**Sarah Wigodsky**

**DATA 698 Analytics Masters Research Project**

**City University of New York**

**Advisor: Arthur O’Connor**

**March 17, 2019**

**Exploring the Relationship Between**

**Exonerations, Fatal Police Shootings and Crime in the United States**

**Introduction:**

Is the rate of exonerated individuals correlated with the rate of police shootings or the crime rate?

Inspired by the work done by the Innocence Project to exonerate those who have been wrongfully convicted, this study will explore factors that can be used to predict the likelihood of an individual being wrongfully convicted in the United States. The study aims to determine if there is a correlation between rates of crime and wrongful convictions. In addition, this study explores whether there is a correlation between rates of police shootings and exonerated individuals.

This research theorizes that high rates of violent crimes put pressure on law enforcement to more aggressively enforce the law. This strain may cause police to be more likely to fatally shoot an individual and may create a situation where there is more pressure to convict an individual, causing there to be a higher rate of wrongful convictions.

If the factors that contribute to situations in which an individual is wrongfully convicted of a crime can be predicted, steps can be taken to minimize the likelihood of such an event occurring. Likewise, if the pressures that contribute to fatal shootings by police officers can be predicted, steps can be taken to minimize its likelihood.

**Literature Review:**

The National Registry of Exonerations houses data on individuals who were exonerated for crimes and conducts research to identify trends and factors relating to wrongful imprisonment. Research conducted by the National Registry of Exonerations has identified racial disparities amongst people who were wrongfully convicted of crimes. Forty seven percent of wrongfully convicted individuals are black; this is three times higher than the proportion of black people in the United States. Black people who are innocent are seven times more likely to be convicted of murder than white people who are innocent. (Gross, 2017) A study entitled “The Race Effect on Wrongful Convictions” notes the unreliability of eyewitness testimony, particularly when based off cross-racial identifications. Seventy four percent of wrongful convictions that were overturned using DNA evidence came from cases that relied upon eyewitness testimony. (Rizer, 2003) There is an association between wrongdoing at the hands of police and race. A black person exonerated for murder is more likely to have encountered police misconduct. Black people are more likely than white people to be freed in group exonerations; groups of people who are exonerated together are often the result of the planting of drugs by police. (Gross, 2017)

Police shootings have received a considerable amount of media coverage recently (McLaughlin, 2015). Much of the focus regarding violence at the hands of police officers has centered around racial disparities (Gross, 2017). The percentage of black people shot by police in the United States is more than twice the proportion of black people present in those regions. (Fryer, 2018) Lopez suggests that the police in the United States shoot and kill many more people than police in other developed nations because of the prevalence of gun violence in the United States. Since the United States has more gun violence than other developed nations, the police use guns more often due to the heightened danger they face.

The number of police shootings can be linked not only to the rate of gun use by civilians, but the rate of gun ownership in the United States. The "American Journal of Public Health found that every 10 percent increase in firearm ownership correlated with 10 additional officers killed at the state level over a 15-year period." (Lopez, 2018) In the Northwestern Journal of Criminal Law and Criminology, Sherman identified a positive correlation between police killings and gun density, violent index crime rate, homicide rate, and arrests per 100,000 people. (Sherman, 1979) Hemenway also identified a correlation between police killings and violent crime rate. (Hemenway, 2019)

**Research Model and Hypotheses:**

Data of exonerated individuals is collected by the National Registry of Exonerations, which is a project of the University of California Irvine Newkirk Center for Science & Society, University of Michigan Law School and Michigan State University College of Law. The data includes the name, age, race, gender, age, county, worst crime displayed, additional crimes, year the crime occurred, year of conviction, year of exoneration, sentence and whether there was DNA testing for those who were exonerated for crimes in the United States. The exonerations occurred between 1989 and 2019 for crimes stemming from convictions that occurred between 1956 and 2017.

While the National Registry of Exonerations collects data on individuals who were exonerated for crimes they did not commit, there is no way to compile a complete list of individuals who were falsely incarcerated, as many of those individuals’ cases have not been overturned. Collecting complete data on police shootings poses a different challenge. States were not consistent in the ways in which they collected data, making the data collected before 2010 to be unreliable. (Banks, 2016) Sherman notes that police killings are under-reported. Data about the same location from different sources are not consistent. Despite inconsistencies in numbers, researchers have reached the same conclusions regarding correlations utilizing different sources of data. (Sherman, 1979)

Cities in the database of exonerated individuals will be mapped to counties using the SimpleMaps database.

Data of violent crime rates in United States cities is taken from the Federal Bureau of Investigation’s Uniform Crime Report, which is published each year. The data set includes the state, city, population, number of murders, rapes, robberies, aggravated assaults, property crimes, burglaries, larcenies, motor vehicle thefts, and arsons. Data on violent crime is available between 1999 and 2017.

Data of police shootings will come from multiple sources. The Washington Post retains database of police shootings from 2015 through 2019. The data set includes the name, date, manner of death, whether the victim was armed, age, gender, race, city, state, if the victim showed signs of mental illness, threat level, if the victim was fleeing and if the police officer was wearing a body camera. Vice News has a data set of police shootings from 2010 through 2016. This data set includes the date, name, whether the shot was fatal, if the subject was armed, race, gender, age, number of shots fired, number of officers present, officer’s race, officer’s gender, department, notes, city, and date. The data from Vice News will be used between 2010 and 2014, as the dataset from the Washington Post is more complete.

