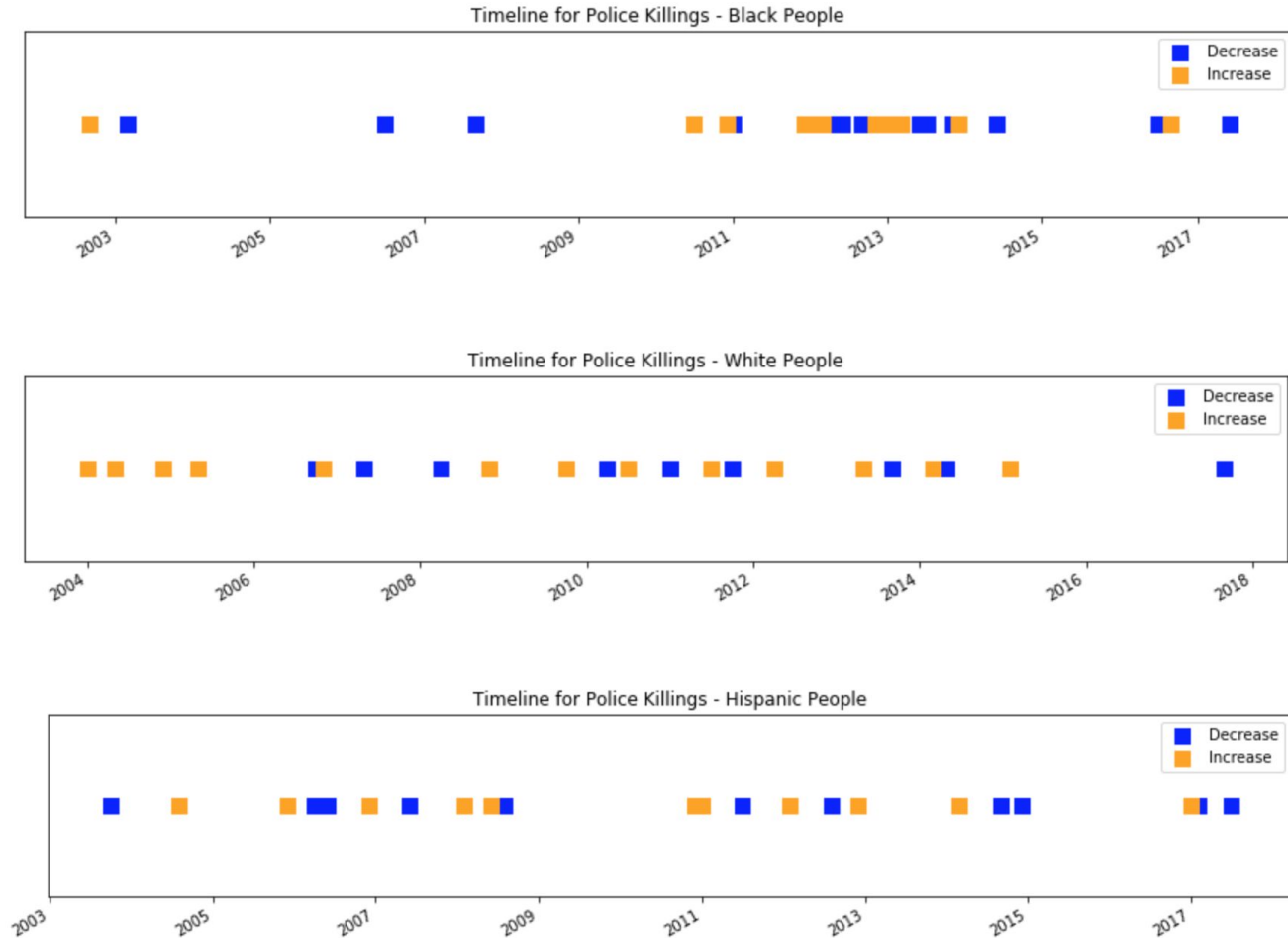# Hypothesis Testing

- <u>Null</u>: Any significant deviation from past trends in murder rates is due to random chance.
- <u>Alternative</u>: It's not due to random chance.
- E.g. Founding of Black Lives Matter in 2013

