

2018

Explaining Variance in Crime Rates Among Florida Counties

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Explaining Variance in Crime Rates Among Florida Counties

by

Philip Di Spirito

A thesis submitted in partial fulfillment of the requirements for the Honors in Major Program in
Political Science

in the College of Sciences

and in the Burnett Honors College at the University of Central Florida Orlando, Florida

Spring Term, 2018

Thesis Chair: Dr. Aubrey Jewett

Abstract

What explains the variance in crime rates among Florida counties? Bivariate regression found that clearance rate had a statistically significant negative relationship with crime rate, and that the following variables had a statistically significant positive association with crime rate: law enforcement funding, population density, Hispanic population percent, the percent of males in the 18-39 range, and the percent of immigrants. It seems probable that law enforcement funding is actually dependent on crime rate rather than causing increases in crime rate: counties with higher crime rates likely spend more money on law enforcement to combat crime. To deal with significant multicollinearity, stepwise regression was used to determine which variables to include in the multivariate analysis. In this model, clearance rate had a statistically significant negative association with crime rate and the percent of males 18-39 and population density both had statistically significant positive relationships with crime rate.

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Introduction

According to the FBI Uniform Crime Report, Florida has one of the highest overall crime rates in the country of the past two decades. (MacManus, Jewett, Bonanza, Dye, 2015, 261). During the late 1980s and early 1990s, Floridian's ranked crime as, "the most important," issue in Florida public policy. (MacManus, Jewett, Bonanza, Dye, 2015, 261). Although the crime rate has fallen significantly since then, and concerns about crime in the public sphere have decreased, Florida continues to be significantly plagued by crime. It is hypothesized that many factors contribute to Florida's high crime rate, and crime rates across the United States. Some of the theories thought to be most relevant to Florida are: funding theories, class distinction theories, culture of poverty theories, demographic theories, climate theories, and tourism theories. The following literature review gives an overview of previous research that also helps to demonstrate and explain these theories.

Review of Criminality

In a report from the Brennan Center for Justice at NYU School of Law, “What caused the crime Decline?” the study finds that simply increasing the amount police officers on the job actually can reduce crime. (Roeder, Eisen, Bowling, 2015, 41). In the 1990s, as crime rates surged, as did incarcerations, the ranks of police officers around the country did as well. By 1999, the number of police officers in the United States rose 28%, from 698,892 to 899,118. (Roeder, Eisen, Bowling, 2015, 41). A major contributor to this rise in new police officer hires was the, “1994 Crime bill.” This 30-billion-dollar Congressional bill provided funding for law enforcement in localities around the nation to hire more police officers, as well as purchase new equipment and technology. (Roeder, Eisen, Bowling, 2015, 42). This study finds during the 1990s, as police employment increased dramatically, this increased police presence also brought down surging crime rates at the time, by about 5%. Several other studies have found similar results. In 2002, Levitt used data from 122 cities from 1975 to 1995, and found that increased police figures brought down violent crime 12% and property crime by 8% (Levitt, 2002, 1246). Other researchers Tomislav Kovandzic and John Sloan found in examining data from Florida in the 1980s and 1990s, that increasing police numbers led to fewer robberies, burglaries, and larcenies, as well as less crime overall. (Kovandzic, Sloan, 2002, 1). Another study by Marvell and Moody (1996), finds consistent evidence that increases in funding for the number of police officers in a department, causes a decrease in crime in the following year. Their analysis estimates that for every additional police officer hired in a large metropolitan area, 24 serious crimes are prevented. As for officers hired statewide, however, only 4 serious crimes per officer will be prevented. However, as years go by, this number becomes significant in the amount of

