

UNDERSTANDING POLICE USE OF FORCE IN NEW JERSEY: DO  
CIVILIAN DEMOGRAPHICS INFLUENCE POLICE BEHAVIOR?

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## THESIS ABSTRACT

Understanding Police Use of Force in New Jersey: Do Civilian Demographics Influence

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In recent years, there has been increased scrutiny around the ways police officers use physical force while carrying out their duties. Though it is often necessary for officers to use force during arrests, there have also been innumerable cases of officers going beyond their mandate and inflicting unreasonable amounts of violence on civilians. In 2017, NJ Advance Media produced a groundbreaking report detailing the way New Jersey police officers use force while on the job. This paper will use the Force Report and other data to test for relationships between demographic factors and uses of force by police. Using multivariate regression analyses and GIS mapping software, the relationships between rate of use of force and race, income, education, political affiliation, and violent crime rate will be quantified and visually displayed for over 400 New Jersey municipalities. Using these methods, strong relationships between income, violent crime rate, and the use of force rate were found. The other independent variables had weaker relationships with the use of force rate.

## INTRODUCTION

Over 1,000 people were fatally shot by police in 2019 (Tate, 2018), capping off a decade which saw numerous high-profile cases of black men shot by police and intense public scrutiny over justice and racial discrimination in policing. One of the most shocking things about this statistic is that it comes from the Washington Post, a privately owned newspaper. The federal government of the United States does not, at this time, have an accurate count for the number of civilian deaths caused by police officers. From 2003 to 2009, the Bureau of Justice Statistics published a count for all of the “Arrest Related Deaths” in the country, which included deaths of people who were detained in jail, prison, and juvenile detention (Burch, 2011). In 2015 it redesigned the way it collected this data to narrow the parameters, focusing on deaths occurring during the course of an arrest and incorporating data from “open information sources, including news outlets and official agency documents, to identify potential arrest-related deaths.” (Arrest-Related Deaths Program Redesign Study, 2015-16: Preliminary Findings). Although not equal or exhaustive (Bacak, Mausolf, & Schwarz, 2019), media-based sources may be the most comprehensive source of information on this subject. The failure of the United States government to mandate police departments record this statistic demonstrates a lack of seriousness concerning police violence.

In 2014, Eric Garner was choked to death by an officer in broad daylight while repeating the phrase “I can’t breathe,” a phrase that continues to be a rallying cry for reformers across the country. One month later, Michael Brown of Ferguson, Missouri was shot by police officers, setting off protests that lasted weeks. Since these shocking

events, more and more people have asked whether police officers conduct arrests in ways that are truly constitutionally justifiable and equitable. Researchers in the criminal justice field turned their attention to this question and began to publish reports on police homicide, attempting to understand what was driving this kind of lethal behavior. As it stands, this literature focuses on deadly shootings, ignoring the fact that the vast majority of police use of force incidents do not turn lethal. Furthermore, the focus is often on large urban police departments, ignoring the activity of other local and municipal agencies that collectively employ the majority of sworn officers in most states.

Modern scholarship on police use of force is still developing and tends to be fragmented. Racial analyses of police uses of force, discussions of departmental policies and the case law around these policies, and analyses focused on cases where civilians have died at the hands of police officers dominate the current conversation, and with good reason (Burghart, 2017; Mock, 2019; Obasogie & Newman 2017). They all, however, have limitations that this research seeks to address. Considering the history of racism in the United States and continued racial inequities in criminal justice (Potter, 2015), it is clear why racial analyses would be at the forefront of researchers' minds when investigating police violence. However, what that research misses is whether more local environmental factors like income and education can help to explain the higher rate of police force use of force by racial and ethnic group. Looking beyond a racial lens not only provides experts with a multifaceted analysis of the issue, but could actually strengthen the argument that race is the biggest factor at play when it comes to officers using force on a suspect.

The same logic applies when it comes to researching deaths at the hands of police officers. When research focuses on deadly force data, it misses some of the nuances that arise when analyzing all types of force used by law enforcement. Data reveal that the vast majority of police incidents involving force do not involve the use of a weapon and do not cause injury (Astudillo, et al. 2018), so understanding the conditions that lead to force being used at all are of great importance to the field. Also, in research where data analysis was conducted on the subject of civilian deaths at the hands of police officers, it has compared major cities (e.g. Pryor et al., 2019) or states (Parker & Grey, 2019) in the United States to one another, whereas this paper will encompass all of New Jersey's 565 municipalities. Providing insight into smaller departments is vital to this topic because most police officers in the United States do not work at large departments; they operate in suburban and rural areas where a local police department rarely has more than twenty-four sworn officers (Banks et al., 2016).

One barrier to studying these elements of police force has been access to reliable statewide and non-lethal use of force data. The federal government records use of force statistics in only the most cursory way and does not break down the results into jurisdictions smaller than states (Hyland et al., 2015). In 2017, NJ Advance Media produced a groundbreaking report on the way New Jersey police officers use force while conducting arrests (Astudillo, et al. 2018). The Force Report is rich in detail and has already been used to write a number of reports on how frequently police officers in New Jersey use force, who they use it against, and which officers are most frequently in these incidents. By comparing the rates of force to the independent variables of race, income, education, political partisanship, and violent crime rate, this paper will investigate the

unspoken reasoning and implicit biases that may drive officers to do what they do. This is not to say that all uses of force are unjustified, as officers frequently protect civilians by incapacitating those that might do them harm. However, considering the attention currently being paid to the topic of police use of force, researchers should be investigating not only what has happened but the factors causing it to happen.

There will be five hypotheses tested in this research to help determine if demographic factors impact the way police officers use force. They are:

1. As the percentage of the municipality's population with a college degree increases, the use of force rate will decrease.
2. As the income per taxpayer of a municipality increases, the use of force rate will decrease.
3. As the percentage of the municipality's population that identifies as non-white (African American, Hispanic, Asian) increases, the use of force rate will also increase.
4. As the percentage of the municipality's population that is registered as Republican increases, the use of force rate will also increase.
5. As the violent crime rate of a municipality increases, the use of force rate will also increase.

Understanding what connections there are between the rate of police force and the demographic factors selected (education, income, race, partisanship, and violent crime) is important for three primary reasons. First, understanding how law enforcement officers use force will allow supervisors, legislators, and community stakeholders to better

modify the use of force guidelines. If the hypotheses in this research are supported by the data in significant ways, that would necessitate some response on the part of civil servants. Second, because this is such a sensitive and politically charged topic, testing for relationships between these demographic factors and use of force can help dispel myths and generalizations about law enforcement practices. Police officers perform an important function in our society so it is imperative that researchers inform the public of what the data shows, rather than allowing the small, unrepresentative sample of cases seen on the news to influence the formation of public opinion. Third, by breaking down the state into three regions, the analysis could serve to highlight important differences in the way police function in different locations. Northern, Central, and Southern New Jersey have significant differences from one another when it comes to demographic factors so the analysis done here could help local agencies and universities to deepen their understanding of a particular region.

## LITERATURE REVIEW

Evaluation of police use of force falls on a continuum of strictly legalistic approaches, suggesting that use and magnitude of force is tailored to the severity of each police-citizen encounter, and conflict/caretaker approaches, suggesting that the forceful enforcement of law is applied in a direction and magnitude dependent on the social location of a suspect (Black, 1972; Chambliss & Steidman, 1982). Variations on the conflict perspective, including perspectives on the behavior of law and minority threat, have emerged as ideal theories to posit why certain groups of citizens are more likely to come into contact with, and be forcefully engaged by the police. People who belong to the lower class in the United States, people who have less wealth at their disposal, are less educated, and live in areas with more violent crime are more at risk of experiencing police violence than their upper class counterparts (Black, 1972). Race and political affiliation are intertwined with class in America and each have a significant role to play in this analysis.

Donald Black's (1972) seminal work on police-civilian interaction, one of the most referenced pieces of literature on the subject, says that class is one of the most important factors in understanding how law is dispensed. He argues that social control in the form of violence done by officers is much more likely to occur in a "downward" direction, that people who are considered to be of lower social status will have more violence done to them (Black, 1978). There is significant support for this idea in the research that has been done on police violence, especially police shootings (Edwards et al., 2019; Nix et al., 2017). Race is one of the biggest predictors of police violence, with



non-white citizens being the recipient of significantly more violence than white citizens. Hughey (2015) argues that using what he calls “racial essentialism” as a way to understand this phenomenon misses the point that nothing in social interactions is ever caused by a single thing. Police officers’ personal ideologies and interactional patterns change the way they perceive threats, as do the dynamics of their particular institutions. So looking at multiple factors that can explain class status in addition to race is vital to the research being done in this study.

Officers on patrol are constantly being asked to make decisions, some of which have serious implications. What Klukkert (2009) points out is that the officers tasked with making these potentially dangerous decisions are often those that have the least amount of experience. Indeed, some research has sought to determine if the amount of training or experience an officer has is a better predictor of violence than any suspect characteristics. Other studies have focused on the demeanor of the suspect during the police stop, attempting to show that non-compliance with an officer’s directives is more predictive of violence than race, class, or other factors (Boivin, 2017). However, the issue raised by Hughey remains; an officer’s perception of what qualifies as non-compliance is greatly colored by their preexisting ideologies about the person they are arresting. While an officer may be following a use of force policy set by their department, they still have a huge amount of discretion when it comes to determining what ‘resistance’ is during a stop.

Discretion in how to interpret a suspect’s behavior is not the only difference between officers, there are also departmental differences at play. Barrett, Haberfeld, and

Walker's (2009) study comparing New Jersey police officers in urban, suburban, and rural departments, demonstrates that behavior officers deem threatening was not the only factor that led to force being used. Instead, departmental priorities greatly altered the responses of officers to hypothetical scenarios. This reinforces both what Wilson (1971) says about policing styles and what Pryor (2019) found about how the way police were recruited impacted how many use of force complaints they generated. Police officers are people that respond to outside influences and pressures like everyone else. It is not surprising, then, that officers operating in different departments, with different levels of experience and exposure to different patrol areas, react differently from one another.

What this paper seeks to do is test if any of the five factors contribute to the implicit biases of officers. Group threat theory (Taylor and Mateyka, 2011) identifies race as a major driver of police violence, which supports the hypothesis that race will emerge as a major factor in use of force rates. There has been some disagreement on that idea, with researchers pointing towards departmental goals or suspect behavior (Boivin, 2017) as more important so it is necessary to test this factor. Income and education were included as measures of class (as Black, 1972, argues), with the hypotheses being that police officers would use force less often when dealing with more educated and higher income people. Violent crime rates are unique because they are associated with lower class behavior (Markowitz and Felson, 1998) but also impact officers by inducing stress and thus, the urge to use force in situations that may not merit it (Klukkert et al., 2009). Based on Wilson's (1971) research on policing styles, which highlighted the political motivations of departments, a measure of partisanship was included, with the assumption

that Republicans would be more supportive of tougher, more violent, measures to contain criminal activity (Lind, 2017).

## METHODOLOGY

### **Data**

In order to test for relationships between the use of force by law enforcement officers on the citizens of New Jersey and the selected demographic factors, four data sources were utilized. The Force Report provided the statistics on New Jersey police departments uses of force between the years of 2012 and 2016. The New Jersey Databook, created by the Rutgers Center of Government Service, provided the statistics on race, income, political party affiliation, and education for New Jersey municipalities. To compare uses of force to violent crime rates, the Uniform Crime Report from the New Jersey State Police was consulted. Finally, the New Jersey Department of Environmental Protection's Bureau of Geographic Information System provided the shapefiles necessary to create visualizations of the data.

The use of force data set being analyzed was produced by NJ Advanced Media in conjunction with ProPublica. Together, these organizations requested, collected, cleaned, and codified information from every police department in the state of New Jersey. Since 2001, New Jersey law stipulated that officers who use force while making an arrest must file a report detailing how and why force was used. Unfortunately for citizens, researchers, and public servants interested in police accountability, these use of force forms were not collected or assessed in any meaningful way by the Attorney General's office, the NJ State Police, or any other major criminal justice entity (McCarthy and Sullivan, 2018). In 2017, after an officer in Carteret was accused of savagely beating a sixteen-year-old boy following a moving violation, NJ Advanced Media wanted to know

if the officer had a history of using excessive force. Months later, following a landmark Supreme Court of New Jersey case, the use of force records that had been quietly filed away for over a decade were made publicly available. “NJ Advance Media filed 506 public records requests and collected 72,677 use-of-force forms covering 2012 through 2016. They cover every municipal police department in New Jersey, as well as the State Police.” (McCarthy and Stirling, 2018) ProPublica was brought in as a partner to help cover the costs of cleaning and maintaining the collected data. The ensuing report and database were coined “The NJ Force Report” and will be referred to as such for the remainder of this work.

The analysis being conducted in this paper is narrow when compared to the amount of information available in the Force Report. Within the Force Report are dozens of factors like officer race, the type of force used, the location of the incident, and time of day that are not relevant for the purpose of this research. As such, once the Force Report was downloaded from the NJ Advanced Media site, it had to be manually cleaned to remove this extraneous information. The data cleaning process also included rearranging the data to be in alphabetical order by county and by municipality within each county. This made the data more manageable so it could be assessed for errors and outliers before running it through Stata or inputting the file to GIS. One thing that came out of this initial process was the discovery that out of New Jersey’s 565 municipalities, twelve names appeared in two or more counties. Because the statistical analysis and mapping tools would misinterpret these thirty separate townships as only being twelve, wrongfully combining their data and likely skewing the final results of the analysis, a suffix was added to their municipality name indicating which county they were located in. Once the

non-relevant information was removed, the file was organized alphabetically, and suffixes were added to the duplicate town names, the Force Report data file was considered clean. Unfortunately, because smaller municipalities are patrolled by the State Police and that department's data was not broken down by municipality, there are 80 municipalities that do not have usable force data.

The data collected from the New Jersey Uniform Crime Report was the easiest of the three sources to manage. Uniform Crime Reports are easy to access online and provide readers with the violent crime rate per 1,000 citizens. For this research, the data for violent crime rates was pulled from the 2012 report and arranged in a master file alongside the Force Report information. Municipalities were once again manually checked for accuracy, ensuring that all data was in the proper place. Violent crime rates from 2012 were used in order to best determine if they impacted use of force rates going forward. It was important to use crime rates rather than raw numbers of violent crimes because raw numbers do not account for the size of each municipality's population and this research is being conducted at the municipal, not county or state, level.

Rutgers University's Center of Government Service maintains a central database of New Jersey statistics that was utilized to collect the other demographic data points for this study. The data available in the data book comes from "from a variety of federal, state and county government sources including the U.S. Census Bureau; departments within New Jersey state government, including: Labor and Workforce Development; Human Services; Community Affairs; the N.J. Divisions of State Police, Taxation; and County Boards of Election." (New Jersey Data Book) There are twelve sections from

which users can pull data, but for this study, information was pulled from the “Population”, “Fiscal Resources”, and “Voters & Turnout” categories. While there is a “Crime” section in the data book, it only provides the raw number of violent crimes committed in a given year, information not suitable for the purposes of this research. The variables that were selected from the aforementioned categories were “% African American”, “% Asian”, “% Hispanic”, “% College Graduates”, “Income per Taxpayer”, “% Registered”, as well as “% Republicans” and “% Democrats”.

Some adjustments were made to create more straightforward variables to use in the maps and analysis. Rather than mapping three separate categories that dealt with race, the percentages of people identifying as African American, Asian, and Hispanic were combined to create the single variable of “% Non-white”. While some amount of nuance will be lost in the maps (because police officers may not view all non-white racial groups the same way), this allowed for a single variable to be analyzed for each municipality. Hispanic and Black groups were analyzed individually for all statistical analyses. When it came to measuring partisanship, the percent of a municipality’s population that was registered to vote as either a Republican or Democrat was used rather than vote totals from individual elections. In New Jersey if a voter wants to participate in a political party’s primary election, they must be registered as a member of that party. This policy should increase the number of people who are registered as members of a party as opposed to those who indicate no party preference. Furthermore, registering as a member of a specific political party indicates a level of partisanship that likely goes beyond a single election. Looking at election results, especially presidential election results, a town’s partisan lean may be distorted. People may vote for one party when considering

matters of national importance like climate change, but in the opposite direction when it comes to issues that are closer to home, like the building of affordable housing units or new taxes to fund school systems.

Using a voter's party registration rather than election results was a simple way of telling which party had more support in a given municipality, and as a result, how that local government is likely to operate. The measure of partisan lean was created by taking the percent of registered Democrats in each municipality and subtracting the percentage of Republicans measured in that same municipality from it. Results between zero and negative twenty indicated a Republican lean and results that were between zero and twenty indicated that the municipality was more prone to elect Democrats. Results that exceeded negative twenty and twenty fell into the strong support categories. The rest of the data for independent variables was used in the same form it was collected in, but race and partisanship both required a new variable.