6 / 2013

P-value = 0.0093
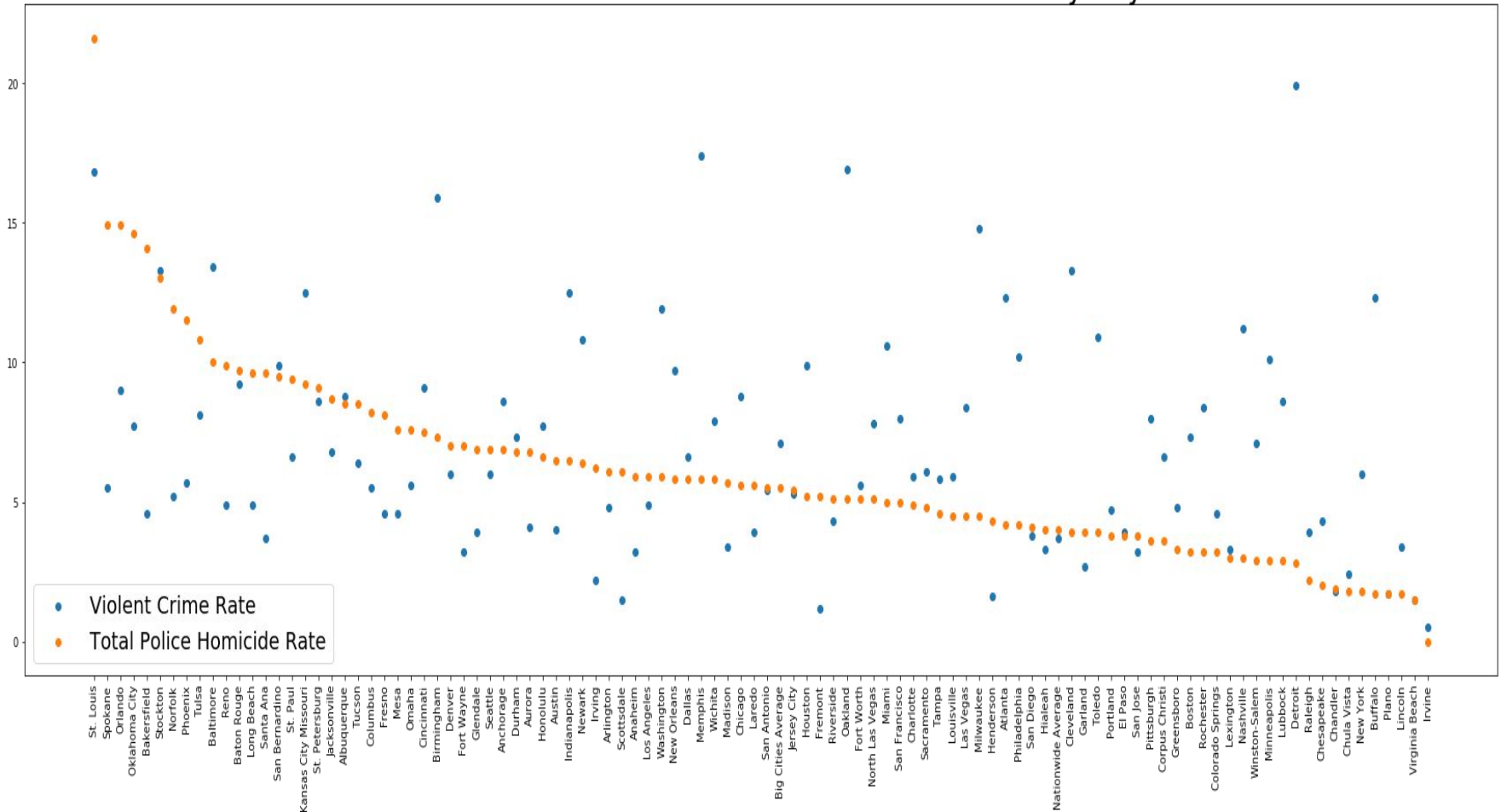
Results

Notable Events

- **2006** - *Sean Bell "Shopping for Justice"*
- **2009** - *Oakland BART shooting of Oscar Grant*
- **2011** - *Kelly Thomas video*
- **2013** - *Founding of BLM*
- **2014** - *Shootings of Brown, Garner, body cams*
- **2018** - *Clark shooting in yard*