major crimes that are deterred, overall (Marvell and Moody, 1996, 632). Additionally, a study done by the Florida Department of Law enforcement finds that, “increases in public safety funding, leads to decreases in crime rates.” (FDLE, 2017). In 2017, the Florida Department of Law Enforcement announced that Florida’s crime rate hit a 46-year low (FDLE, 2017). In 2016, there were 18,146 fewer crimes than in 2015, a 2.8% decrease. Since 2015, the crime rate has dropped 4.4% altogether. (FDLE, 2017) The Florida Department of Law Enforcement attributes this drop-in crime to the 4.9 billion dollar increase in public safety funding in Florida’s, “Fighting for the future budget.” (FDLE, 2017). This investment included pay increases for law enforcement personnel and correctional officers, as well as funding to reduce recidivism rates and increase crime prevention programs (FDLE, 2017). FDLE’s study concludes that increases in technology, sworn officers, and prevention programs are what led to statewide decreases in crime. (FDLE, 2017). However, studies attributing declining crime rates to law enforcement funding are not without dispute. A study done by Political Scientist Christopher Sullivan at Louisiana State University 2016 found that as the NYPD decreased patrols in 2016, civilian complaints of major crimes- murder, rape, felony assault, burglary, and grand larceny, decreased as well. (Sullivan, O’Keefe, 2016). Sullivan also found that there was no reason to suspect that the reduction in foot patrols would prevent citizens from registering complaints with NYPD through 911 or their local precinct, given the severity of these types of crimes. (Sullivan, O’Keefe, 2016).

All of these results seem to combine to confirm the hypothesis that law enforcement funding does effect crime rate. When one considers the sharp rise in police officer hires, and purchasing of new technology side by side with a declining crime rate in most of these studies, it

is clear that increased law enforcement funding can effectively can lower the crime rate.

However, some of the issues with these studies include non-random assignment and also small study groups. But, these studies are the best evidence available about the effect of increases in police numbers and technology through funding.

In addition to funding, another way that the criminal justice system may impact crime rate is by the level of its clearance rate. Jurisdictions that make arrests and bring charges in a higher percent of cases may reduce criminal behavior, while those with lower clearance rates may see higher crime as a result. Entorf (2008) finds that in German states between 1977 and 2001 crime was significantly deterred by higher clearance rates.

In a report done by Aimee Mckim at Creighton University, Mckim argues that the social standing of a complainant is extremely important in determining if a crime is reported, and furthermore, if this complaint is taken seriously by the police. (Mckim, 2006, 2). White collar status has an apparent impact on the number of crime reports actually filed. That is, that blue collar workers both report fewer crimes to police in the first place, and are less likely to have their reports taken seriously or lead to any police action than their white -collar counterparts. (Mckim, 2006, 2). The Class distinctions theory asserts that patterns of police behavior directly affect crime rate because of the likelihood of police to take action or report a crime when dealing with different socioeconomic classes of people.

While this could certainly be true, this is a difficult theory to prove or disprove with any sort of data. One way to empirically validate these findings could be to look at what socioeconomic areas in the State of Florida report the most crime that shows up on the UCR.

Another theory of explaining variance in crime rate is the culture of poverty theory. Throughout the United States, there are numerous metropolitan impoverished areas. Some political scientists have suggested that a concentration of the poor in, “ghetto,” areas promotes a culture of poverty, which in turn leads to a higher incidence of crime.” (Mckim, 2006, 3).

Wodnicki explains this by tying opportunity in impoverished areas to crime rates. As jobs and other businesses have moved out to the suburbs in recent years, those left in the metropolitan areas have been left with scarce options for work. Thus, those individuals who were left behind became desperate and resorted to crime to solve their problems, salvaging whatever they could to survive (Wodnicki, 1999, 3). Essentially this means that poor metropolitan areas actually generate a higher likelihood of crime. Overall, this means that in areas with more impoverished areas, one can expect to see a higher crime rate.

When discussing county by county crime rates, it will be important to see what landmark or major cities are within the county borders, as according to this data, cities tend to be important indicators of criminal activity.