## **Analysis**

Geographic Information Systems (GIS) software was used extensively in this research so experts and non-experts alike could look at the distribution of the selection variables across New Jersey and draw conclusions based on these maps. All eighteen of the maps created will appear in the Appendix at the end of this work. In order to make the maps as large as possible, and thus, easier to read, the state of New Jersey was split into three regions: North, Central, and South. As previously mentioned, this also allows for region-specific analyses of the results, hopefully helping local governments make sense of the findings. These regions were created by consulting the state's own publications



(Dept. of Workforce and Development) as well as the Governor's recent proclamation that Central Jersey does, in fact, exist (Gambardello, 2019). Northern New Jersey is made up of Bergen, Essex, Hudson, Morris, Passaic, Sussex, Union, and Warren counties. Central New Jersey includes the counties of Hunterdon, Mercer, Middlesex, Monmouth, and Somerset. And Southern New Jersey consists of the last eight counties: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Ocean, and Salem. The maps themselves were rotated to best fit onto the page and Southern New Jersey's map was smoothed out using the "Simplify" tool in QGIS to improve readability. This eliminated coastal imperfections on the map that had caused visibility issues in previous iterations. Readability was also why Southern New Jersey's maps were arranged using a portrait rather than landscape orientation.

Using the shapefile provided by the New Jersey Government on their Department of Environmental Protection's Bureau of Geographic Information System's website (NJDEP Digital Downloads), three base maps were created. Before the maps could be linked to the master file containing all of the data collected, one final adjustment had to be made to the master file. Once again, the file had to be manually checked to ensure that all of the municipalities on the master file matched the municipalities listed on the shapefile for the state. QGIS, the program being used to do the mapping, is case sensitive and had the same issue with duplicate names as the Force Report data. Once all the municipalities matched in the shapefile and the master file, the mapping process could begin. The base maps for Northern, Central, and Southern New Jersey were joined with the master file in QGIS and six maps, one for each variable, were created for each region.

The maps were created by using the “Graduated” feature in QGIS, which color codes each municipality according to the selected data’s range. Categorizing the data using the “Natural Breaks” feature produced a histogram of each set of data and created ranges that best fit the spread of results. These program-created breaks were manually rounded to more simple numbers (for example, by making 13.8 into 15) that would not drastically alter the range of results, but would be easier for readers to interpret. All the maps have between four and six categories and the same colors were used in each map (other than partisan lean, which used a red/blue scheme) to create the maximum amount of continuity for readers. Also, for continuity’s sake, the ranges for categories remained the same across the maps other than for income (because Southern New Jersey’s income range was noticeably lower than Central and Northern New Jersey’s) and when it came to outlier categories. If a map had a number of municipalities that did not fit within the normal range of results like in Figure C-1, an extra category was listed to account for these results. These outlier categories have varying maximum results that reflect the municipality with the largest result for that data.

While mapping the data gives us a general idea of the relationships between demographic factors and the use of force rate in New Jersey, the association of community factors and police force was further explored using negative binomial regression models. Negative binomial models were chosen for the analysis given that the outcome variables employed in this analysis (use of force incidents) are count variables which displayed significant skew. In the first stage of a regression analysis, bivariate associations were estimated between each of the five independent variables and total force incidents. The z-score for each bivariate relationship is provided. Once those tests

were completed, a multivariate analysis was done to see the strength of each variable when they were all taken into consideration at once. Because the master file was already created and Stata functions without the need for additional cleaning, the process of running the tests was as simple as adding the right coding instructions into the program and analyzing the results. These will appear after the mapping results in the following section and will provide statistical backing for the results displayed on the maps.

## RESULTS - MAPPING

### **Education**

A good portion of northern New Jersey residents have college degrees, which according to the hypothesis, should correspond with an overall lower rate of use of force incidents. This hypothesis does appear to have support looking at Figures A-1 and A-2. In the more urban areas of Newark and Jersey City, there are less people with college degrees and in those same areas, the rate of force used by police noticeably increases. In the northeastern corner of the state, there is support for the hypothesis as well, with large numbers of the populace holding college degrees and almost all of these municipalities falling into the lowest category for police uses of force. These results show evidence of a relativity effect, meaning when there are some people in a town with college degrees, but more college graduates in the bordering municipalities, the towns with less college graduates tend to be the recipient of more force. This is seen in Millburn Township, which has the largest proportion of college graduates in the area and the least uses of force. Its neighbor Maplewood has lots of graduates, but not as many as Millburn, and so ends up with higher rates of police violence. Hopatcong is the same in that it has some, but not many graduates, compared to its neighbors, and has higher rates of force than all of them. That said, the connection is not perfect, places like Caldwell and Fairfield have very high rates of education and still experience plenty of force at the hands of police.

Central New Jersey is the most complicated region to compare education rates to use of force rates for two reasons. First, central New Jersey is the most educated region in the state, so the effect of education appears to be diluted. Second, it is home to many

coastal towns that experience skewed use of force rates because of vacationers in the summer months. For the most part, Figure B-2 supports the hypothesis; more education does translate to less uses of force by police officers (and vice versa) in central New Jersey. Fair Haven is a good example of the relationship, it has the most graduates in its area and is surrounded by towns with higher uses of force. We also observe what appears to be a density effect when looking at Trenton and its suburbs, education is higher outside the city and use of force is more common in the urban areas.

Despite having the most areas patrolled by State Police and thus, less use of force data available, southern New Jersey also seems to lend support to the hypothesis that more college graduates leads to lower use of force rates. The coastal towns and missing data certainly do not help with this analysis, but using the available data, it is evident that the relativity principle is at work again in Figures C-1 and C-2. While south Jersey has the fewest college graduates, places that have higher proportions of college graduates than their neighbors do appear to have lower rates of force. The Woolwich area in particular demonstrates this; while the percentage of college graduates does not surpass 52% of the population, it has the lowest use of force rate in the area. Neighboring towns like Paulsboro and Glassboro have much lower proportions of college graduates and have between over 15 uses of force per 1,000 citizens. Even when the difference in college graduates is not huge, relative variance of educational attainment appears to be a predictive factor of force.

## **Income**

Turning to income, areas with lower incomes have a higher use of force rate and vice versa. The relationship in northern New Jersey (Figure A-3) is most apparent in the Newark / Jersey City area (the southeastern corner of the region), where use of force rates are highest on average and income is low. What is interesting is that only a few miles away from these lower income municipalities, a cluster of higher income towns experience noticeably lower use of force rates. Out of all fifteen municipalities that fall into the highest two income brackets (making upwards of \$110,000 a year), only four have use of force rates above two uses of force per 1,000 people. Those municipalities are in the next lowest group for use of force rate, with between two and six uses per 1,000 people. The same is true in reverse; of thirty municipalities in Northern New Jersey that have force rates of over ten incidents per 1,000 people, only four of them have incomes above \$65,000 a year. The hypothesis claiming income and use of force would be inversely related appears to have significant support in Northern New Jersey.

Central New Jersey also appears to support the hypothesis that municipalities with higher income experience less violence at the hands of police. In the northwestern part of the region, where Tewksbury and Far Hills are, has the highest income in the region and some of the lowest rates of force. The inverse of that same relationship is seen in Trenton and in Perth Amboy, where income per taxpayer is under \$35,000 and the use of force rates are in the fifteen to thirty (per 1,000) range. Coastal communities can be outliers, but even in those small communities, income appears to have an impact. This relationship is not uniform though, in the suburban townships that occupy the middle of the region both income and rate of force are on the lower end of the spectrum. Income and force seem most related when looking at the extreme ends of the income distribution.

Income in Southern New Jersey is significantly lower than in the other two regions of the state (as mentioned in the methodology section). Because of this, the categories for income were adjusted. Even so, most municipalities fall into the bottom two categories for income. Southern New Jersey also has the greatest number of municipalities patrolled by the State Police, which compounds the difficulty of this particular analysis. Force is used more frequently in Southern New Jersey in general as well. With those caveats, it appears that in Southern New Jersey the connection between income and use of force rate is the weakest in the state. Something to consider is the relativity of wealth. In places that are not in the top income categories but are still out-earning their neighbors, does the rate of force noticeably change? There are pockets of municipalities that have higher incomes and lower rates of force, like the Chesterfield (the area near the Northwest tip of the region that is yellow and orange in Figure C-3 and mostly blue in C-1) and Harrison (the pocket of orange income in the mid-west part of the region) areas. The areas with the highest use of force rates do not uniformly have low incomes though. Places like Toms River and Pennsville both have high rates of force and middling incomes. Overall, the distribution of income is so flat the maps appear to show that while there is a relationship between income and use of force rates in Southern New Jersey it is the weakest in the state.

## **Race**

Race is the factor covered most frequently in the literature regarding police use of force and civilian death. Starting with northern New Jersey (Figure A-4), there is a significant relationship between the percent of non-white citizens in a town and that

police department's use of force rate. Two stretches of municipalities on the eastern part of the region have significantly higher rates of non-white citizens than the rest, from Linden to Paterson (the non-coastal towns) and from Jersey City to Teaneck (the strip of municipalities closer to and on the coast). It comes as no surprise that the municipalities between Linden and Paterson have the highest rates of police force, but is unexpected that Teaneck has such a low incidence of force. The cluster of towns in the center of the region also shows support for the race and force hypothesis. Wharton, Dover, and Mine Hill all have high rates of non-white citizens and experience much more violence at the hands of police than their neighbors. The relationship is not perfect, as the southwestern tip of the region shows, but the relationship between race and force is strong in this map.

In central New Jersey, the connection between race and use of force is less pronounced. From Trenton (the southern middle part of the region) all the way to Edison there is a strip of municipalities that have high proportions of non-white citizens, which, according to the hypothesis, should have higher rates of force. What is interesting is that in Edison and Trenton the rates of force are high, but in the center of the region rates drop significantly. As previously discussed, the coastal towns are less reliable as indicators because of the amount of force that ends up being used during the summer vacation months. Because places like Perth Amboy and Trenton are both urban centers, a person might be tempted to say that the density of the population is what accounts for the increase of force, not the race of people living in the cities. This argument is exactly why rates and percentages were used instead of raw numbers for this analysis. A municipality that stands out because of its opposition to the hypothesis is Piscataway, whose population is over 65% non-white and has less than four uses of force per 1,000 people.



Southern New Jersey experiences the most amount of force at the hands of police officers in New Jersey, which may dilute the results concerning use of force. To account for the coastal towns and some of the smallest towns in the region, an outlier category was added to the map. Plenty of this force lines up with the non-white population of towns, but a number of municipalities experience higher rates of force with practically all white populations. The northeastern part of the region especially stands out as having very few non-white citizens and still has middling rates of force. With that in mind, the region of southern New Jersey has the weakest relationship between race and force of the three regions, but the connection is still evident. The span of municipalities across the center of the region shows this connection, as do the municipalities surrounding Camden.

### **Partisanship**

In northern New Jersey, partisan lean appears to be determined primarily by population density, with the most urban areas in the region leaning more Democratic than rural areas. The challenge with this comparison is that due to the population density, many of the more rural areas that strongly support Republicans also do not have their own police forces, meaning their data is unavailable for use of force rates. That said, the hypothesis about partisanship does not appear to be supported by the maps. If there is any connection between partisanship and use of force rates, it would appear that the more strongly a municipality supports the Democratic party, the higher their police department's use of force rate. The area in the southeastern tip of the region has higher use of force rates and skews heavily Democratic and has noticeably higher use of force rates. While Washington Township and Washington Borough both skew Republicans and

are near the top of the use of force rate scale, the data appears to show a significant relationship between higher force rates and Democratic voters.

Figure B-1 and Figure B-5 display the partisanship-force relationship in Central New Jersey, which mirrors what was seen in Northern New Jersey. Areas that have a higher concentration of voters registered as Democrats also have higher rates of force. This inversion of the hypothesis may actually be more pronounced in Central New Jersey because the western part of the region, which supports Republicans strongly, also has some of the lowest rates of force in the region. The strip of Democrat-leaning municipalities that stretches from Trenton to Carteret has higher use of force rates in the more densely populated areas than the more suburban areas, similar to what was seen in the northern region of the state. But the overall comparison between Figures B-1 and B-5 shows that the relationship between partisanship and force is moderate and is in the opposite direction predicted by the hypothesis.

In Southern New Jersey, it again seems that the hypothesis of Republican-leaning municipalities having higher rates of force is not supported by the data. Some of the coastal municipalities, especially in the southernmost tip of the state, support Republicans but have moderate rates of force. The area around Camden, the region's largest city, is deeply Democratic-leaning, and has some of the highest rates of force in the region. In the northeast corner of the region the results are more mixed; Republican leaning municipalities have varying use of force rates, but on the whole, the places with higher rates of force lean Democratic. If the state police had submitted municipal level data, this section would have been much more informative, because Southern New Jersey has lots

of rural areas where there is partisanship data but no use of force rates. In general, the connection between these two variables looks strong, and in the opposite direction of the hypothesis made at the start of this study.

### **Violent crime**

Looking at the northern New Jersey maps of violent crime rate (Figure A-6) and police use of force (Figure A-1) there is a relationship between the two factors, though it appears fairly moderate. For instance, we can see that the municipalities with the highest rates of violent crime generally have elevated rates of force, but they do not consistently have the highest use of force rates. The city of Newark and the surrounding municipalities of Elizabeth, Irvington, and Orange, all have the highest incidence of violent crime per 1,000 people. When looking at those same municipalities' use of force rates, they fall into the middle category of ten to fifteen uses of force per 1,000 citizens. Alpha borough, Fairfield, Teterboro, and Washington Township are the municipalities with the highest rates of force by police. Something to note here is that Teterboro and Alpha boroughs have very small populations, which likely skews the way the data maps. The Jersey City / Newark area certainly is the epicenter of both violent crime and use of force, but the use of force rates are not in either of the top two categories (between fifteen and sixty uses of force per 1,000 citizens). Most northern New Jersey municipalities fall into the two lowest categories when it comes to use of force, with less than six uses of force per 1,000 people. The same is true for violent crime, where more densely populated areas experience higher violent crime rates, but the majority of these municipalities have less than one and a quarter violent crimes per 1,000 citizens. When looking at northern

New Jersey it does appear that there is a fairly strong relationship between violent crime rate and use of force.

In central New Jersey the relationship between the two variables is less strong. Only one municipality on the eastern coast is in the highest category for violent crime rate, while almost all of these beach towns have use of force rates in the top categories. In fact, some of these towns had such extreme use of force rates that an outlier category was added to the map. The explanation for this inconsistency in the data is likely due to the small populations of these municipalities coupled with the influx of visitors during the summer months. That said, the relationship between violent crime rates and use of force rates is apparent outside of these coastal towns. Trenton and its neighbors have elevated rates of violent crime compared to the rest of the region, which correspond with higher use of force rates. Some areas, like New Brunswick, also appear to support the hypothesis that violent crime rate and use of force rates are positively associated. But stark differences in the smaller towns like Calipon, Matawan, and Somerville show that violent crime rate can be very low but use of force rates can still be relatively high. In looking at Figure B-6, there is certainly some relationship between these variables, but it does not appear to be exceptionally strong.

Southern New Jersey is the most rural region of the three and as such, has the most area patrolled by the state police. As discussed in the methodology section, it was not possible to parse out the location of each use of force from the aggregated State Police use of force data. The same phenomenon happens along the coast in south Jersey as it did in central, with vacation towns having much higher use of force rates than one

would expect based on their violent crime rates. The exceptions are Wildwood borough, Atlantic City, and Seaside Heights, which all fall into the highest categories for both violent crime rate and use of force. In Figure C-6, there is a relationship between these two variables, but it is not uniform throughout the region. Some areas' relationship between variables matched the hypothesis perfectly, while others seem to have no relationship at all between variables. Just as often as municipalities with low violent crime rates and elevated use of force rates appear, there are towns with higher violent crime rates where police forces that do not use force nearly as much as one would expect. There must be other factors at work and the violent crime rate alone cannot explain the differences in rates of use of force.