Timeline for Police Killings - Black People

Timeline for Police Killings - White People

Timeline for Police Killings - Hispanic People
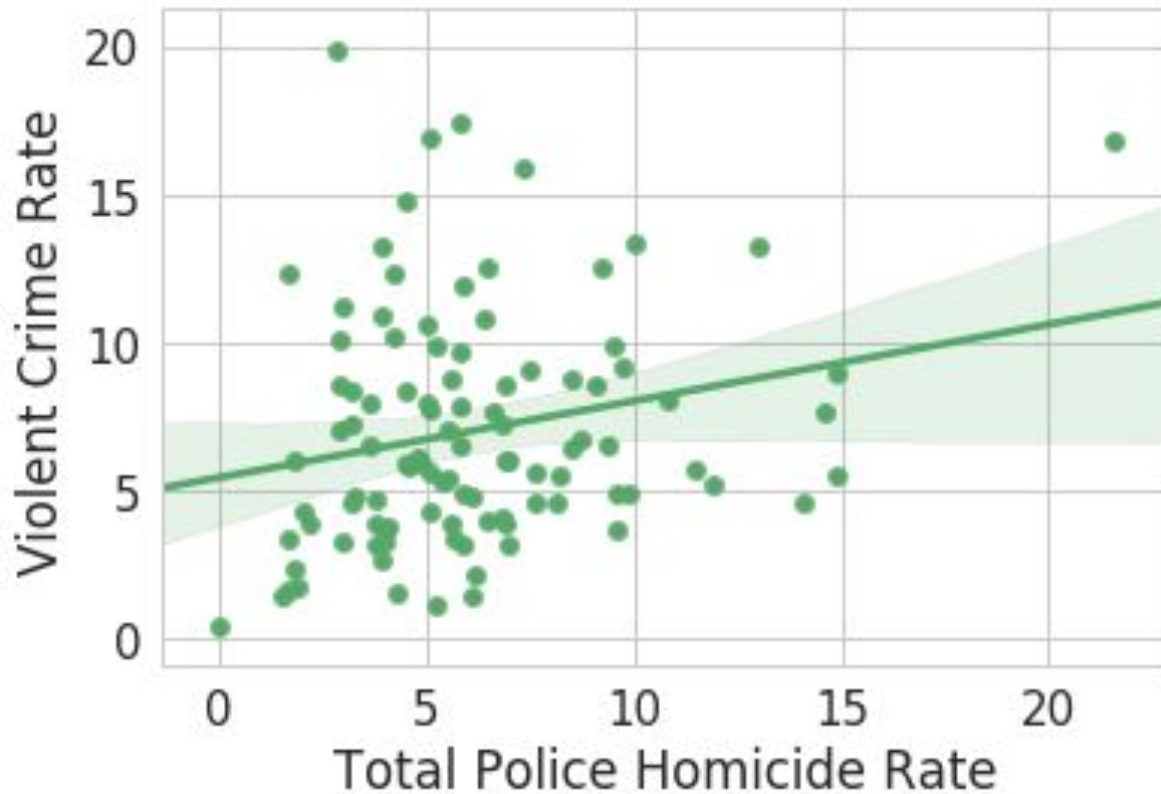
Crime Rates and Police Killings: Related?

Is there some sort of a correlation between the crime rates in a given city and the rate of police killings therein?

Violent Crime Rates Versus Police Homicide Rates by City

Crime Rates and Police Killings: Related?

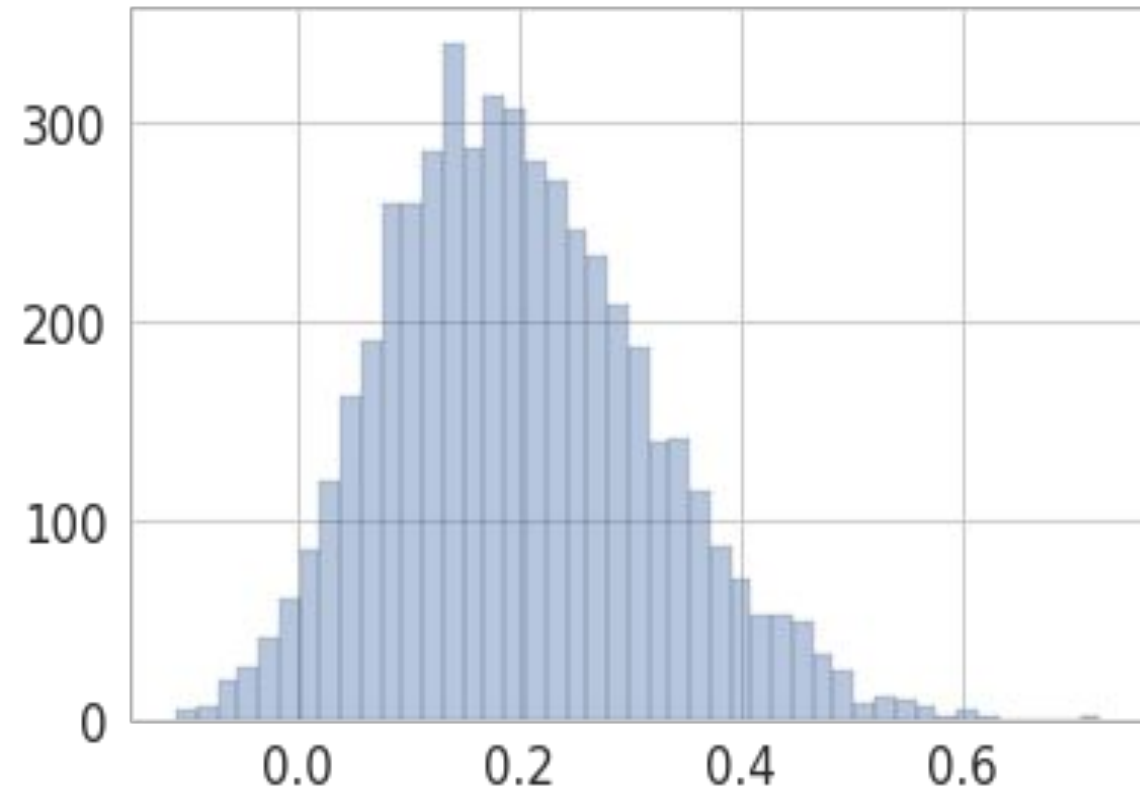Correlation between Violent Crime Rate and Total Police Homicide