Another factor in explaining crime variance is demographics. South and Messner argue that, “three individual demographic correlates of crime are: age, sex, and race.” (South, Messner, 2000, 84). These factors make individuals more or less likely to commit crimes. Traditionally, the most likely offenders are in the, “18-35 age group, male, and a member of a racial minority such as black, or Hispanic.” (South, Messner, 2000, 84). Other demographic indicators of crime include poverty rate, and population growth. According to Brady and Burton, “there is consistent evidence from multiple national settings that individuals with low income, occupational status,

and education have higher rates of criminal offending.” (Burton, Brady, 2016, 625). “Empirical studies have found that the crime rate among the poor to be from twice to twenty times the rate for the middle class. (Braithwaite, 1975, 60). These Individual characteristics, combined with a deteriorated social structure in urban areas, appear to lead to higher crime rates across the board. Another demographic factor is population growth. Braithwaite argues that, “population increase results in an increase in the rate of residential mobility.” (Braithwaite, 1975, 60). As cities grow, poor inner-city residents are pushed further from the center of the city, where business has taken the place of these inhabitants. This in turn causes these poor inhabitants to move away from the center of the city, into areas that were formerly, “middle class.” This causes the middle-class residents to move even further into the suburbs. (Braithwaite, 1975, 60). These booms in population growth not only displace groups of people, but in displacing them strip them of adequate provisions of amenities, and work. In losing these things, people may turn to crime as a way of life to satisfy both social and monetary needs after displacement by population growth.

Empirically, looking at unemployment rates, poverty levels, welfare recipients, and percentages of racial minorities, county by county, may be a sufficient way explain crime in some areas of Florida. Florida at times has also experienced influxes of population growth. In examining these influxes, a relationship may be found between population growth and crime rate in various cities and counties throughout the state.

Another theory of crime that is particularly of interest when discussing Florida’s crime rate is weather. Researchers have proposed a few different hypotheses on why weather effects crime. Ranson explains that weather factors into the, “rational consideration of the costs and benefits of crime.” (Ranson, 2012, 3). According to Ranson, weather conditions affect the

probability that a crime will be successfully completed. Nights where there are more individuals out because the weather is more mild, may increase the opportunity for offenders to successfully target some of these individuals. In a large study done by Jacob, Lefgren, and Moretti, they find that, “rates of violent crime and property crime are elevated during weeks with hot weather.” (Jacob, Lefgren, Moretti, 2007, 2). It is hypothesized that warmer weather provides both more opportunity to target victims, as well as provide hassle-free getaways from where crime was committed.

Overall, climate theories seem to point to the fact that warmer weather facilitates more crime. The fact that Florida has warm weather the majority of the year likely contributes to its higher crime rate compared to a number of northern states where inclement weather impedes criminal activity for part of the year. However, there is not enough variance in the weather within Florida to study its effect on crime at the county level.

The final factor in explaining crime variance is one that is perhaps most unique to Florida, tourism. Researcher Chris Ryan finds that there is a relationship between tourism and crime. Ryan explains there are likely a few reasons that tourism and crime are connected. The first of these theories is that, “a venue is used by criminal because of the nature of the tourist location, but the victims are not specifically tourists.” (Ryan, 174). An example of this would be criminals targeting a shopping mall in a tourist district. While the patrons of such a mall may be residents or tourists, criminals target it specifically because of the high volume traffic, and the opportunities that it represents, regardless of the victim being a tourist or not. Another theory is that, “a location attracts criminal activity because tourists are easy victims.” (Ryan, 2002, 175).

Tourists are often unfamiliar with the areas they are in, and international tourists may be unfamiliar with customs of the United States. These factors in turn, makes tourists easy targets.

Some crime variance may be able to be explained by high tourist traffic. Areas such as Orlando, and some other tourist destinations such as Daytona beach, may have higher crime rates that have to do with increased tourist traffic. Unfortunately, Visit Florida does not collect tourism statistics at the county level and thus this theory cannot be adequately tested in this thesis.

The purpose of this research was to attempt to better understand the various factors of crime variance throughout Florida Counties. In order to gain a complete understanding of these factors effects on crime variance, however, it is necessary to conduct a study that will examine all aspects of these factors. These include, but are not limited to:

- Funding theories: Funding for law enforcement effects the crime rate because as funding increases or decreases, crime increases or decreases.
- Class distinction theories: Patterns of police behavior directly affect crime the rate because of the likelihood of police to take action or report a crime when dealing with different socioeconomic classes of people.
- Culture of poverty theories - Concentrations of the poor in urban areas promotes a culture of poverty, which in turn leads to a higher incidence of crime
- Demographic theories: There are three individual demographic correlates of crime: age, sex, and race. These factors determine if individuals are more or less likely to commit crimes.