## RESULTS - STATISTICAL ANALYSIS

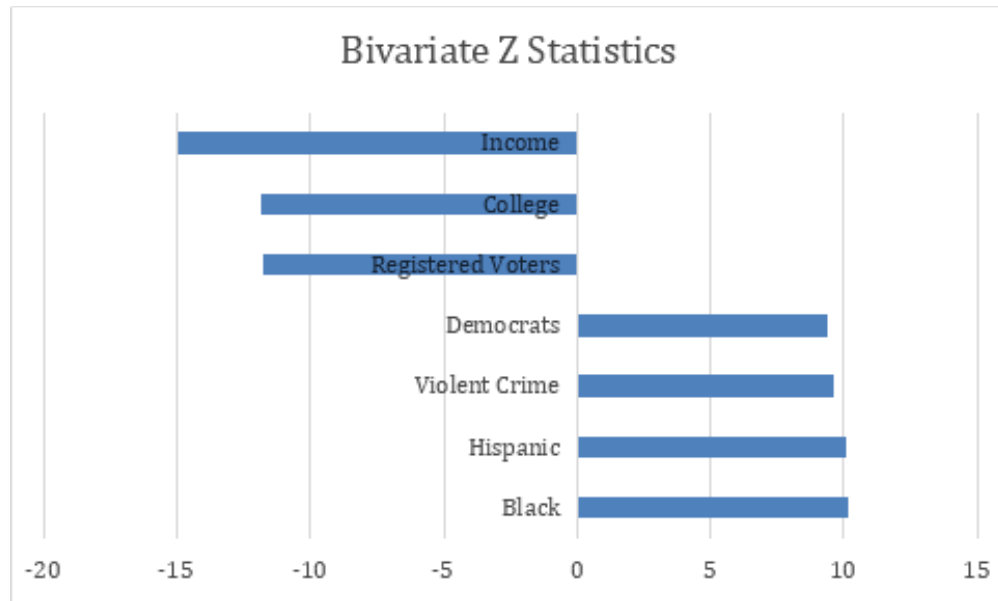
Following the mapping analysis, the data was entered into Stata to assess the statistical relationship between the selected independent (demographic) and dependent (use of force) variables. Black and Hispanic/Latino racial groups were analyzed separately in this section to account for differences in behavior patterns and police perception. A cross correlation matrix seen below was created in order to understand the ways in which independent variables are related to one another. Some of these relationships are self-evident and need no explanation, like the significant positive (0.8062) relationship between Hispanic population and non-white population. In other cases, the correlation matrix shows relationships between variables that give context to findings subsequently discussed in the study, like the association between non-white population and the proportion of registered Democrats in a municipality (0.6789).

	lgbudget	lgincome	democr~2	republ~2	nonwhite	africa~n	hispanic	regist~n	vio~1000
lgbudget	1.0000								
lgincome	0.2637	1.0000							
democrats2	0.0627	-0.4013	1.0000						
republicans2	0.0270	0.4363	-0.8725	1.0000					
nonwhite	0.0601	-0.4302	0.6789	-0.7089	1.0000				
africaname~n	-0.0730	-0.4508	0.5670	-0.5356	0.6978	1.0000			
hispanic	0.1050	-0.4532	0.5111	-0.5201	0.8062	0.3138	1.0000		
registered~n	0.0930	0.5242	-0.4362	0.5449	-0.7279	-0.4082	-0.7003	1.0000	
violent~1000	0.3450	-0.2557	0.1958	-0.1783	0.2736	0.2651	0.2591	-0.2029	1.0000
collegegrads	0.2286	0.8183	-0.2865	0.2932	-0.3204	-0.4261	-0.3816	0.4609	-0.2773

Income has strong positive relationships with the percent of college graduates in a municipality (0.8183) and the percent of a municipality's population that is registered to vote (0.5242). This indicates that as the average income per taxpayer in a municipality increases, so do its number of college graduates and registered voters. Another notable

relationship is between violent crime rate per 1,000 citizens and income (-0.2557), showing that as income rises, violent crime rate decreases. The opposite was true for violent crime rate and the percent of a municipality's population that is non-white (0.2736). Another relationship that stands out in the matrix is between the percent of non-white citizens in a municipality and the percent of the municipality's population that is registered to vote (-0.7279). These relationships add depth to the discussion of why police use of force rates are correlated with certain demographic factors and highlight relationships that could be studied in more depth in future research projects.

The bivariate association between each of the independent variables and total force incidents was examined via a negative binomial analysis. In this step, the total number of force incidents was regressed on each of the predictor variables in turn, with each model offset by the municipal population. The figure below reveals the z-statistic associated with each bivariate relationship. In this study, the percentage of registered voters, the percentage of the population with college degrees, and the median income of residents were negatively associated with force. Both racial categories, voters registered as Democrats, and the violent crime rate were positively associated with force incidents with about the same strength. The two largest z scores (representing the magnitude of the relationship between variables) found were for the relationships between a higher personal income, people with college degrees, and less use of force incidents. Large z scores for these categories lends support to the theory that police officers are less inclined to use force on people of higher class status. The two smallest z-scores were found for the percent of the population that registered to vote as democrats and the violent crime rate.



To ascertain the relative importance of the predictor variables, all items were entered into a model together estimating the total number of force incidents (Table 1) and the number of force incidents where a gun was used by an officer (Table 2). Partisan lean is not present in these tables because it demonstrated strong collinearity with the race and violent crime rate variables. Rather than abandon the concept of measuring the impact of politics entirely, a different measure of political participation, the percentage of the municipality's population that is registered to vote, was used. While it did not end up being significant in the multivariate analysis, it provided insight into whether or not political participation had an impact on force rates, all else held constant.

Looking at table 1, there is only one variable, the percent of citizens registered to vote, that is not significant when taking all other variables into account. Both racial categories, the municipal budget, average income, percent of municipal population with a college degree, and the violent crime rate all were significant when it comes to influencing the use of force by police officers. The results show that a one percent



increase in the percentage of the black population is associated with about a two percent increase in the incidences of total force ( $p=0.004$ ), with the same being true of Hispanic residents. Violent crime rate was a significant factor in the multivariate analysis, producing about a nearly fifteen percent increase in force incidents for each unit increase in violent crime rate. This represents a greater total impact on uses of force than both racial categories and the education category. For each one percent increase of citizens with college degrees, uses of force increased by roughly three percent. The median income was significant and had a large impact on force, with every one percent increase in income resulting in a 57 percent decrease in use of force incidents.

Table 1: Negative Binomial Regression Analysis of Any Incident of Force 2012-2016

	IRR	SE	P
%Hispanic	1.017	0.006	0.003
%Black	1.017	0.006	0.004
Violent Crime	1.144	0.040	0.000
%Registered Voters	1.001	0.005	0.980
% College Ed	1.026	0.010	0.015
Median Income (lg)	0.429	0.090	0.000
Observations	482		
Chi2	275.40		

Below, the model was re-estimated, looking only at the use of force incidents that involved a firearm. Since these get more attention in both the news media and use of force literature, it seemed appropriate to investigate if these incidents differ from other use of force incidents. The results show that two of the variables that are significant

above, do not maintain their influence when it comes to firearm incidents. The percent of Hispanic people in a municipality, median income, and percent of people registered to vote all do not meet the standards to be considered statistically significant. The percent of the population that is Black, the violent crime rate, and the percent of the municipality with a college degree are significant when it comes to firearm incidents. All else held constant, the violent crime rate in a municipality is the most important factor when it comes to police shootings. For every one percent increase in violent crime rate, there is a twenty eight percent increase in firearm incidents. When the percent of the population with a college degree increases by one percent, the number of incidents involving firearms decreases by just under eight percent. For each one percent increase of the Black population, the total number of officer involved shootings goes up by roughly three percent.

Table 2: Negative Binomial Regression Analysis of Firearm Incidents 2012-2016

	IRR	SE	P
%Hispanic	1.099	0.012	0.421
%Black	1.032	0.011	0.002
Violent Crime	1.284	0.136	0.018
%Registered Voters	1.016	0.016	0.329
% College Ed	0.925	0.024	0.003
Median Income (lg)	1.057	0.573	0.919
Observations	482		
Chi2	92.61		

## DISCUSSION

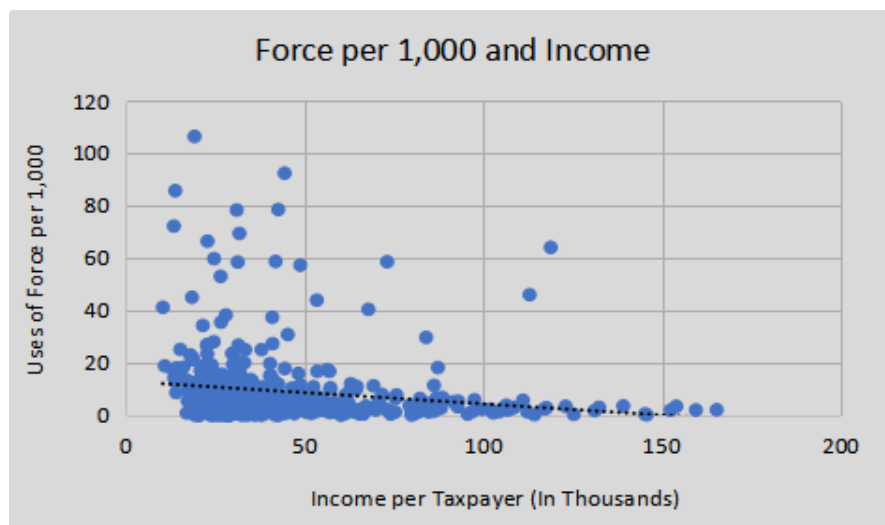
Having looked at the maps, the bivariate association between variables and the use of force rate, as well as the multivariate analysis of seven demographic factors, it is time to revisit the hypotheses made at the start of this paper. The five hypotheses tested are as follows:

1. As the percentage of the municipality's population with a college degree increases, the use of force rate will decrease.
2. As the income per taxpayer of a municipality increases, the use of force rate will decrease.
3. As the percentage of the municipality's population that identifies as non-white (African American, Hispanic, Asian) increases, the use of force rate will also increase.
4. As the percentage of the municipality's population that is registered as Republican increases, the use of force rate will also increase.
5. As the violent crime rate of a municipality increases, the use of force rate will also increase.

Due to the large degree of discretion given to police officers in how they enforce the law and use violence (because most use of force policies justify force based on an officer's perception of the threat) (Obasogie and Newman, 2017) an officer's perception of the people they interact with is incredibly important (Boivin, 2017). The results of the mapping and the regression analysis show that in the 485 municipalities that made use of force data available, four out of the five hypotheses are supported. Republican

partisanship as expressed by voter registration was not a predictor of police force, in fact it had a negative relationship with the use of force rate according to Figures A-5, B-5, and C-5. The remaining four hypotheses, concerning income, race, violent crime rate, and education, all were supported to varying degrees by the maps and regression analyses. The focal point of this research was to ask if civilian demographics impact the way that municipal police officers use force, and the data appear to support the fact that demographics influence the rate of force.

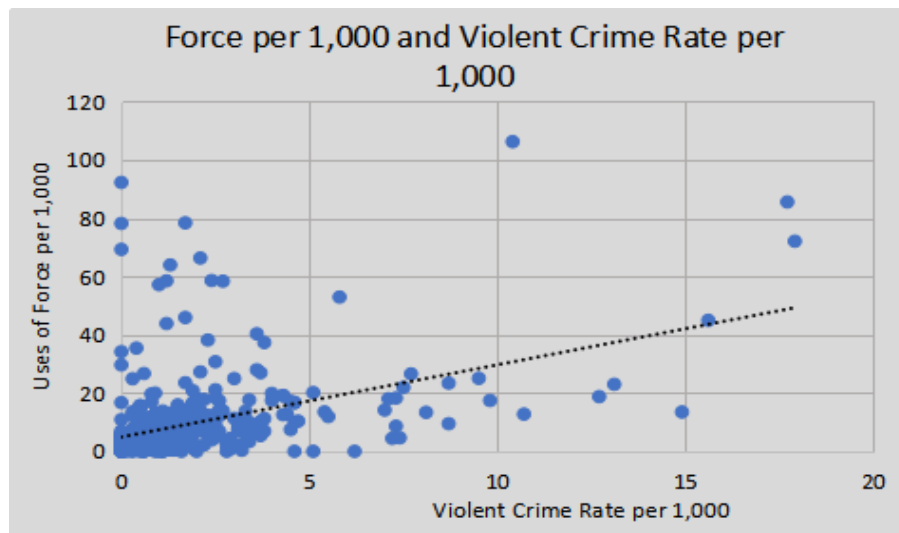
What the results in the previous section might demonstrate, without crossing into psychological analysis, is that officers appear to have ideas about what a dangerous person might like and the kind of town they live in, which in turn influences on whom they are likely to use violence. When holding all other factors constant, income was the most influential factor in predicting use of force. The trendline in the graph below shows how use of force rates decline as income increases.



*Note: To improve the readability of Scatterplot 1, twelve outlier municipalities (six with high incomes, six with high use of force rates) were excluded from the graph. They are listed in the Appendix.*

According to the statistical analysis and maps, increases in income produced large changes in how officers used force. It may be surprising that race was not the strongest determinant of police behavior considering the use of force statistics across the country (Hyland et al., 2015). But, in New Jersey, specifically, it appears that race takes a backseat to economics. The maps for income (Figures A-3, B-3, and C-3) all had clearer relationships with use of force rates than did the maps depicting race (Figures A-4, B-4, and C-4), especially when looking at southern New Jersey. It could be that income is related to race (because of structural racism in the American economic system), but according to this kind of analysis income is the strongest predictor of police using force.

Violent crime rate had the next largest impact on police use of force rates after income. The hypothesis stated that as violent crime rate increased, so too would the use of force rate. Based on both the statistical analysis and mapping, this hypothesis is supported. Below is a scatterplot showing the relationship between violent crime rate and uses of force, which has a steep trendline.



*Note: To improve the readability of Scatterplot 2, thirteen outlier municipalities (six with high incomes, one with a high violent crime rate, six with high use of force rates) were excluded from the graph. They are listed in the Appendix.*

Violent crime rate could be related to uses of force for a number of reasons. One explanation is that officers are being confronted with serious threats and as such, are using force to control a situation where a suspect has done or is preparing to do harm to themselves or others. Another possible explanation is that officers patrolling areas with higher violent crime rates are aware of the violent crime rate and in turn are more concerned for their safety. This could lead to officers using force more quickly and less judiciously in order to control a suspect they perceive as potentially dangerous. Due to the strong nature of this relationship, researchers should continue to explore how violent crime rate impacts police uses of force.

Race and college education rates were also predictors of the use of force rate, which supports the hypothesis. While the effects were not the largest found in the study, looking at the maps, use of force rates do increase as the percentage of non-white citizens rises and fall as the percent of college graduates increases. The regression analysis showed a rather small but positive relationship between Black and Hispanic populations and the use of force rate. Education was unique because its impact on use of force rates were much more pronounced when it came to force incidents involving firearms (a 7.5 percent reduction in firearm incidents for every 1 percent increase in college graduates) than all uses of force (2.6 percent increase in uses of force for every 1 percent increase of graduates). A regression result showing that more college graduates leads to an increase in all uses of force is surprising, but the fact that the maps showed strong support for the

hypothesis and the reduction in firearm incidents was roughly three times larger than the unexpected increase demonstrated without question that as education increases, the use of force rate drops. Analyzing the maps and statistical analysis together, Black's theory on how social status determines the dispensation of law, (which greatly influenced the hypotheses) finds significant support. Municipalities with less education, lower incomes, and more non-white citizens all experienced higher rates of police violence.

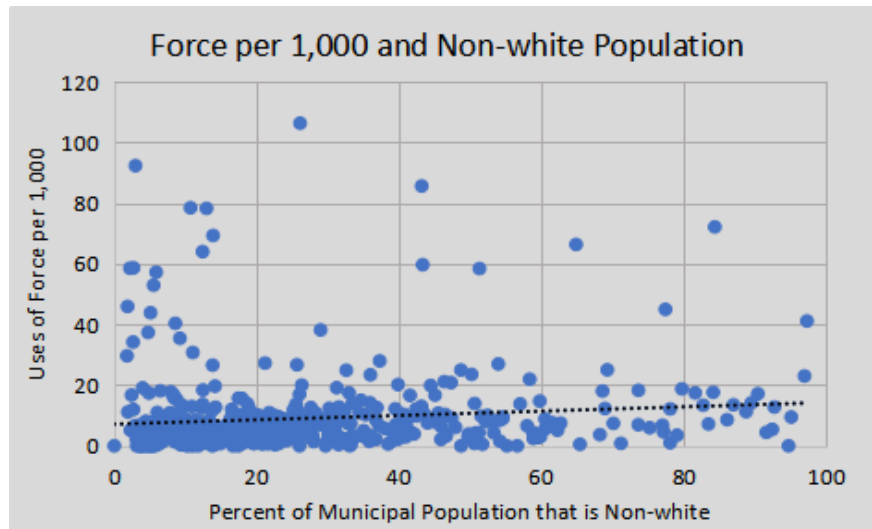
The hypothesis concerning political partisanship did not find support in this study. Though people who are registered to vote as Republicans in greater numbers may support a police force that is 'tougher' on crime (Arthur and Case, 1994), they do not appear to be the recipients of such policies. In fact, the opposite was observed, with Democratic leaning municipalities experiencing noticeably more force at the hands of police than Republican areas. Wilson's (1971) research argues that a Republican dominated municipality should lead to a watchman style police department that focuses on law enforcement rather than order maintenance. Zhao (2005) however, reasoned that due to changes in culture over time, politics does not impact local police department priorities to the extent they once did. Based on the data analyzed for this study, it appears that either partisanship does not influence law enforcement decisions the way Zhao argued, or other factors (like race and violent crime rate) are so intertwined with political leanings that they drive the use of force rate up, overshadowing any impact partisanship would have on police decisions.