The first hypothesis theorizes that there is a positive correlation between the rate of exonerations and the rate of violent crime in counties across the United States.

The second hypothesis theorizes that there is a positive correlation between the number of fatal police shootings and the rate of violent crime in counties across the United States.

The third hypothesis theorizes that there is a positive correlation between the number of exonerated individuals and the number of fatal police shootings in counties across the United States.

The violent crime rate, exoneration rate and rate of police shootings will be compared by county in a given year. The rate of exonerations is the number of exonerated individuals divided by the population in the county. The crime rate is defined as the number of violent crimes divided by the population in the county. The FBI defines violent crimes as murder, non-negligent manslaughter, rape, robbery and aggravated assault. The fatal police shooting rate is the number of police shootings divided by the population in the county. The year the exonerated individual was arrested will be used to identify the crime rate and number of police shootings.

Trends and outliers in the data will be determined using box plots, scatter plots and histograms. The data will be assessed to see if it follows a normal distribution and is homoscedastic. The rate of exonerations will be plotted against the crime rate and rate of fatal police shootings, and the rate of fatal police shootings will be plotted against the crime rate. If the data is nearly normal, homoscedastic, and there is a linear relationship between variables, a Pearson correlation will be used to measure the extent of the correlation between the rate of exonerated individuals, fatal police shooting rate and crime rate. The statistical significance of the correlation will be evaluated using the p-value; a p-value less than 0.05 indicating a statistically significant relationship.

A multiple regression model will be built to predict the rate of exonerated individuals in a county based on the rate of fatal police shootings and the crime rate. The beta coefficients and R2 value will be assessed to determine the extent to which fatal police shootings and crime rate impact the number of exonerated individuals. If the model does not account for a high percentage of the variability in the number of exonerated individuals, the relationship will be explored by region in the United States, by size of city, and by cases of exonerated individuals whose conviction was due to government or police misconduct or incompetence.

A correlation between the number of fatal police shootings and the number of exonerated individuals will demonstrate that factors affecting these variables are shared. It will also bring to light that these two catastrophic outcomes should not be considered in isolation of each other.

Possible Path for data analysis and representation: I’m not sure where the data will take me and what will be appropriate. In addition to the analyses described above, if it makes sense, I will create chloropleth maps to shows population rates, fatal police shootings, rates of exonerations and crime rate.

**References:**

Banks, Duren, et al. “Arrest-Related Deaths Program Redesign Study, 2015-16: Preliminary Findings.” *Bureau of Justice Statistics (BJS)*, 15 Dec. 2016, [www.bjs.gov/index.cfm?ty=pbdetail&iid=5864](http://www.bjs.gov/index.cfm?ty=pbdetail&iid=5864).

Federal Bureau of Investigation. (2018). *Crime in the U.S.* [database]. Retrieved from https://ucr.fbi.gov/crime-in-the-u.s.

Fryer, Roland G. *Reconciling Results on Racial Diﬀerences in Police Shootings*. May 2018, scholar.harvard.edu/files/fryer/files/fryer\_police\_aer.pdf.

Gross, Samuel R., et al. *Race and Wrongful Convictions*. National Registry of Exonerations, 7 Mar. 2017, www.law.umich.edu/special/exoneration/Documents/Race\_and\_Wrongful\_Convictions.pdf.

Hemenway, D., Azrael, D., Conner, A. et al. J Urban Health (2019) 96: 63. https://doi-org.remote.baruch.cuny.edu/10.1007/s11524-018-0313-z

Lopez, German. “American Police Shoot and Kill Far More People than Their Peers in Other Countries.” *Https://www.vox.com/Identities/2016/8/13/17938170/Us-Police-Shootings-Gun-Violence-Homicides*, Vox Media, 14 Nov. 2018.

McLaughlin, Eliott C. “There Aren't More Police Shootings, Just More Coverage.” *CNN*, CableNews Network, 21 Apr. 2015, www.cnn.com/2015/04/20/us/police-brutality-video-socialmedia-attitudes/index.html.

National Registry of Exonerations. (2019). *National Registry of Exonerations* [database]. Retrieved from https://www.law.umich.edu/special/exoneration/Pages/informationandresearch.aspx.

Rizer, Arthur L. III (2003) "The Race Effect on Wrongful Convictions, "William Mitchell Law Review: Vol. 29: Iss. 3, Article 5. Available at:http://open.mitchellhamline.edu/wmlr/vol29/iss3/5

Sherman, Lawrence W., Langworthy, Robert H. Measuring Homicide by Police Officers, 70 J. Crim. L. & Criminology 546, 1979.

SimpleMaps. (2018). *United States Cities Database* [database]. Retrieved from <https://simplemaps.com/data/us-cities>.

Vice News. (2017). *Vice News Full OIS Data* [database]. Retrieved from https://news.vice.com/en\_us/article/a3jjpa/nonfatal-police-shootings-data.

Washington Post. (2019). *Fatal Police Shootings Data* [database]. Retrieved from <https://raw.githubusercontent.com/washingtonpost/data-police-shootings/master/fatal-police-shootings-data.csv>.