- Climate theories- Climate factors into the rational consideration of the costs and benefits of crime.
- Tourism theories – Tourist destinations have higher crime rates that have to do with increased tourist traffic.

By utilizing these theories in the research, a complete understanding of crime variance among Florida counties is attainable.

Methodology and Hypotheses

To answer this research question, a review of international, national, and state level crime data was completed. Additionally, a review of the most salient influences on criminality was completed. Utilizing these information sources will provide a basis for my hypotheses that will allow a measurable outcome. Operational data for this study was obtained through the Florida Department of Law Enforcement public information database, as well as the United States Census. Crime data was obtained from the Florida Department of Law Enforcement 2016 Uniform Crime Index database. Socioeconomic and demographic data was obtained from the American Community Survey annual census report. Voter information including party registration was obtained through the Florida Division of Elections.

The information obtained through these data sources will be used to test my hypotheses, explore observable crime patterns, and create visual exhibits that compare crime factors by county. Since the given factors are based upon empirical data, this research will utilize quantitative methods. In this research, a regression analysis will be used for a cross section of data for the year 2016, taking into account the factors named above that influence the crime rate, in order to determine which factors are the most salient influences of crime in the State of Florida. This will be achieved by utilizing both step-wise and bivariate regression analyses processed through SPSS. Since the sample is small, 67 counties, relationships will be deemed statistically significant at the .10 level. Bivariate analysis will explore relationships between each separate independent variable and the dependent variable. A multivariate model including all variables of interest will then be tested to control for the influence of each variable on the other.

Since the sample is small and there are a large number of variables that are correlated with one another, stepwise regression analysis will be used to determine which independent variables should be entered into the model.

In this study, the unit of analysis will be by county. There are 67 counties in Florida. The dependent variable will be the 2016 crime rate per 100,000 population as reported by the individual counties to the FDLE.

Independent variables will include:

- Law enforcement spending per capita: the amount of money spent, as reported by the individual counties to the FDLE
- percent Black: the percent of county residents who identify as black according to the 2016 American Community Survey
- percent Hispanic: the percent of county residents who identify as Hispanic according to the 2016 American Community Survey.
- percent immigrant: the percent of county residents who identify as immigrants according to the 2016 American Community Survey.
- clearance rate per 100k: the measure of offenses that result in an arrest or charge per 100,000 individuals within a county population, as reported by the individual counties to the FDLE.
- population change: the measure of change in county populations from 2015 to 2016 according to the 2016 Florida Department of Law Enforcement UCR database.

- percent 18-39: the percent of county residents who have been identified as ages 18-39 according to the American Community Survey and the United States Census.
- percent living under poverty level: the percent of county residents who have been identified as having incomes less than the Federal poverty level standard according to the American Community survey and the United States Census.
- percent with less than a high school diploma: the percent of county residents that do not hold at least a high school diploma according to the 2016 American Community Survey.
- percent single parent families: the percent of county residents that identify as being a single parent family according to the 2016 American Community Survey.
- population density by county: The number of people living per square mile by county according to the 2016 American Community Survey and the United States Census.

The following hypotheses lay out the expected relationship between each independent variable and the dependent variable:

Hypothesis 1: There is a negative relationship between law enforcement spending and crime rate. As law enforcement funding positively increases, the crime rate decreases because there will be more resources to prevent and control crime. However, it is also possible that a positive relationship exists between these variables and that law enforcement spending is actually dependent on crime rate: the more crime a county has, the more money may need to be spent on criminal justice measures.

Hypothesis 2: There is a positive relationship between population density and crime rate. Counties with large urban areas will have a higher crime rate because crime is more likely to occur in densely populated areas, and the police are more likely to report and take action on crimes that occur in these areas. Densely populated areas bring more opportunity for crime as there are more potential victims. Densely populated areas also present less economic resources to individuals, and as a result, crime is seen as a means of economic survival. There is also breakdown of community standards in largely populated areas as people are less likely to know and interact with their neighbors.

Hypothesis 3: There is a positive relationship between counties with high poverty rates and crime rate. Counties with more impoverished individuals will have a higher crime rate because crime is an economic opportunity in impoverished areas. Individuals will look to crime as a means of survival when they have limited or no other resources.