When it came to force incidents involving a firearm, violent crime rate and education were the most important factors. This is interesting because education had a

relatively small impact on all force incidents, but is the second most impactful factor when it comes to the more dangerous interactions. In the maps, education did appear to influence uses of force, but not in a particularly consistent manner. It may be that there was collinearity between income and education, causing it to stand out in the firearm results (where income was not statistically significant), but be overshadowed in the total use of force results (where income was statistically significant). Violent crime rate had the largest impact on firearm incidents, which, considering income was not significant in the analysis of firearms incidents, was to be expected.

Race being relevant in the shooting incidents comes as no surprise, as there is ample research available showing that Black citizens in the United States are victimized by police officers in shooting incidents at higher rates than their white counterparts. While the Hispanic population was not statistically significant in the firearm analysis, for each one percent increase in the Black population of a municipality, its rate of firearm incidents went up by roughly three percent. What is compelling about these results is the extent to which violent crime rate and education outweighed race as a determinant of firearm incidents. Looking at the maps could help to explain this phenomenon. It appears that higher violent crime rates and lower incomes were common in areas with high proportions of non-white citizens. This collinearity of factors could dilute the impact of race and explain why it was not as strong of a predictor of force as one might expect. The graph below demonstrates the positive, but not particularly strong, relationship between the non-white population of a town and its use of force rate.





*Note: To improve the readability of Scatterplot 3, six outlier municipalities (all with high use of force rates) were excluded from the graph. They are listed in the Appendix.*

## POLICY RECOMMENDATIONS

Police officers using force during arrests is not universally wrong, but the fact that this kind of violence is being distributed unevenly among New Jersey citizens warrants a change in policy. Using force more often in lower income areas or municipalities with higher proportions of non-white citizens is prejudicial and leaders in the state should step in to institute reforms that address this behavior. While there may be some justifications made about officers being quicker to use violence in areas with higher violent crime rates; the data shows that race, education, and income are significant predictors of use of force. The first thing New Jersey should do, if it is serious about dealing with improper use of force, is redesign the way that use of force data is collected and utilized by the state.

As previously mentioned, even though New Jersey has had a policy in place for nearly twenty years requiring officers to fill out a use of force form whenever they use force during an arrest, this data has not been used in any meaningful, public-facing, way by the State Police or local departments. Having a centralized data collection process would increase accountability for local officers immensely. Instead of having each police department keep track of its own use of force paperwork and brief the local prosecutor's office on these reports annually, the state should step in and maintain a database for all uses of force. This would allow the Attorney General greater oversight over the process and the research department of the Office of the Attorney General to analyze the information in real time. Allowing departments to collect and store their own force reports introduces needless opacity to the process and works against the spirit of the

statute mandating these reports be filed in the first place. In addition to centralizing the collection process, the state should publicly publish the use of force data collected at least bi-annually in order to increase departmental transparency, anonymizing the information if necessary, but providing citizens of New Jersey to know how often their local department is using force on suspects.

Beyond collecting and publishing data, the state should consider implementing a new process for officer review based on the information collected. On The Force Report website a graphic shows how many officers in each New Jersey police department would be flagged for review based on policies that other departments (in Los Angeles, New York City, and Chicago) follow. Instituting a similar internal flag-and-review system for officers involved in numerous use of force incidents would help increase public trust in police at a time when it is near its lowest (Jones, 2019). Designing a process that accounted for differences in the areas being policed would take time to perfect, but having such a system in place would be worth it. Having the analytic unit of the Office of Law Enforcement Professional Standards analyze the use of force reports and recommend officers using force at a higher rate than their coworkers to the investigative unit of the division for review would be a logical place to start. Creating a state-wide flag-and-review system like this would dramatically change the way officers decide to use force.

What this study has done is provide researchers and other interested stakeholders with granular data about police use of force in New Jersey. Beyond continuing to research the problem and flag officers involved in multiple use of force incidents for

review, the state of New Jersey should utilize this data to roll out custom made interventions for the police departments that have the biggest problems with force. Statewide, one-size-fits-all, responses will not solve the issues in local departments. Increasing the state mandated number of annual trainings for officers, for example, likely would not have a large impact on a department that consistently has issues around excessive use of force. Those officers are already completing annual trainings and probably would not see more trainings as something they need to take more seriously than any of their previous training classes. However, by identifying departments at the local level that do not fit into statewide trends for usage of force and working directly with them on the issue would likely have a larger impact on officers' behavior. No department, and no police chief, wants the state to single them out for special attention.

The Office of Law Enforcement Professional Standards could work alongside the Police Training Commission to provide these departments with training targeted towards correcting their patterns of excessive force. Training classes need not be the only intervention, but designing interventions to modify police behavior and approach is outside the scope of this study. What this study can do is assist in identifying departments that fall outside the norm when it comes to using force, and using force in relation to select demographic factors. Police departments in Newark, East Orange City, and Edison Township in particular stand out as having some of the highest rates of force in the state. When it comes to municipalities with high use of force rates as well as high populations of non-white citizens, Asbury Park, Camden, and Atlantic City are at the high end of the spectrum. Though they have low violent crime rates (under five per 1,000 citizens), Carteret, Sea Isle City, Glassboro, and Bloomfield Township all have use of force rates

over thirty eight per 1,000 citizens. Data of this kind could be used to tremendous effect, if the state of New Jersey chooses to do so.

While New Jersey does have plenty of work to do to address the way its police officers use force, the state has not been blind to its problem. Last year, Attorney General Grewal issued “five different directives targeting the use of force in arrests, internal affairs probes, evidence rules and police training” in an effort to increase transparency and accountability in the New Jersey police force (Nelson, 2019). Since funding grants to purchase body worn camera technologies from the federal government became available in 2015, hundreds of departments have utilized these oversight tools (Sullivan, 2017). The Office of the Attorney General has state standards for how these cameras can be used, ensuring that all officers equipped with cameras use them in the same way and that this sensitive data is properly stored (Hoffman, 2015). New Jersey’s police officers do complete annual trainings, although the topics they receive education in are left up to the discretion of supervisory officers. All of these policies should, in theory, make police officers better equipped to do their duties and more accountable to the public. New Jersey appears to be on the right path when it comes to addressing improper or discriminatory uses of force and implementing the recommendations made in this section would be a significant step forward.

## LIMITATIONS

As with all research, there are some issues that should be addressed concerning the validity of the research produced in this paper. These issues are primarily due to the availability of data, though certain time constraints did arise and limit minor aspects of the analysis. By far, the biggest limitation to this research paper is that the State Police of New Jersey did not provide detailed enough data to the Force Report in 2017. Because many municipalities are too small to warrant their own police departments, they are patrolled by the State Police. Though it is clear which eighty municipalities (Astudillo et al., 2018) are patrolled by the State Police, their use of force statistics in The Force Report were reported as a single number instead of being broken down by municipality. While there was a section on the reports filled out by officers indicating the location where the use of force took place, these were not always filled out with actual addresses (e.g. “outside the CITGO on rt 28”)(Astudillo et al., 2018). Not every report filled out by State Police officers had these kinds of errors, but the time it would have taken to place every address given in the eighty municipalities listed in the State Police’s 1,450 force reports (Astudillo et al., 2018) was not possible considering the timeline for this research. As such, in all three regional maps there are municipalities that do not have use of force statistics. While this is not ideal, there are still over 400 municipalities with that information, so the validity of the research is not in danger.

In addition to the incomplete data set, an imperfect measure was used to measure political partisanship. Created by the author for this research, the measure subtracted the total percentage of people registered as Republicans from the percentage of voters

registered as Democrats. This measure has not been tested for validity and only constitutes a rough measure of municipal politics in 2012. Partisanship could have been measured differently, using the Cook Partisan Voting Index (Wasserman and Flinn, 2017) for instance, but that would have required maps of New Jersey's congressional districts rather than its municipalities. One of the aims of this research is that readers should be able to easily compare variable maps and since all of the other maps made for this research used municipal level data, it seemed needlessly confusing to use different boundaries for the partisanship variable. The partisan lean variable is not perfect and could be refined for future research in this area.

Time constraints and the scope of this research also created some limitations for the results. Because this research was being done inside of a year by a single student, certain kinds of analysis would have simply taken too long to conduct. With use of force being such an important topic, there are innumerable variables that would be worth exploring to see if they impacted the way force is utilized by police officers. But the scope of this research project had to be relatively narrow to ensure that it would be completed within the given time frame. A municipality's type of local government, the race of officers compared to the suspects they use force on, the highest level of education attained by the officers of a department, whether the police department has a codified use of force policy that officers are trained on or not, the percent of a municipality's population that falls into the more 'criminally active' range of eighteen to thirty five (Sveri, 1962), and the income inequality (Gini coefficient) of a municipality would all be worth looking at in comparison to use of force rates. Areas for future research, other

variables to consider, and other techniques for data collection will continue in the following section.



## FUTURE RESEARCH

The topic of police use of force deserves attention and there are many ways in which researchers could continue to explore the topic that would add value to the current state of the literature. First, as addressed earlier in this paper, more analysis needs to be done on local police departments. The federal government does not collect data at the local level for these kinds of statistics, but some states and media outlets have stepped in to create localized data sources available for analysis. In the Policy Recommendations section, a centralized data collection and analysis process for New Jersey police departments was discussed. Municipal level data would lead to a much more robust understanding of how the majority of police departments are using force. The more detailed the data being collected is, the more interested parties can learn about police use of force. Understanding how officers outside of big cities behave when it comes to using force is important and would add immense depth to the current body of research. Researchers will never truly understand police violence if they only look at it from a bird's eye view. Collecting data on local police departments presents many challenges, but considering the increasingly loud calls for police accountability, advancing data collection in this area should be possible.

Second, there are more variables that could and should be tested to see if they have a relationship with police violence. Demographic factors like the gender of suspects involved in the use of force incident, the income inequality of the patrol area, the age of suspect and officer, and population density (or some other measure for comparing urban, suburban, and rural departments) all would provide useful information about how these interactions play out. Analyzing the different reasons an officer might be dispatched to a

scene would also provide a meaningful look at how officers perceive and react to suspects they come into contact with. If public order offenses like loitering led to more uses of force than enforcing laws related to drug or property crime that would not only be interesting to researchers but would help police departments assess their performance and respond to calls for service more appropriately in the future.

Outside of demographic factors, there are organizational variables worth conducting research on. Some examples would be officer education, the presence of body worn cameras, the gender makeup of police departments, hiring practices of departments, the presence of written use of force guidelines for officers, and the type of municipal government in the town (mayor-council, council-manager, or commission). Looking deeper at how municipal budgets are broken down and at police department budgets would also be enlightening. Research may find that departments with higher budgets are quicker to use force on suspects because they are less afraid of excessive force lawsuits from citizens due to having the means to fight them or that their budgets allow them to arm themselves more extensively, leading to a militaristic mindset (Delehanty et al., 2017). The opposite could also be the case, where departments with plenty of funding are found in municipalities with high average incomes and as a result (according to the findings in this study) police officers use force much less than their counterparts in less wealthy municipalities. Conducting analysis on more of these kinds of factors would both broaden and deepen current understanding of police use of force.

Understanding how police departments use force is important because there are gaps in the literature and this lack of understanding can result in injury and loss of life.

The more that police managers and elected officials know about how force is used against civilians and why, the more equipped they are to address the issue at hand. It is not enough to know that Black people are more at risk than White people are during a police stop, criminal justice researchers should be working to identify all of the factors that contribute to police violence. More knowledge on the subject will put departments, legislatures, and activists in a better position to advocate for change so officers can receive better training, be screened in different ways during the hiring process, or whatever intervention is necessary to ensure that officers are only using violence in situations that warrant it. Police are in the midst of a crisis of confidence right now, and addressing one of the most serious issues that civilians have with the force is one way to earn back that trust. More research on the subject will help to guide their decisions.

## CONCLUSION

Police officers hold a place in society that grants them immense power and responsibility. Most of the time, officers exercise this power with restraint and only resort to their ultimate authority, violence, in extreme cases. However, considering what The Force Report showed about how some departments in New Jersey used force more than others, a closer look at the data was warranted. Officers are human and as such, carry with them their implicit biases and notions about their fellow citizens. Using mapping and statistical analysis I sought to test if officer use of force rates could be predicted by civilian demographics, essentially asking if officer's preconceived ideas about who is dangerous could be explained by these factors.

The hypotheses for the analysis of the Force Report's data were based upon contemporary statistics showing that less wealthy and less white municipalities experience force at greater rates of force at the hands of police. After mapping and analyzing the data from the New Jersey Databook, the New Jersey Uniform Crime Reports, and the Force Report, the theory that civilian demographics influence police behavior appears to have significant support. Income and violent crime rate stood out as the most significant of the five factors tested while race had a surprisingly small impact on use of force incidents. Police use of force and accountability is a topic that will continue to occupy the public consciousness and scholars would be well served to continue researching the phenomenon.

This study does not intend to condemn police departments for using force or imply that all uses of force can be explained by the five independent variables that were

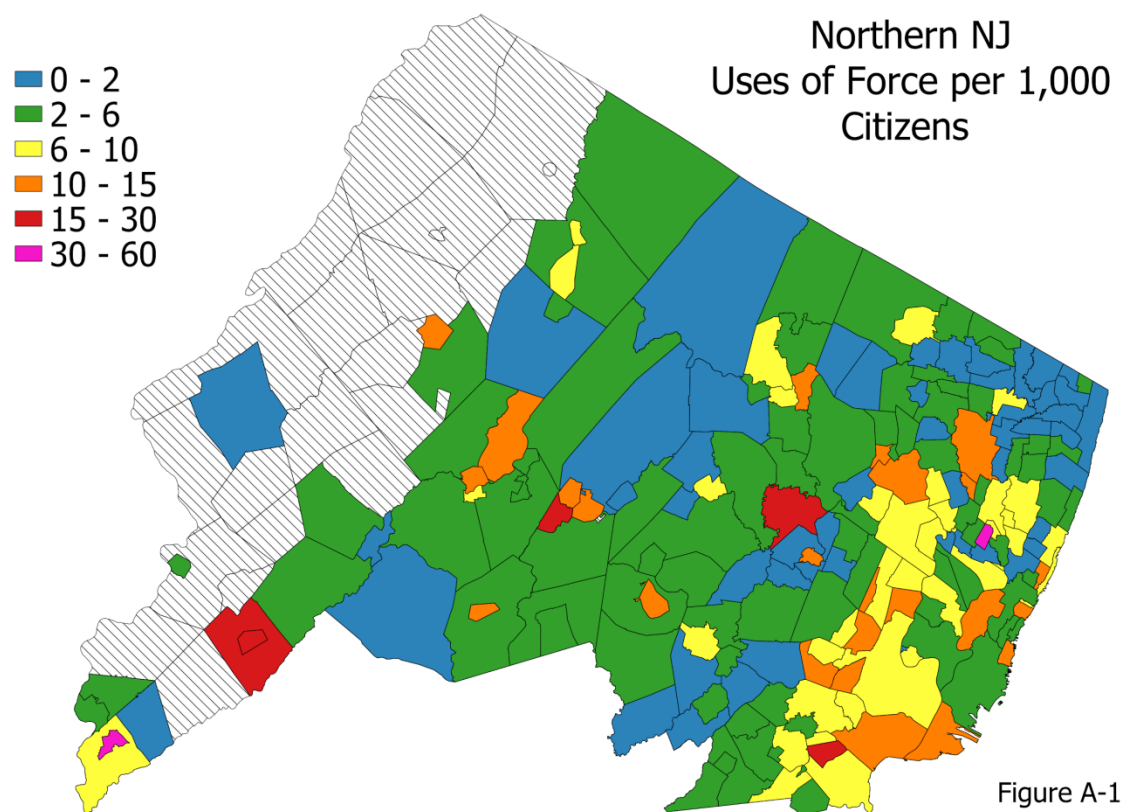
tested. The purpose of this research is to add to the current literature on the subject and provide police departments, lawmakers, and other interested parties with usable information about police use of force. Without understanding the magnitude of the issue at hand or prevalence of force incidents in these often overlooked small towns, no changes in policy or practice will occur. Effective policy is predicated on quality data collection and analysis. If New Jersey's police departments and Office of the Attorney General are serious about curbing improper use of force they should expand local data collection and work to turn this information into practicable policies. To ensure that police operate in a truly just way, leaders both inside and outside New Jersey police departments need to continue advocating for evidence based policies aimed at improving data collection and research, increasing transparency, improving training for officers, and holding officers to the very highest standards possible.