THE RESULTS

Overall, there is a weak correlation between the total police homicide rate and the violent crime rate in cities.

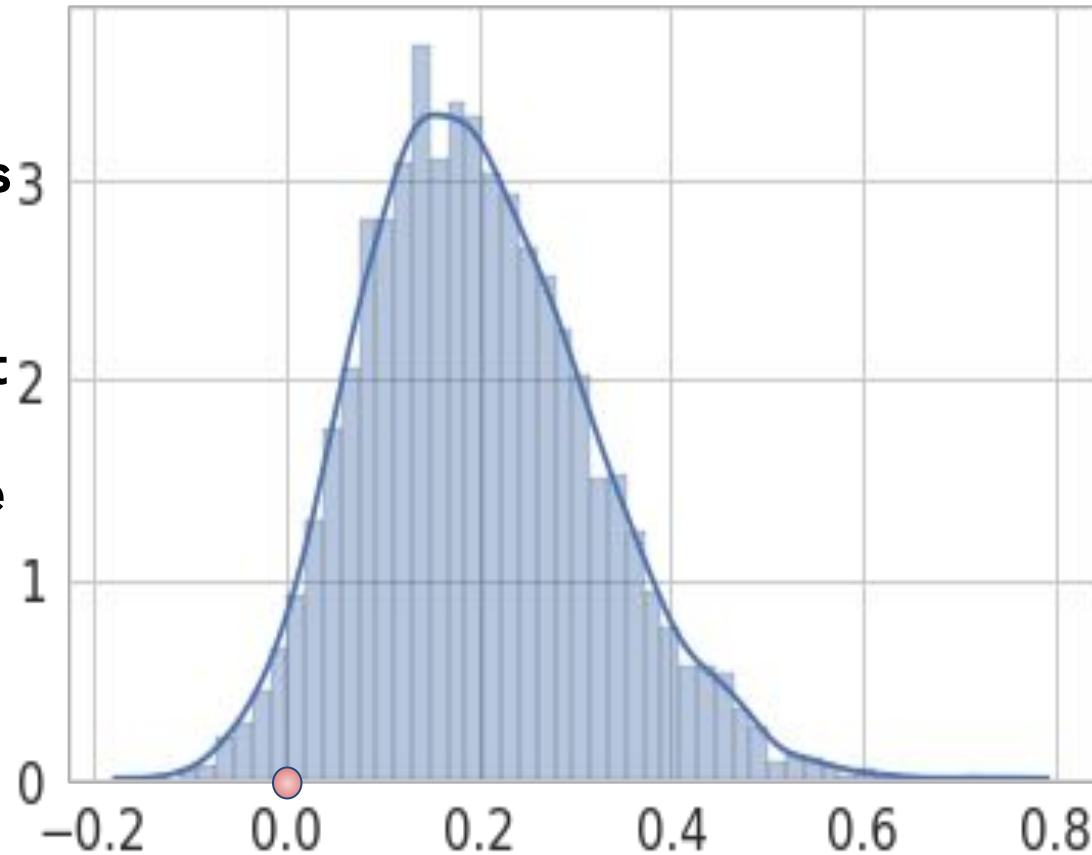Specifically, with an *r*-value of 0.225.

Hypothesis Testing

Histogram of the slopes when sampled with replacement

- <u>Null</u>: There linear correlation between Violent Crime Rates and Police Homicide Rate: slope of regression line = 0.
- <u>Alternative</u>: There is a correlation between the two rates and slope is not 0.

Results

- Value 0 of the slope is included in the random distribution as shown by the red dot on the horizontal axis of the histogram.

- This observation is consistent with the null hypothesis, therefore we fail to reject the null.

- In conclusion, police killings are not consistent with violent crimes

<u>The level of crime in the US does not make it more or less likely to kill people.</u>

Cal

Questions?