Hypothesis 4: There is a positive relationship between individuals who identify as black and crime rate. Individuals who identify as black are more likely to live in densely populated areas due to displacement and have a lower socioeconomic status. Therefore, individuals who identify as black are more likely to become involved in crime as an economic opportunity after displacement to these limited resource areas. Those who identify as black are also more likely to face discrimination by the criminal justice system and are more likely to be arrested than other racial groups.

Hypothesis 5: There is a positive relationship between individuals who identify as

Hispanic and crime rate. Individuals who identify as Hispanic are more likely to have a lower socioeconomic status and live in densely populated areas due to displacement. Therefore, those who identify as Hispanic are more likely to become involved in crime as an economic opportunity after displacement. Those who identify as Hispanic are also more likely to face discrimination by the criminal justice system and are more likely to be arrested than some other racial groups.

Hypothesis 6: There is a positive relationship between individuals that are immigrants and crime rate. Individuals that are immigrants are more likely to be arrested by the police due to discrimination, and are more likely to lack of legitimate sources of income and socialization. There are also less resources presented to immigrants than other groups. These individuals then look to crime as a way to satisfy social and economic needs that cannot be met due to their immigrant status.

Hypothesis 7: There is a positive relationship between individuals who are male in the 18-39 range and crime rate. Males 18-39 are more likely to commit crimes because there is less access to legitimate sources of income, less cognitive and analytical skill, less legal and social costs for their criminal behaviors, and are more able-bodied. Therefore, crime is seen as an economic opportunity with little consequences to males in this age range. Males in this age range are also more physically capable than other age groups to carry out crime.

Hypothesis 8: There is a positive relationship between counties with booming population growth and crime rate. Densely populated areas present less social and economic opportunities to individuals. Therefore, areas with a high rate of population growth will have a higher crime rate

because individuals will use crime to satisfy both social and monetary needs after displacement by population growth.

Hypothesis 9: There is a positive relationship between counties with a large percentage of single parent families and crime rate. Counties with a large percentage of single parent families will have higher crime rates because single parent families are more likely to be disposed to criminality. These types of families are more likely to be disposed to criminality because they are more likely to have less income due to the absence of a parental figure and a two-income household. Therefore, these types of families will look to crime as a way to satisfy both social and economic needs.

Hypothesis 10: There is a positive relationship between individuals with less education and crime rate. Counties with less educated individuals will have a higher crime rate because there will be less economic opportunity for individuals who are less educated, and as a result these individuals will look to crime to satisfy their economic needs.

Hypothesis 11: There is a negative relationship between counties with a higher clearance rate and crime. Counties with a higher clearance rate will have more cases that resulted in either arrest or prosecution, leading to a lower crime rate due to the success of criminal justice measures. However, a positive relationship may also exist due to the fact that counties with a high clearance rate may also be arresting more individuals and solving more crimes as a result.

Table 1 Crime Rate per 100,000 Florida Counties

County	Crime Rate	County	Crime Rate
Alachua County	3,582.8	Lee County	2,086.4
Baker County	1,609.5	Leon County	5,655.4
Bay County	4,240.5	Levy County	2,897.4
Bradford County	1,745.6	Liberty County	103.0
Brevard County	3,115.9	Madison County	3,098.0
Broward County	3,581.6	Manatee County	2,640.6
Calhoun County	781.9	Marion County	2,631.1
Charlotte County	1,796.4	Martin County	1,899.0
Citrus County	1,619.7	Miami Dade County	4,118.0
Clay County	2,026.1	Monroe County	3,103.3
Collier County	1,558.5	Nassau County	1,761.3
Columbia County	3,274.2	Okaloosa County	2,961.8
DeSoto County	2,771.7	Okeechobee County	3,499.5
Dixie County	2,438.4	Orange County	4,321.3
Duval County	4,287.9	Osceola County	2,965.0
Escambia County	3,993.7	Palm Beach County	3,493.0
Flagler County	2,037.7	Pasco County	2,461.1
Franklin County	1,376.3	Pinellas County	3,827.5
Gadsden County	1,469.7	Polk County	2,746.0
Gilchrist County	705.6	Putnam County	3,113.5
Glades County	1,203.3	Santa Rosa County	1,303.5
Gulf County	1,617.8	Sarasota County	2,274.9
Hamilton County	2,120.7	Seminole County	2,652.1
Hardee County	2,178.2	St. Johns County	1,880.1
Hendry County	2,786.0	St. Lucie County	2,202.7
Hernando County	2,166.5	Sumter County	1,168.0
Highlands County	2,948.9	Suwannee County	2,018.1
Hillsborough County	2,081.3	Taylor County	3,185.3
Holmes County	1,524.8	Union County	610.6
Indian River County	2,131.7	Volusia County	3,561.8
Jackson County	2,071.7	Wakulla County	1,759.5
Jefferson County	2,027.9	Walton County	2,561.0
Lafayette County	846.8	Washington County	1,530.9
Lake County	2,314.9		