## APPENDIX

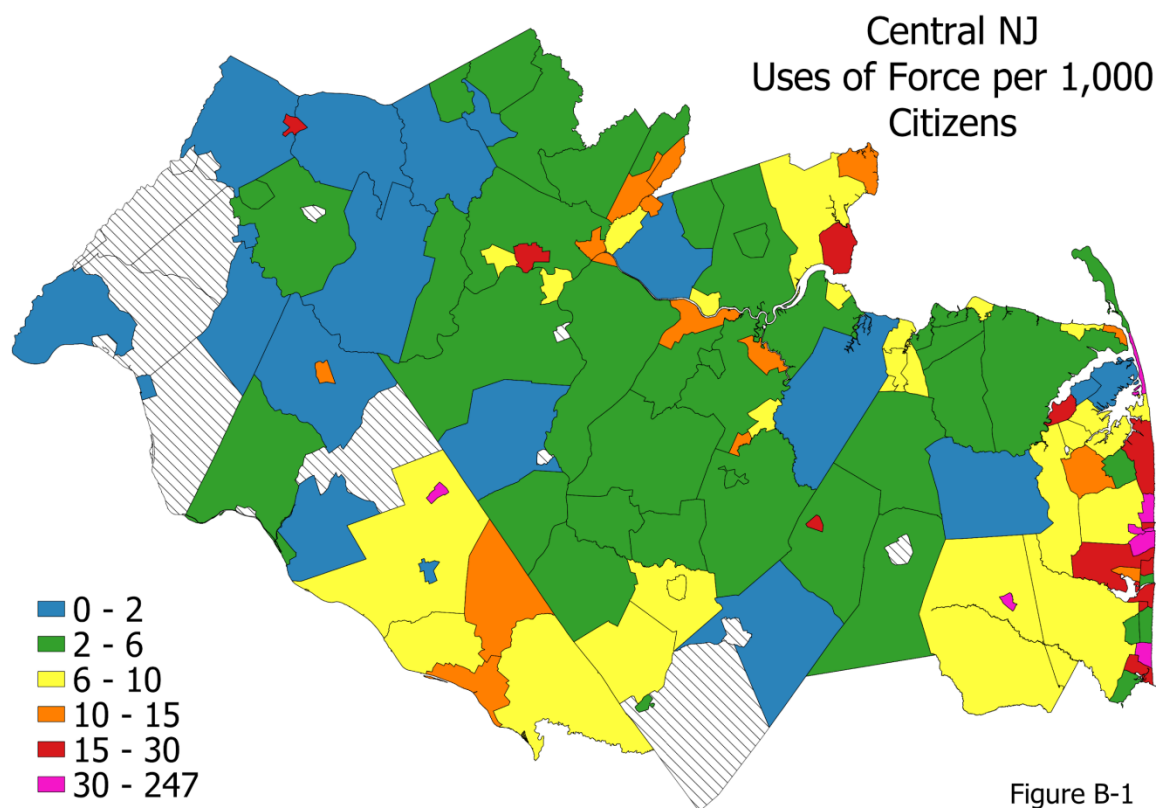
Table of outliers not pictured in scatterplots 1, 2, and 3:

<b>Outlier Municipalities</b>	<b>Use of Force Rate (per 1,000)</b>	<b>Income per Taxpayer</b>	<b>Violent Crime Rate (per 1,000)</b>
Cape May Point Borough	243.98		
East Orange City	332.22		
Newark City	415.33		
Edison Township	256.65		
Loch Arbour Village	247.42		
Tavistock Borough	3,200		
Alpine Borough		349.32	
Rockleigh Borough		210.72	
Saddle River Borough		374.22	
Millburn Township		199.53	
Harding Township		184.62	
Far Hills Borough		603.59	
Camden City			26

A-1: Northern NJ Use of Force Rate (per 1,000)

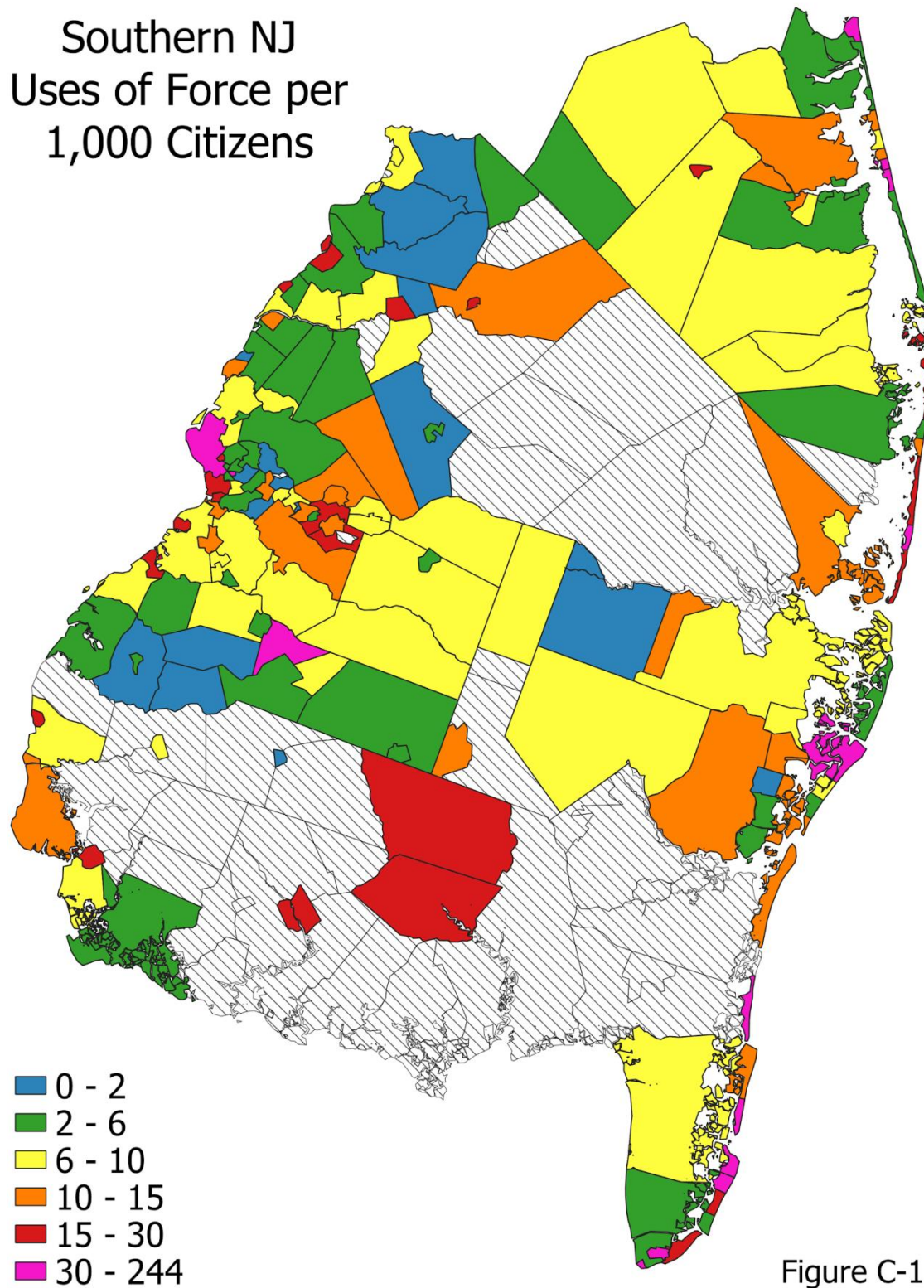


B-1: Central NJ Use of Force Rate (per 1,000)

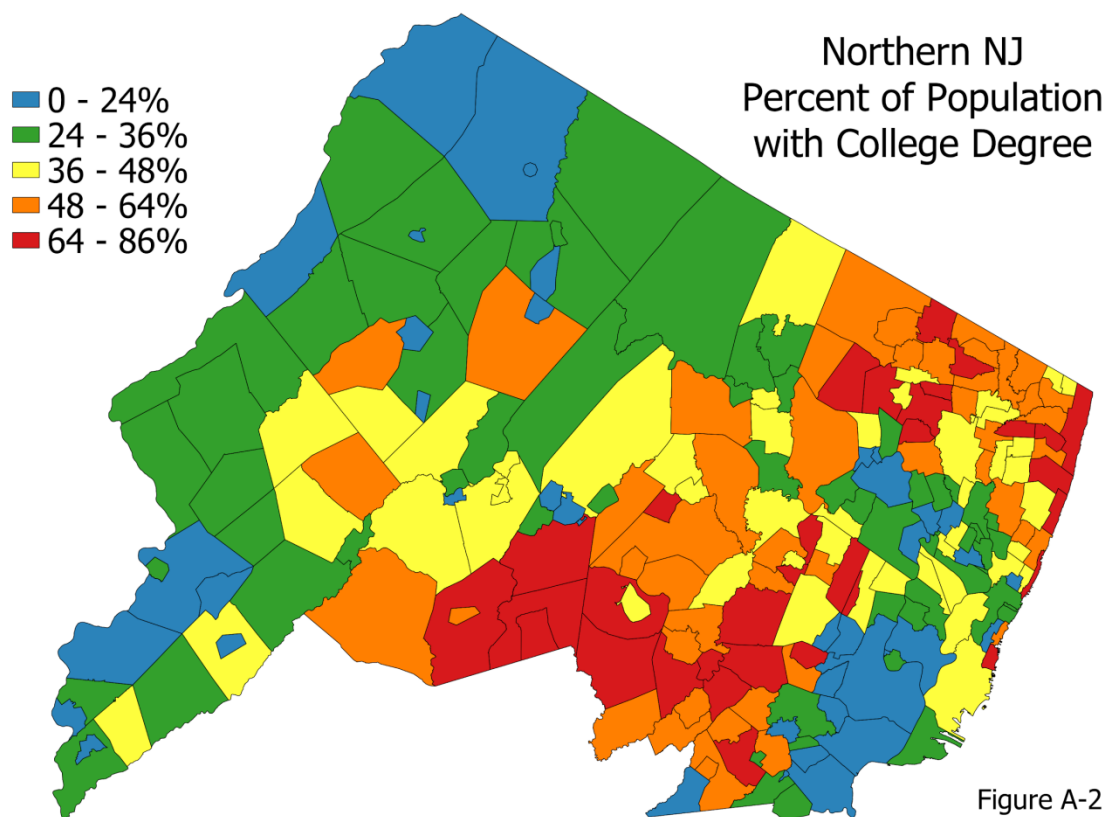




C-1: Southern NJ Use of Force Rate (per 1,000)



## A-2: Northern NJ % of College Graduates



## B-2: Central NJ % of College Graduates

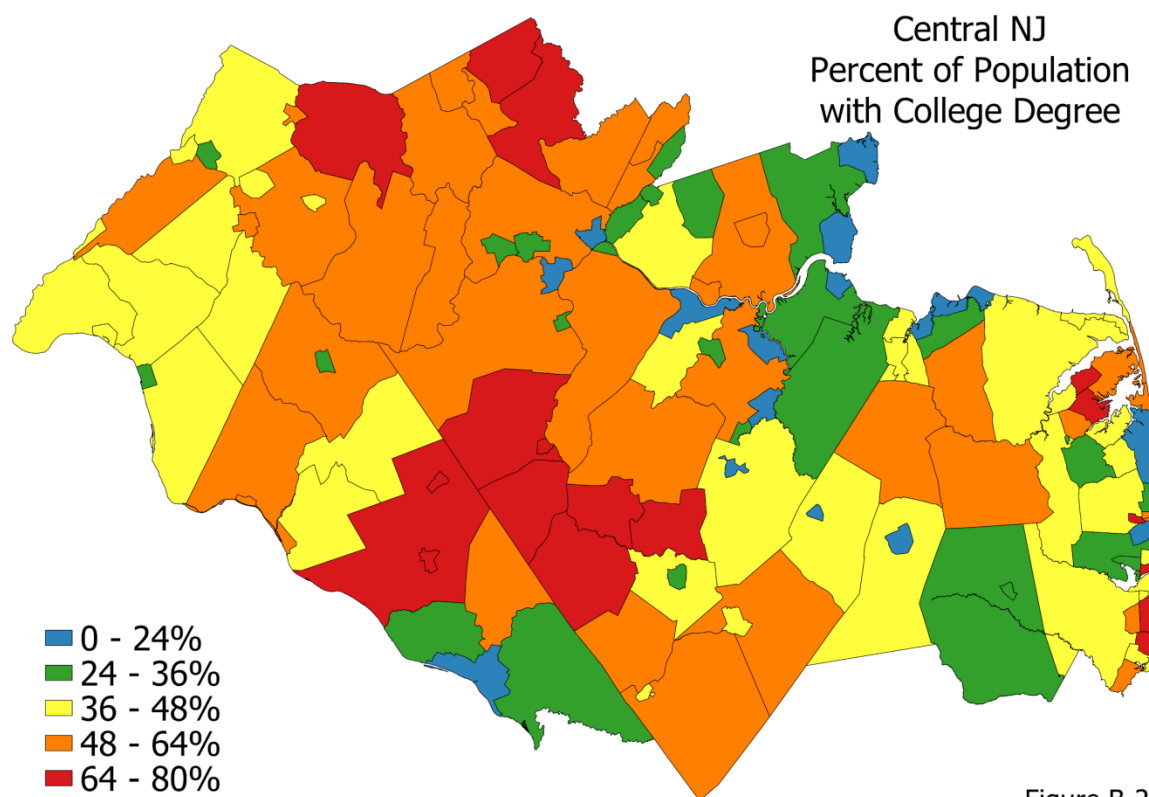


Figure B-2

C-2: Southern NJ % of College Graduates

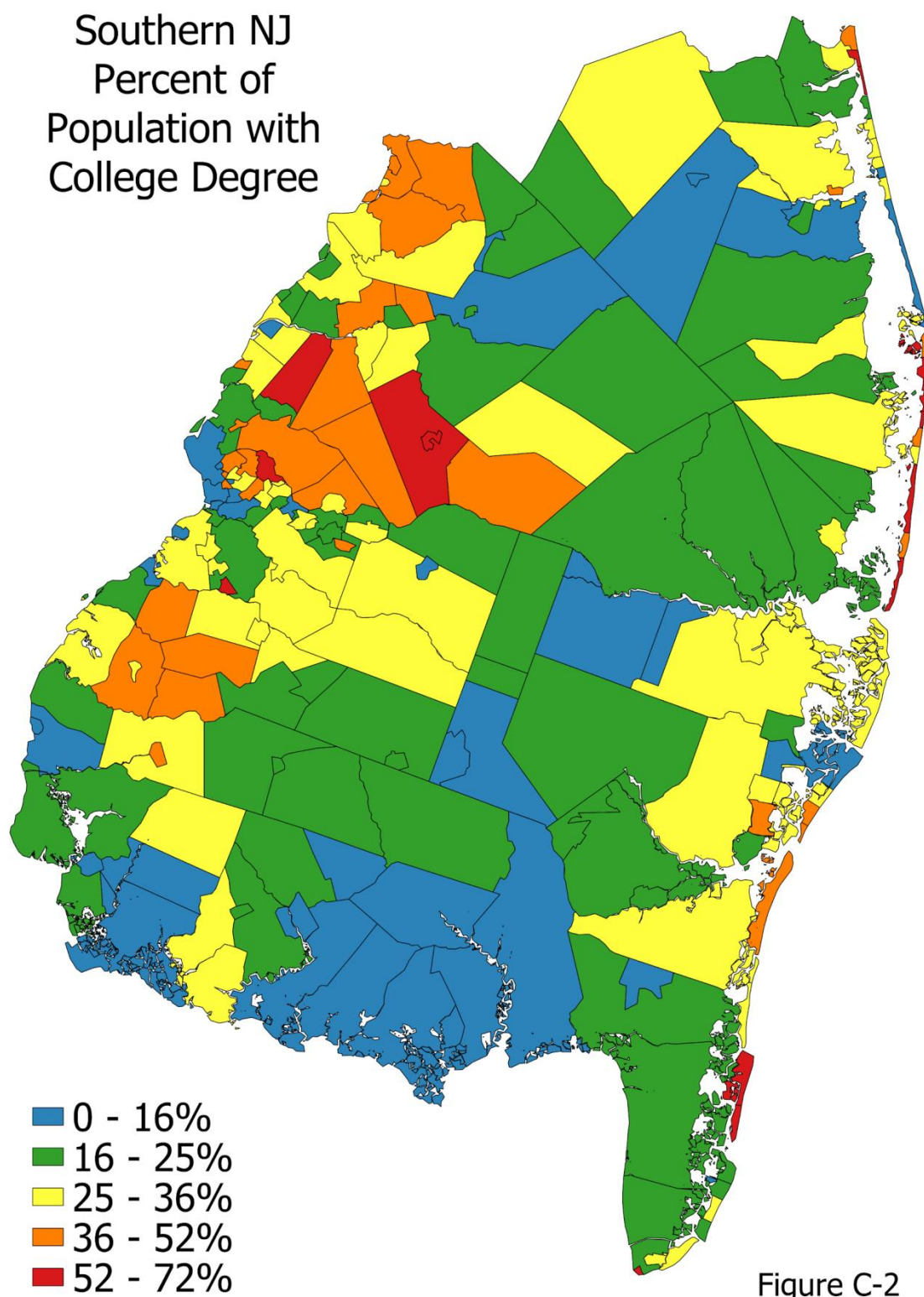
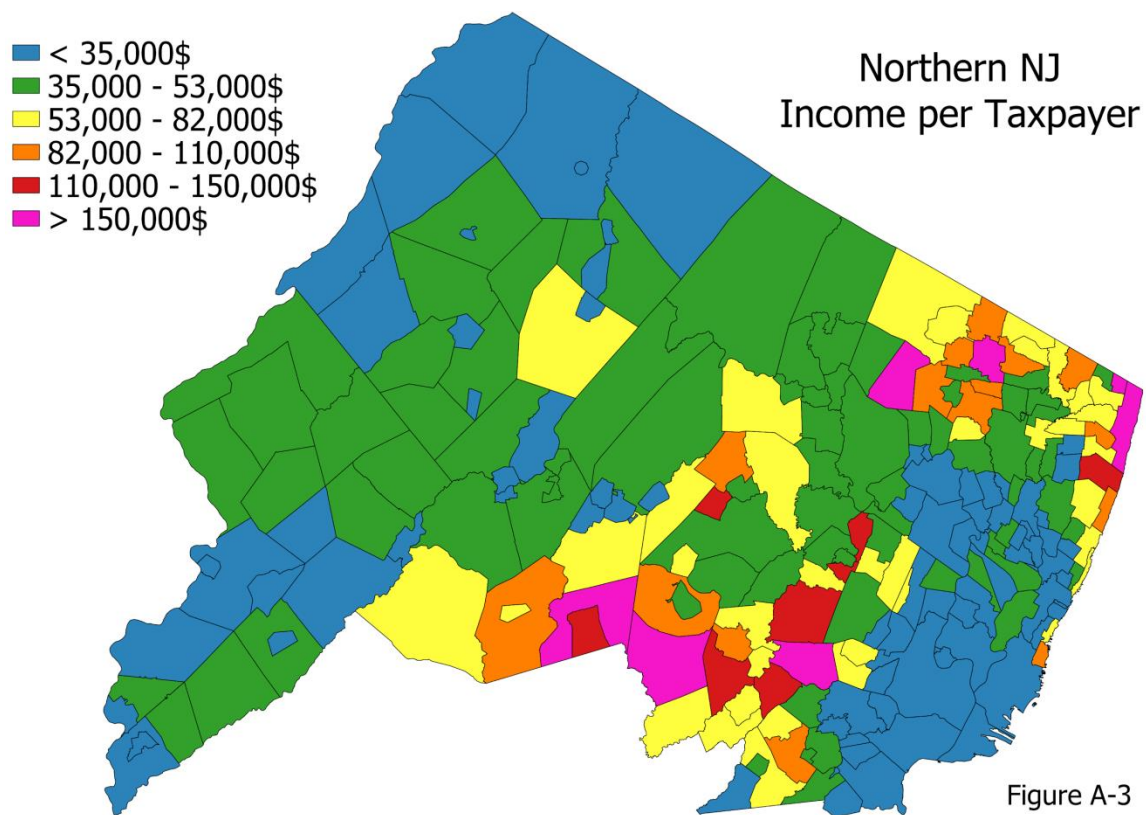