Median all Counties: 2,202.7 Average all Counties: 2419.8

Figure 1 Crime Rate per 100,000 in Florida counties

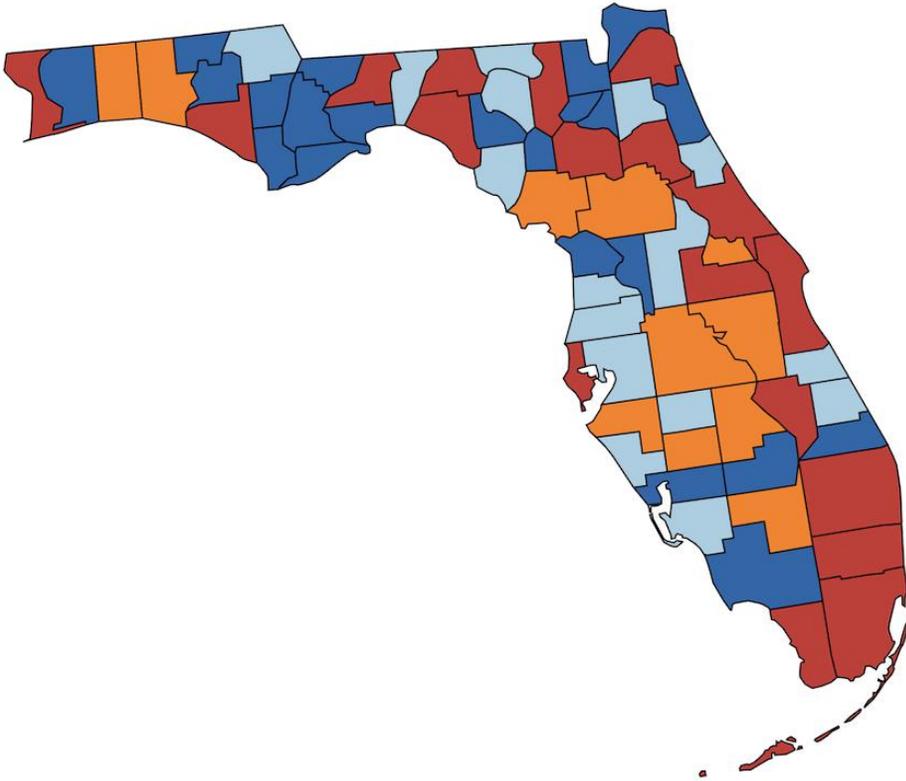
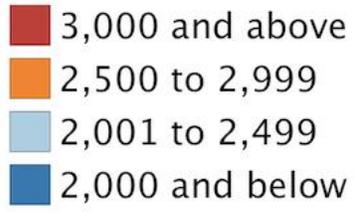