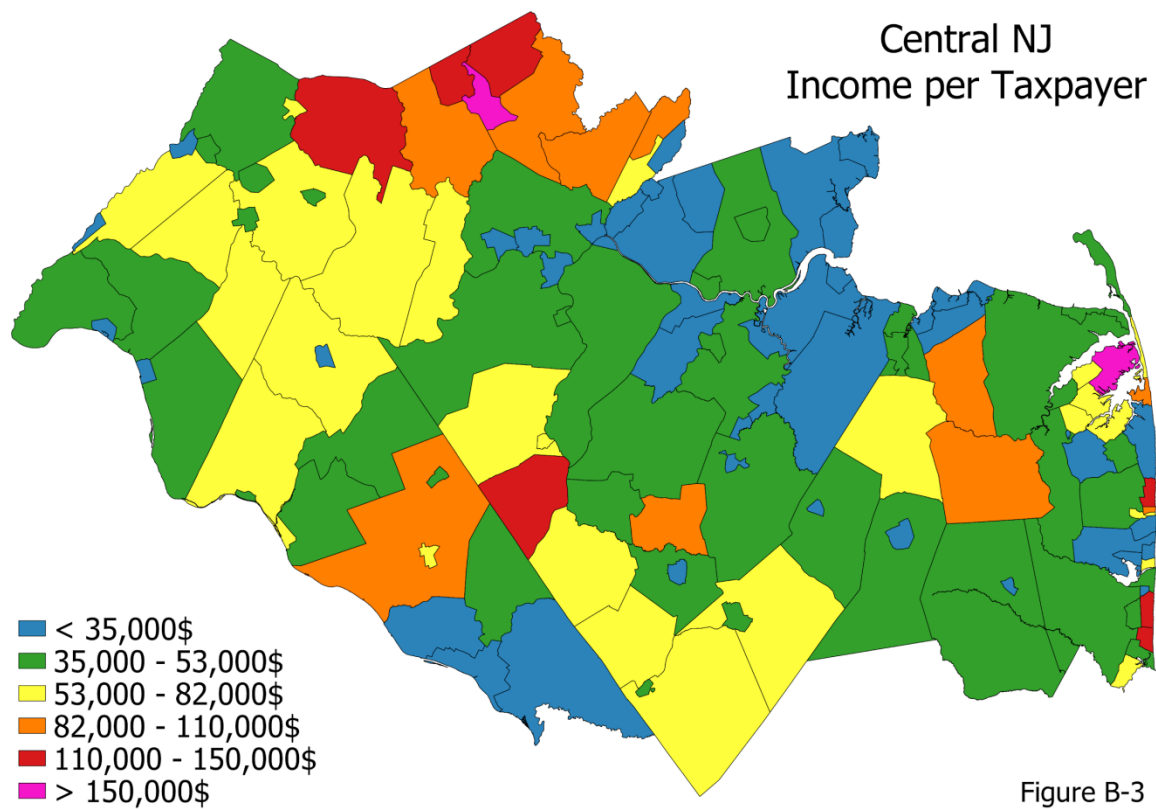
Figure C-2



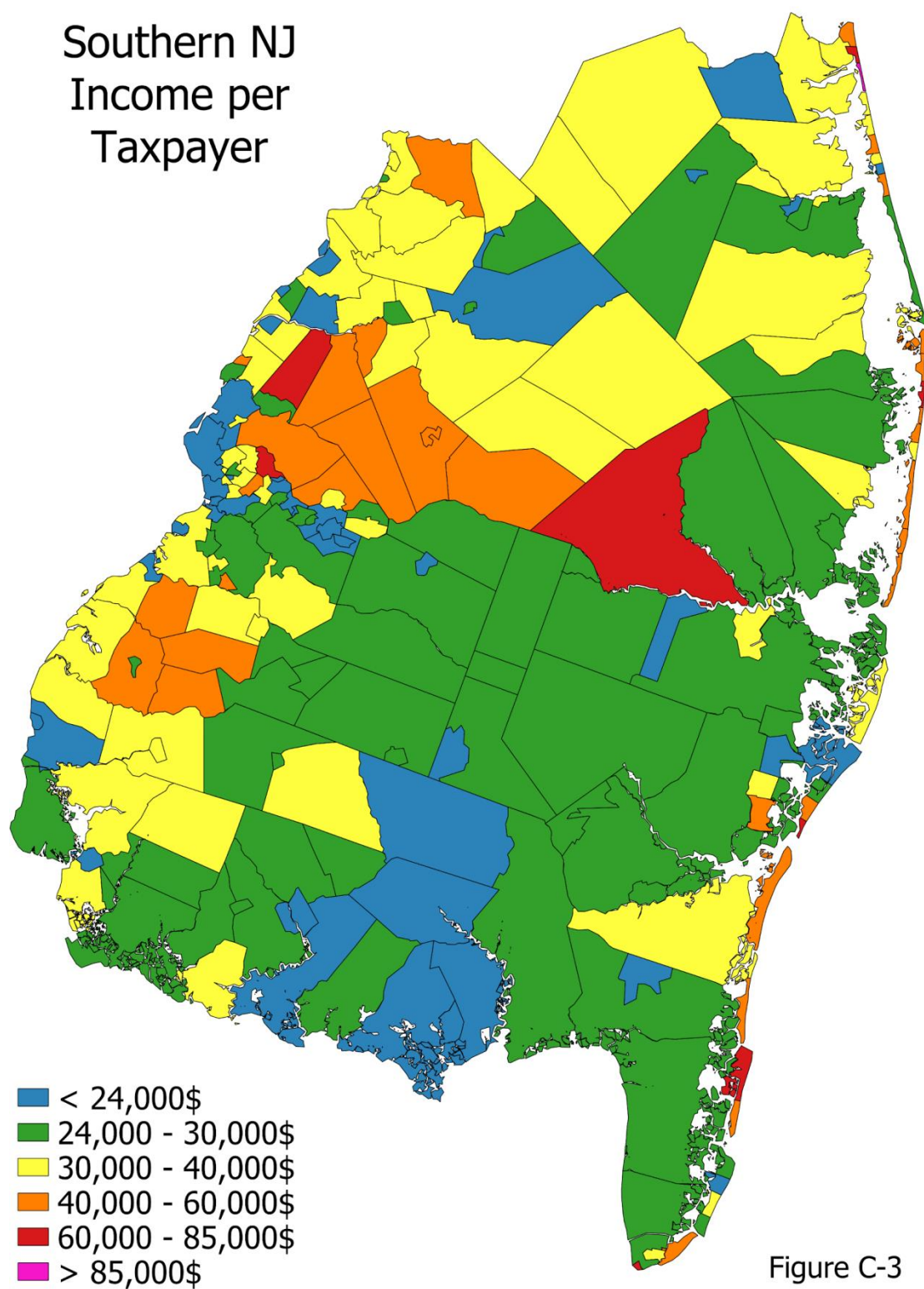
## A-3: Northern NJ Income per Taxpayer



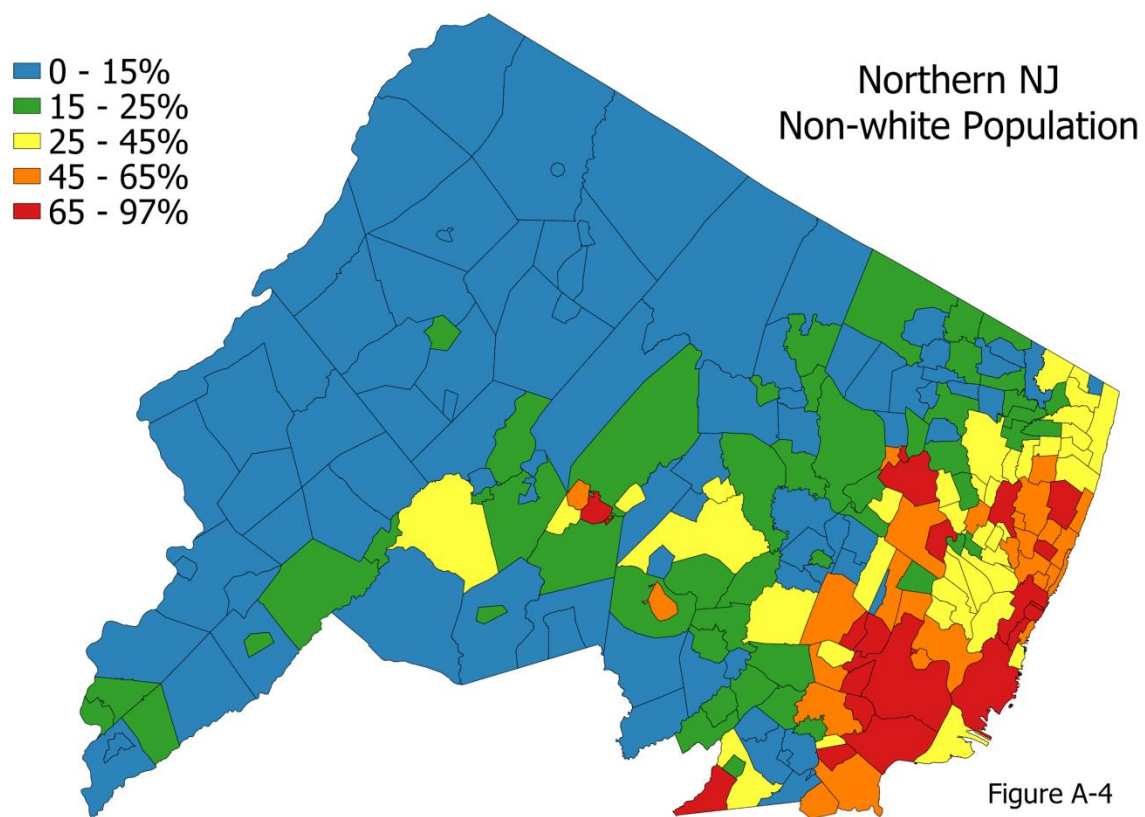
## B-3: Central NJ Income per Taxpayer



C-3: Southern NJ Income per Taxpayer

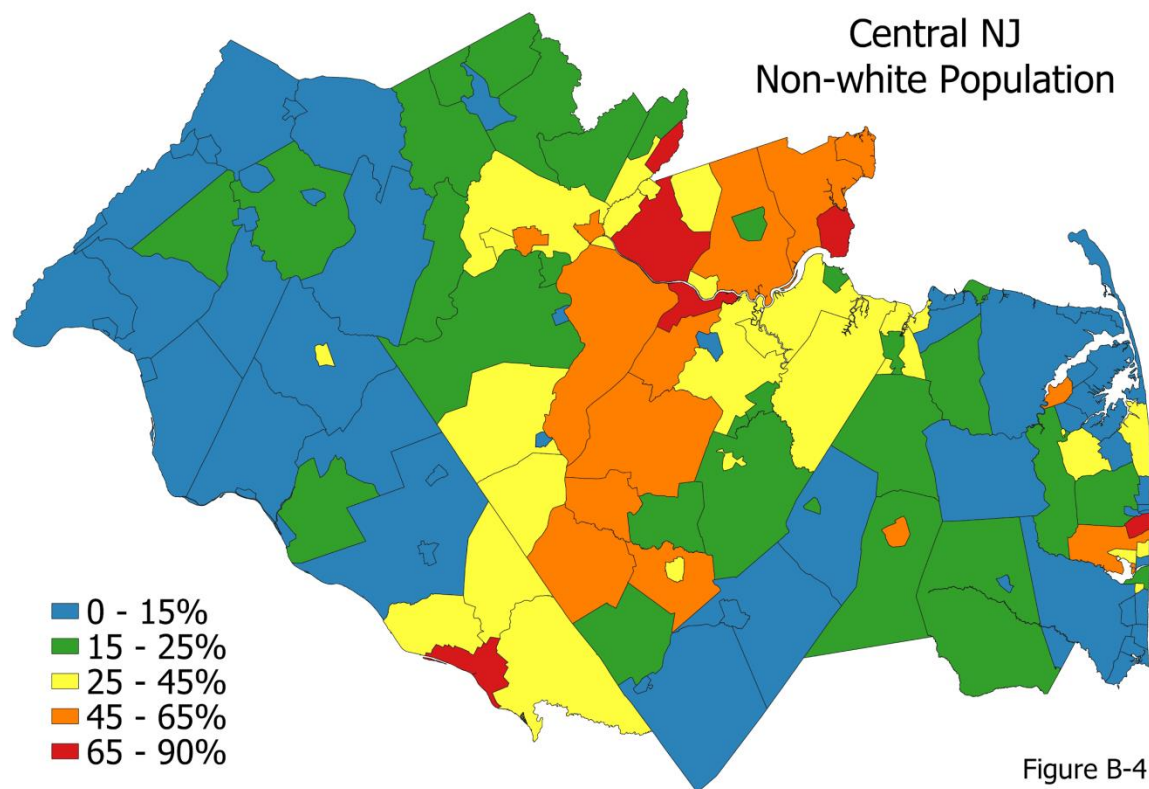


A-4: Northern NJ % of Population Identifying as Non-white

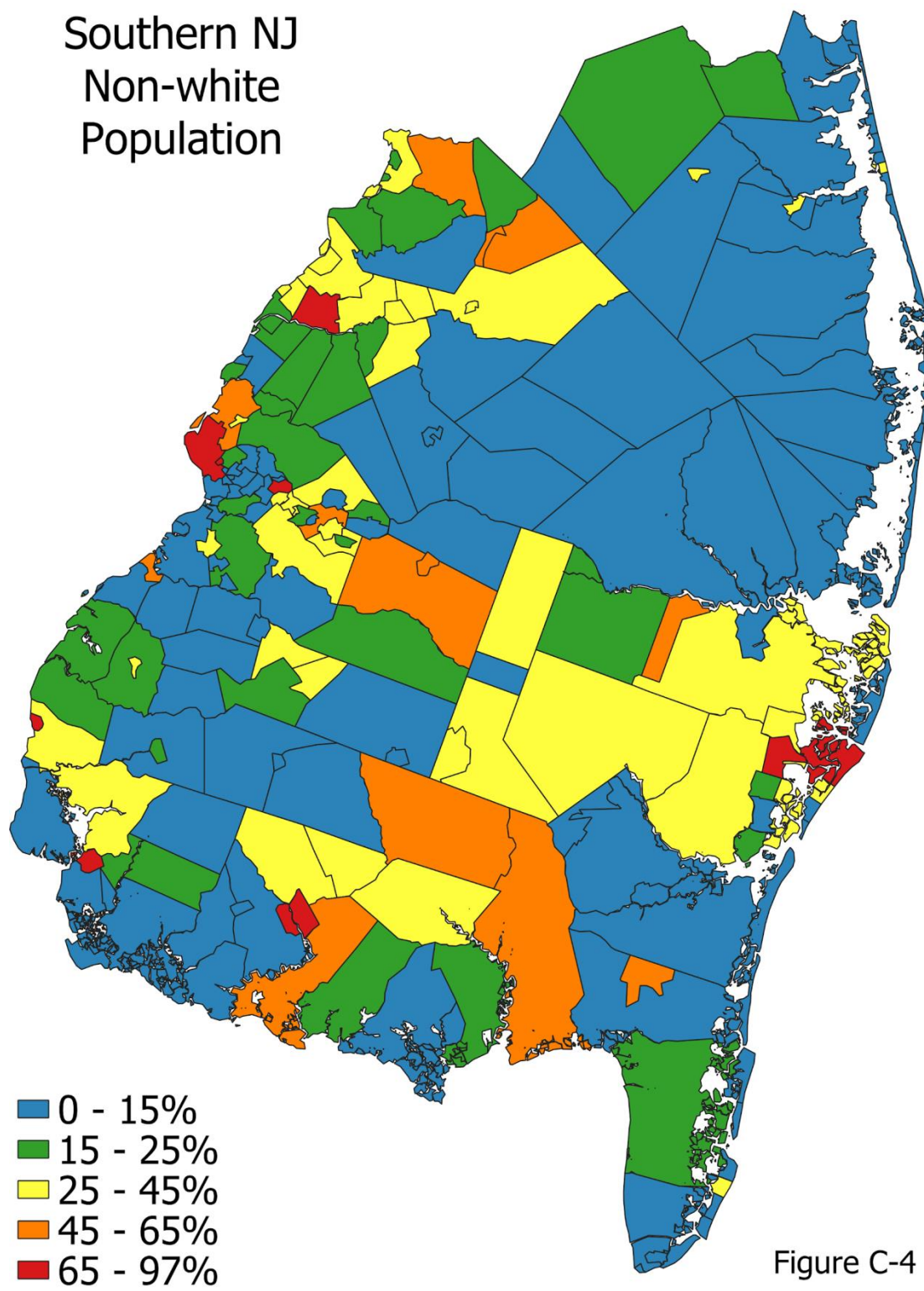




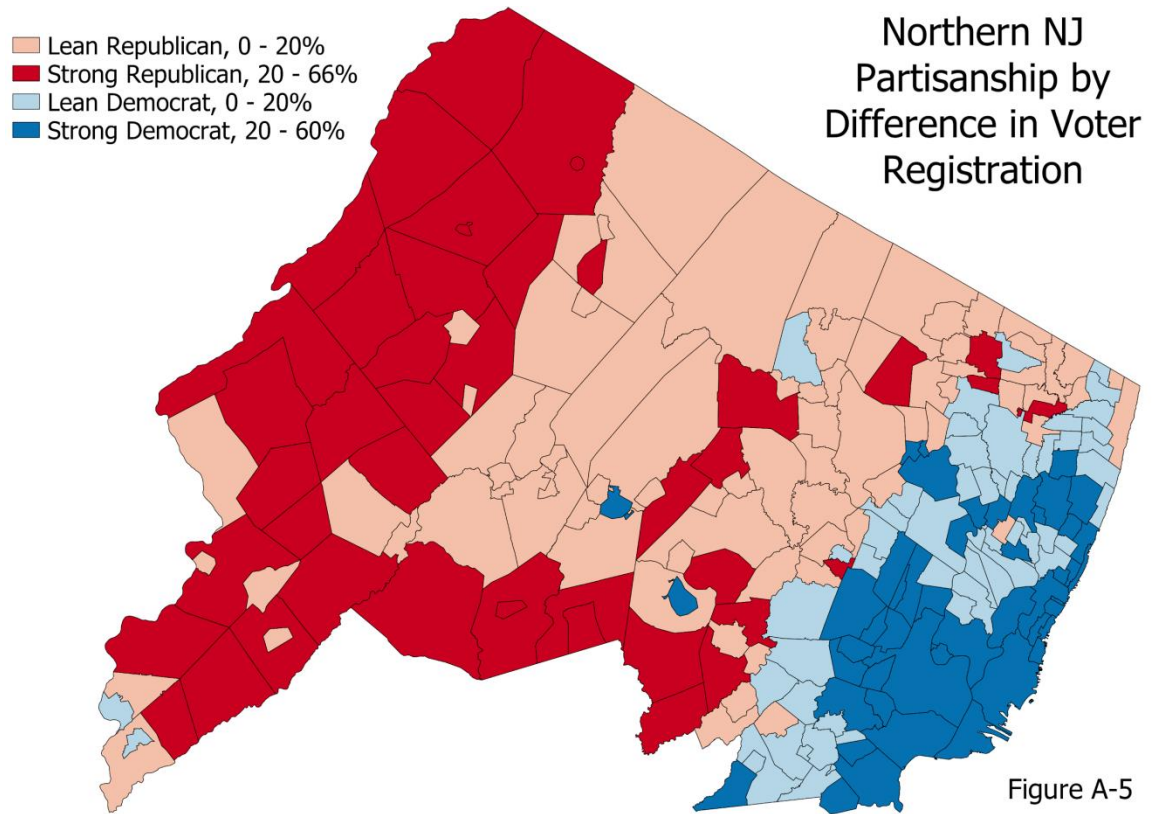
B-4: Central NJ % of Population Identifying as Non-white



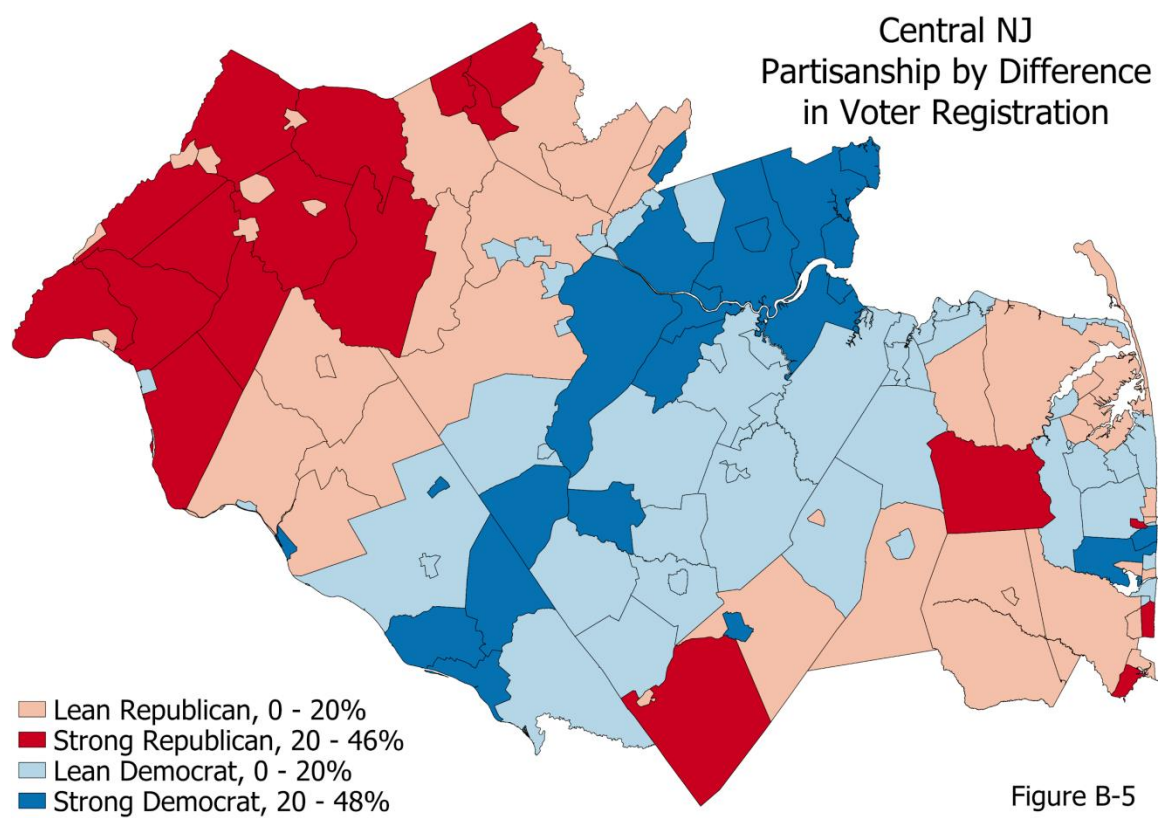
C-4: Southern NJ % of Population Identifying as Non-white



## A-5: Northern NJ Partisan Lean



## B-5: Central NJ Partisan Lean





## C-5: Southern NJ Partisan Lean

# Southern NJ Partisanship by Difference in Voter Registration

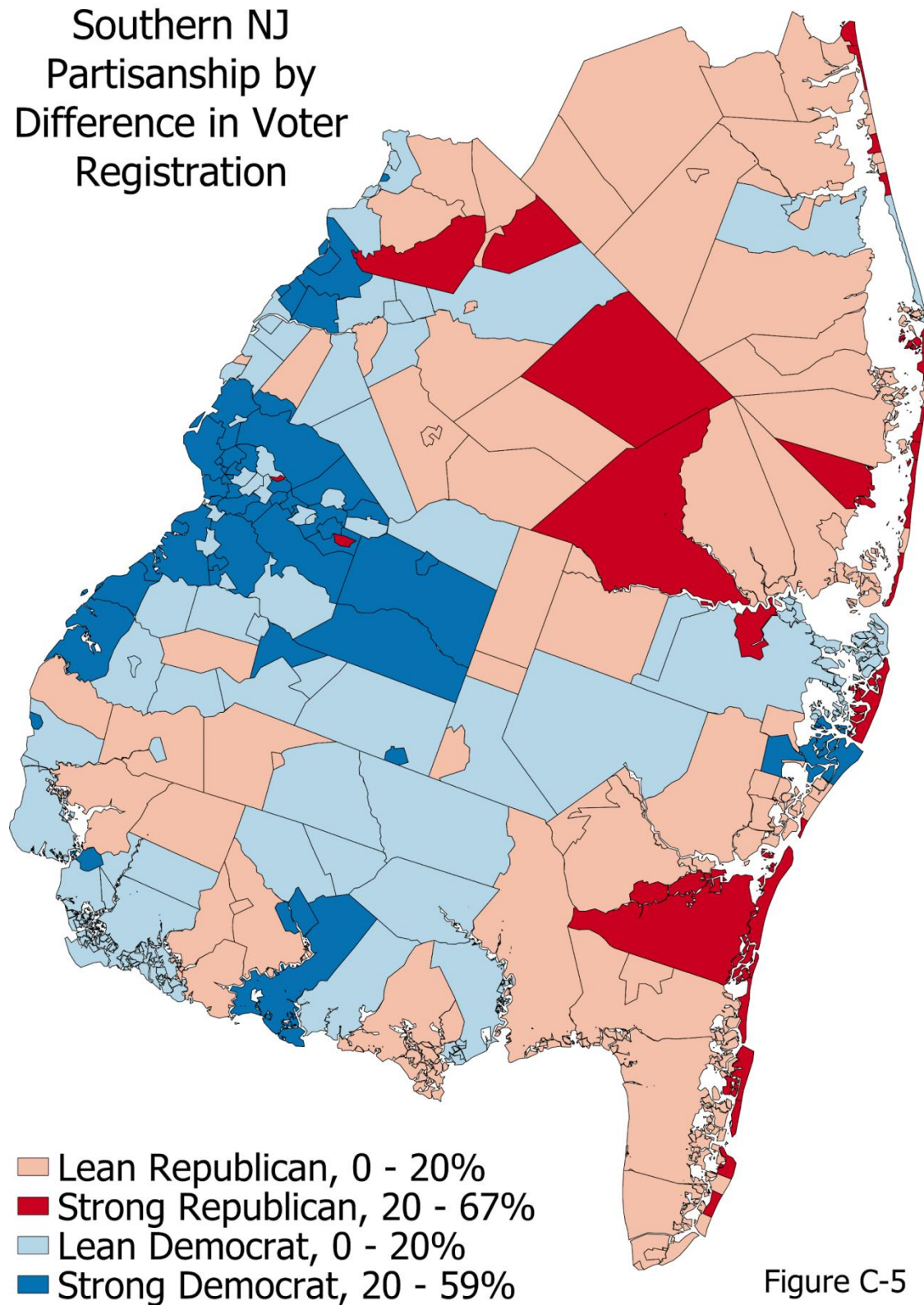
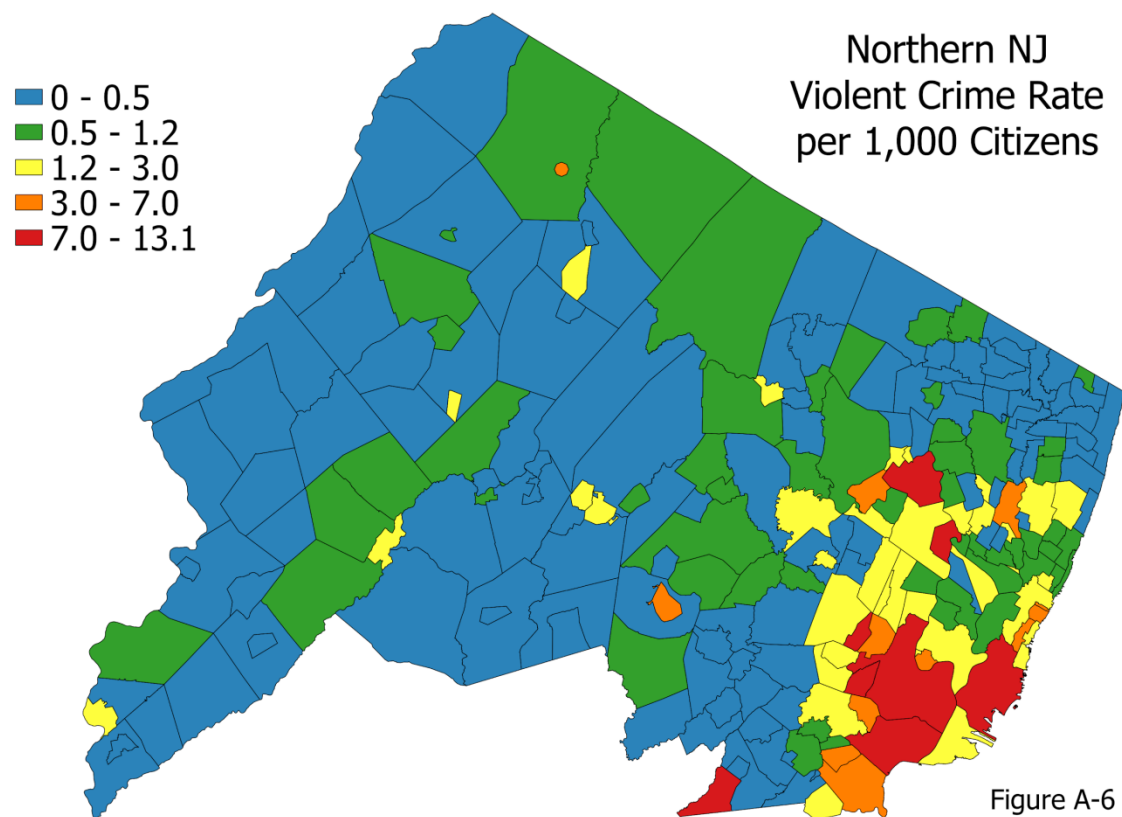
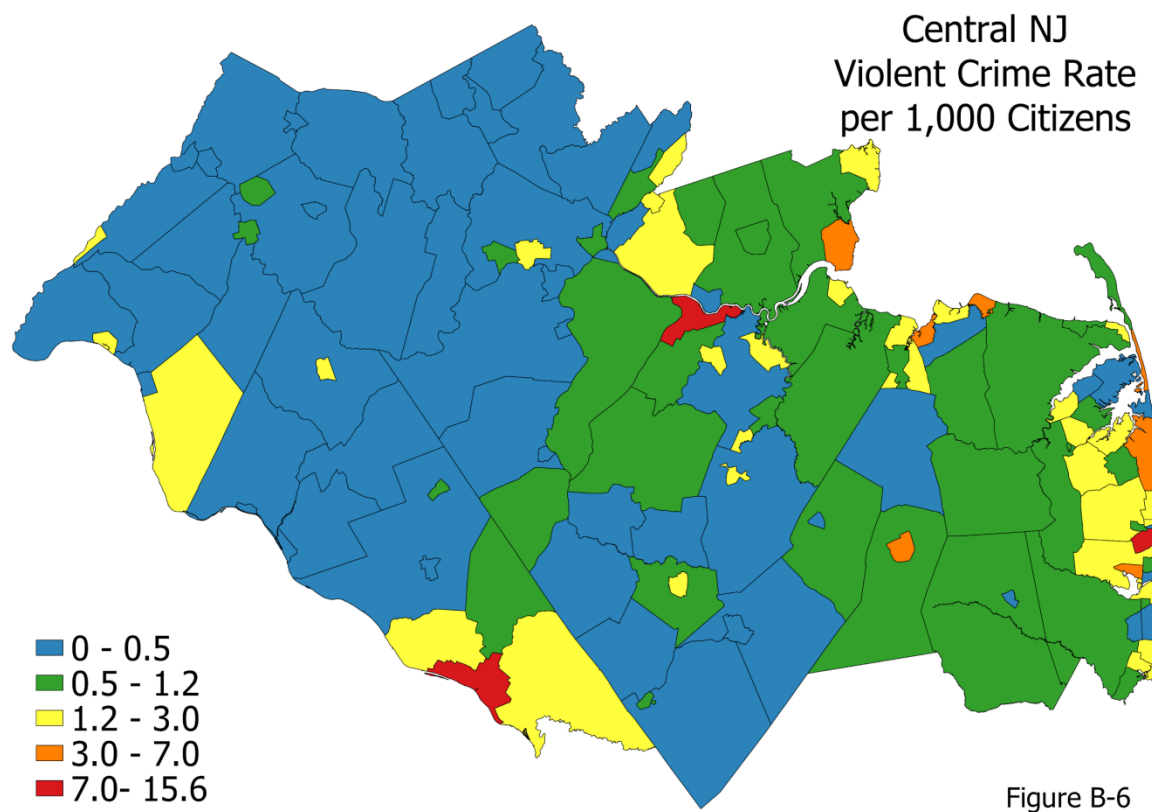


Figure C-5

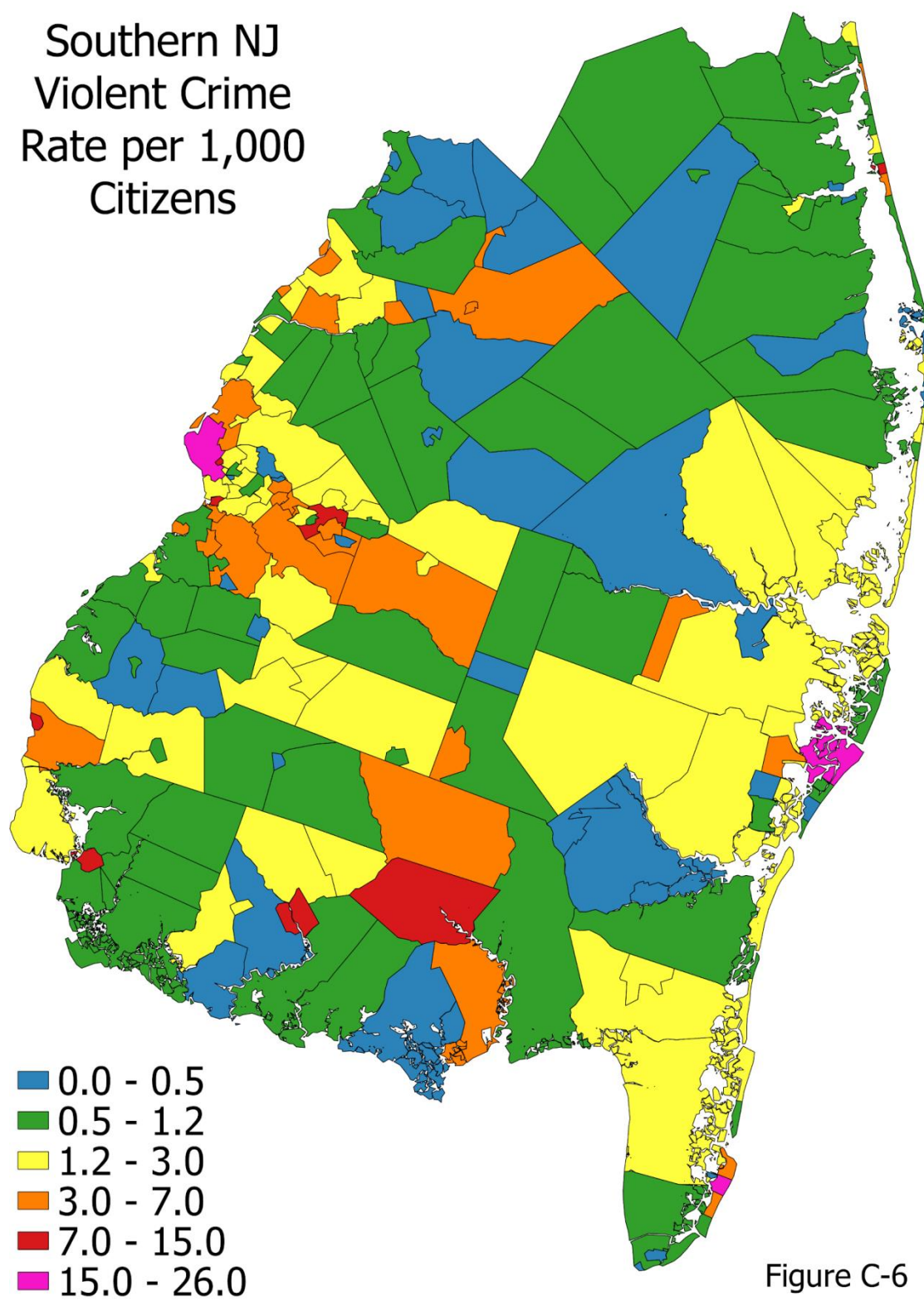
A-6: Northern NJ Violent Crime Rate



B-6: Central NJ Violent Crime Rate



### C-6: Southern NJ Violent Crime Rate





## BIBLIOGRAPHY

Arrest-Related Deaths Program Redesign Study, 2015-16: Preliminary Findings, Arrest-Related Deaths Program Redesign Study, 2015-16: Preliminary Findings (2016). Retrieved from [https://www.bjs.gov/content/pub/pdf/ardprs1516pf\\_sum.pdf](https://www.bjs.gov/content/pub/pdf/ardprs1516pf_sum.pdf)

Arthur, J., & Case, C. (1994). Race, class and support for police use of force. *Crime, Law and Social Change*, 21(2), 167–182. <https://doi.org/10.1007/BF01307910>

Astudillo, C. et al. (2018, November 29). The Force Report.

Bačák, V., Mausolf, J., Schwarz, C., & Bačák, V. (2019). How Comprehensive Are Media-Based Data on Police Officer-Involved Shootings? *Journal of Interpersonal Violence*, 886260519860897–886260519860897. <https://doi.org/10.1177/0886260519860897>

Banks, D., Hendrix, J., Hickman, M., & Kyckelhahn, T. National Sources of Law Enforcement Employment Data, National Sources of Law Enforcement Employment Data (2016). Retrieved from <https://www.bjs.gov/content/pub/pdf/nsleed.pdf>

Barrett, K., Haberfeld, M., & Walker, M. (2009). A comparative study of the attitudes of Urban, Suburban and Rural Police Officers in New Jersey regarding the use of force. *Crime, Law and Social Change*, 52(2), 159–179. <https://doi.org/10.1007/s10611-008-9179-4>

Boivin, R. (2017). Correlates of subject(ive) resistance in police use-of-force situations. *Policing: An International Journal of Police Strategies & Management*, 40(4), 719–732. <https://doi.org/10.1108/PIJPSM-06-2016-0081>

Black, D. (1976). *The behavior of law*. New York: Academic Press.

Burch, A. M. Arrest-Related Deaths, 2003-2009 - Statistical Tables, Arrest-Related Deaths, 2003-2009 - Statistical Tables (2011). Retrieved from <https://www.bjs.gov/content/pub/pdf/ard0309st.pdf>

Burghart, D. B. (2017). *Fatal Encounters*. Retrieved from <https://fatalencounters.org/>  
Chambliss, W., & Seidman, R. (1982). *Law, order, and power* (2nd ed.). Reading, Mass.;; Addison-Wesley Pub. Co.

Delehanty, C., Mewhirter, J., Welch, R., & Wilks, J. (2017). Militarization and police violence: The case of the 1033 program. *Research & Politics*, 4(2). <https://doi.org/10.1177/2053168017712885>

Department of Labor and Workforce Development: Regional - Focus. (n.d.). Retrieved from <https://www.nj.gov/labor/lpa/pub/regfocus-index.html>

Edwards, F., Lee, H., & Esposito, M. (2019). Risk of being killed by police use of force in the United States by age, race–ethnicity, and sex. *Proceedings of the National Academy of Sciences of the United States of America*, 113(34), 16793–16798. Retrieved from <https://doi.org/10.1073/pnas.1821204116>

Gambardello, J. A. (2019, December 10). Central Jersey does exist, says Gov. Phil Murphy (again). Retrieved from <https://www.inquirer.com/news/new-jersey/central-jersey-govenor-phil-murphy-eagles-giants-20191210.html>

Gray, A., & Parker, K. (2019). Race, Structural Predictors, and Police Shootings: Are There Differences Across Official and “Unofficial” Accounts of Lethal Force? *Crime and Delinquency*, 65(1), 26–45. <https://doi.org/10.1177/0011128718788044>

Hoffman, J. J. Attorney General Law Enforcement Directive No. 2015-1, Attorney General Law Enforcement Directive No. 2015-1 (2015). Retrieved from [https://nj.gov/oag/newsreleases15/AG-Directive\\_Body-Cams.pdf](https://nj.gov/oag/newsreleases15/AG-Directive_Body-Cams.pdf)

Hughey, M. (2015). The Five I’s of Five-O: Racial Ideologies, Institutions, Interests, Identities, and Interactions of Police Violence. *Critical Sociology*, 41(6), 857–871. <https://doi.org/10.1177/0896920515589724>

Hyland, S., Langton, L., & Davis, E. Police Use of Nonfatal Force, 2002–11, Police Use of Nonfatal Force, 2002–11 (2015). Retrieved from <https://www.bjs.gov/content/pub/pdf/punf0211.pdf>

Jones, J. M. (2015, June 19). In U.S., Confidence in Police Lowest in 22 Years. Retrieved from <https://news.gallup.com/poll/183704/confidence-police-lowest-years.aspx>

Klukkert, A., Ohlemacher, T., & Feltes, T. (2009). Torn between two targets: German police officers talk about the use of force. *Crime, Law and Social Change*, 52(2), 181–206. <https://doi.org/10.1007/s10611-008-9178-5>

Lind, D. (2017, December 29). How police officers became the culture-war heroes of the Trump era. Retrieved from <https://www.vox.com/policy-and-politics/2017/12/29/16826152/trump-police-immigration-blue-lives-matter>

Markowitz, F., & Felson, R. (1998). Social demographic attitudes and violence. *Criminology*, 36(1), 117–138.

McCarthy, C., Sullivan, S. P., undefined, undefined, & undefined, undefined. (2018, November 29). For 17 years, N.J. had the chance to stop potentially dangerous cops. The state failed to do it. Retrieved from

[https://www.nj.com/news/2018/11/nj\\_broken\\_system\\_for\\_stopping\\_potentially\\_abusive\\_police\\_officers.html](https://www.nj.com/news/2018/11/nj_broken_system_for_stopping_potentially_abusive_police_officers.html)

McCarthy, C., & Stirling, S. (2018, November 29). How we built the most comprehensive statewide database of police force in the United States. Retrieved from [https://www.nj.com/news/2018/11/how\\_we\\_built\\_the\\_most\\_comprehensive\\_statewide\\_database\\_of\\_police\\_force\\_in\\_the\\_us.html](https://www.nj.com/news/2018/11/how_we_built_the_most_comprehensive_statewide_database_of_police_force_in_the_us.html)

Mock, B. (2019, August 7). What New Research Says About Race and Police Shootings. Retrieved from <https://www.citylab.com/equity/2019/08/police-officer-shootings-gun-violence-racial-bias-crime-data/595528/>

New Jersey Data Book. Rutgers Center for Government Services, New Brunswick, NJ. [njdatabook.rutgers.edu](http://njdatabook.rutgers.edu)

Nelson, B. (2019, December 4). NJ attorney general overhauls standards for police behavior, use of force guidelines. Retrieved from <https://www.policeone.com/law-enforcement-policies/articles/nj-attorney-general-overhauls-standards-for-police-behavior-use-of-force-guidelines-gGwdzur3PvSo7rKD/>

Nix, J., Campbell, B., Byers, E., & Alpert, G. (2017). A Bird's Eye View of Civilians Killed by Police in 2015. *Criminology & Public Policy*, 16(1), 309–340. <https://doi.org/10.1111/1745-9133.12269>

NJDEP Digital Data Downloads in ArcGIS Shape file format. (n.d.). Retrieved January 30, 2020, from <https://www.state.nj.us/dep/gis/stateshp.html>

Obasogie, O. K., & Newman, Z. (2017). Police Violence, Use of Force Policies, and Public Health. *American Journal of Law & Medicine*, 43(2-3), 279–295. doi: 10.1177/0098858817723665

Porrino, C. S. Attorney General Law Enforcement Directive No. 2016-5, Attorney General Law Enforcement Directive No. 2016-5 (2016). Retrieved from [https://www.nj.gov/lps/dcj/agguide/directives/2016-5\\_AG-Law-Enforcement.pdf](https://www.nj.gov/lps/dcj/agguide/directives/2016-5_AG-Law-Enforcement.pdf)

Pryor, C., Boman, J., Mowen, T., & Mccamman, M. (2019). A national study of sustained use of force complaints in law enforcement agencies. *Journal of Criminal Justice*, 64, 23–33. <https://doi.org/10.1016/j.jcrimjus.2019.101623>

Sullivan, S. P. (2017, January 12). 37 N.J. police departments getting new body cameras. Retrieved from [https://www.nj.com/politics/2017/01/37\\_nj\\_police\\_departments\\_getting\\_body\\_cameras\\_with.html](https://www.nj.com/politics/2017/01/37_nj_police_departments_getting_body_cameras_with.html)

Sveri, K. (1962). Criminality and Age. *Acta Sociologica*, 5(1), 76–86. <https://doi.org/10.1177/000169936200500108>

Tate, J., Jenkins, J., & Rich, S. (2018, January 2). Fatal Force: 2019 police shootings database. Retrieved March 15, 2020, from <https://www.washingtonpost.com/graphics/2019/national/police-shootings-2019/>

Taylor, M., & Mateyka, P. (2011). Community Influences on White Racial Attitudes: What Matters and Why? *The Sociological Quarterly*, 52(2), 220–243. <https://doi.org/10.1111/j.1533-8525.2011.01202.x>

Wasserman, D., & Flinn, A. (2017, April 7). Introducing the 2017 Cook Political Report Partisan Voter Index. Retrieved from <https://cookpolitical.com/introducing-2017-cook-political-report-partisan-voter-index>

Wilson, J. (1971). *Varieties of police behavior; the management of law and order in eight communities* (College ed.). New York: Atheneum.

Zhao, J., & Hassell, K. (2005). Policing Styles and Organizational Priorities: Retesting Wilson's Theory of Local Political Culture. *Police Quarterly*, 8(4), 411–430. <https://doi.org/10.1177/1098611104269078>