Table 2 Descriptive Statistics for Each Independent Variable

Independent Variable	Florida (Statewide)	Minimum Value	Maximum Value
Law Enforcement spending per capita	\$214.8	\$289.00 Calhoun	\$1,864.00 Monroe
Population per Square Mile	350.6	10 Liberty	3,347.5 Pinellas
Poverty Rate	14.7%	9.6% St. Johns	29.6% Hardee
Black	16.8%	3.1% Citrus	55.4% Gadsden
Hispanic	24.9%	2.3% Baker	65.6% Miami-Dade
Males 18-39	26.7%	13.9% Sumter	42.9% Alachua
Population Growth (2015-2016)	9.6%	-6.4% Bradford	22.4% Sumter
Single Parent-Families	7.76%	5.02% Sumter	22.65% Gadsden
Less than a High School Diploma	12.8%	6.8% St. John's	35.8% Hardee
Clearance Rate	24.3%	16.6% Leon	85.5% Union
Immigrant	20.2%	1% Baker	51.3% Miami-Dade

Regression Analysis of Crime Data

Univariate Analysis

In this study, crime rate per 100,000 county residents is the dependent variable. Table 1 shows that Leon County has the highest crime rate in the state of Florida followed by Orange County, Duval County, Bay County, and Miami-Dade County. On the other end of the spectrum, the county that enjoys the lowest crime rates in the state of Florida is Liberty County; followed by Union County, Gilchrist County, Calhoun County, and Lafayette County. The average crime rate per county in Florida is 2,419.8. The five counties that have the highest crime rates in the state, range from 5,655.4 to 4,118.0. The five counties with the lowest crime rates in the state, range from 103 to 846. The median crime rate for Florida Counties is 2,202.7, and St. Lucie County is at the median value. Looking at the Florida map of crime rates (Figure 1), it is clear that the Southern-most portion of Florida experiences some of the highest crime rates in the state. The Atlantic Coastal regions of the state also seem to display a trend of experiencing higher crime rates than the rest of the state. The Gulf coast of the state seems to enjoy lower crime rates than most of the state, as well as the lower Panhandle region. No pattern seems to emerge in the middle of state, where crime rates are dispersed from low to high.

The first independent variable in this model is law enforcement spending per capita. As seen in Table 2, Monroe County has the largest law enforcement spending per capita rate, at \$1,864.00. Broward, Baker, Glades, and Palm Beach counties follow Monroe in spending the most on Law Enforcement. Calhoun County spends the least of all counties on law enforcement, spending just \$289.00 per capita. Holmes, Washington, Santa Rosa, and Union counties follow Calhoun in spending the least on law enforcement. The average amount spent by counties per

capita on Law Enforcement is \$588.5. The standard deviation between counties for law enforcement spending is \$238.8. Statewide, Florida spent \$4,439,571,691 on law enforcement in 2015-2016, or \$214.8 per capita.

The next independent variable in this model is population density. Table 2 shows that Pinellas County is the most densely populated county in the state of Florida, with a density of 3,347.5 people per square mile. Broward, Santa Rosa, Miami-Dade, and Orange Counties have population densities in the top five of the state. The county with the lowest population density in the state of Florida is Liberty County, at 10 people per square mile. Glades, Lafayette, Franklin, and Taylor counties follow Liberty with the lowest population densities in the state. Florida's population density is 350.6. With these numbers in mind, it is clear that there is a lot of variance between the densest and least dense counties in the state. While Florida is an urban state overall, there are many rural counties as well.

Poverty rate is another independent variable that was measured in this model. Examining the data, Hardee County has the largest number of citizens living below the poverty level, at 29.6%. DeSoto, Okeechobee, Hendry, and Gadsden counties follow Hardee with the highest rates of poverty in the state. The county with the least amount citizens living below the poverty level is St. Johns County, at 9.6%. Clay, Seminole, Sumter, and Sarasota Counties follow St. John's with the least number of residents living below the poverty level. Rural areas of Florida seem to have higher poverty rates than urban areas. Statewide, 14.7% of Florida residents live under the federal poverty level.

Another independent variable that is measured in this model are individuals that identify as black. Examining the data, Gadsden County has the most residents that are black, making up 55.4% of their population (the only county in Florida with a majority African-American

population). Madison, Jefferson, Hamilton, and Leon counties follow Gadsden with the largest percentage of residents that are black in the state. The county with the least number of residents that are black is Citrus County, at 3.1%. St. Lucie, Pasco, Hernando, and Gilchrist counties follow Citrus with the least number of black residents in the state. Statewide, Florida about 16.8% of Floridians are black residents.

Another independent variable explored in this model are individuals who are Hispanic. As Table 2 displays, Miami-Dade County has the largest percentage of residents that are Hispanic, at 65.6%. Hendry, Osceola, Hardee, and DeSoto counties follow Miami-Dade with the largest number of residents that are Hispanic. The county with the least number of individuals that are Hispanic is Baker County, at 2.3%. Holmes, Washington, Dixie, and Bradford counties follow Baker with the least number of residents that are Hispanic. Hispanics are clustered in Southeast Florida and Central Florida with far fewer living in North Florida. Statewide, Florida has 24.9% Hispanic residents.

The next independent variable found in this model are males in the 18-39 range. Examining the raw data, Alachua County (home to the University of Florida) has the most residents who are male in the 18-39 age range, at 42.9%. Leon (home to Florida State University and Florida A&M University), Orange (home to the University of Central Florida), Lafayette, and Liberty counties follow Alachua with the largest number of males in the 18-39 age range. As Table 2 shows, the county with the least number of males in the 18-39 age range is Sumter County, at 13.9%. Charlotte, Citrus, Sarasota, and Highlands counties follow Sumter the least number of males in the 18-39 age range. These counties tend to have a higher percentage of retirees. Overall about 26.7% of Floridians are male and in the 18-39 age range.

This model also explored the impact of population growth between 2015 and 2016. The county that experienced the most population growth between 2015 and 2016 was Sumter County, at 22.4%. Sumter County is home to The Villages which is one of the fastest growing retirement communities in the country. Osceola, St. Johns, Walton, and Lee counties follow Sumter with the highest population growths in the state. Table 2 indicates that the County that experienced the least amount of population growth between 2015 and 2016 was Bradford County, at -6.4%. Hamilton, Jefferson, Madison, and Dixie counties follow Bradford with the least amount of population growth in the state, actually losing residents instead of gaining. Statewide Florida's population grew by 9.6% between 2015 and 2016.

The next independent variable that is in this model is the percentage of single parent families within a county. Table 2 shows that the county with the least number of single parent families is Sumter, with only 5.02% of households headed by a single parent. Monroe, Charlotte, Martin, and Liberty follow Sumter with the lowest numbers of single parent family households. The county with the largest number of single parent households is Gadsden, with 22.65% of households headed by one parent. Hamilton, Miami-Dade, Union, and Osceola Counties follow Gadsden with the largest numbers of single parent residencies. Statewide the percentage of households in Florida headed by a single parent is 7.76%.

Another independent variable included in this model is education, specifically the number of individuals with less than a high school diploma. As seen in Table 2, the county that has the largest percentage individuals with less than a high school diploma is Hardee County, at 35.8%. Hendry, Okeechobee, DeSoto, and Calhoun counties follow Hardee with the largest percentages of individuals with less than a high school diploma. The county with the smallest percentage of individuals with less than a high school diploma is St. Johns, at 6.8%. Sarasota, Seminole, Leon,

and Alachua counties follow St. John's in the top five in this category. Statewide, only 12.8% of all Floridians do not have a high school diploma.

The next independent variable in this model is clearance rate. As seen in Table 2, Union county has the highest clearance rate in Florida with at 85.6%. Bay, Calhoun, Sumter, and Bradford counties follow Union with the top five clearance rates in the state. The county that has the lowest clearance rate is Leon County, at 16.6%. Miami-Dade, Duval, St. Johns, and Broward counties follow Leon with the lowest clearance rates in the state. The statewide clearance rate for Florida is 24.3%.

The last independent variable explored in this model are individuals who are immigrants. As seen in Table 2, the county that has the smallest percentage of immigrants is Baker County, at 1%. Jefferson, Taylor, Bradford, and Holmes counties follow Baker with the smallest percentages of immigrant residents. The county with the largest percentage of immigrants is Miami-Dade, at 51.3%. Broward, Henry, Collier, and Palm Beach counties follow Miami-Dade in the top five in this category. Immigrants are clustered in South Florida, with far fewer living in the Northern portions of the State. Statewide, immigrants comprise about 20.2% of Florida's population.

Table 3 Explaining Florida Crime Rates by County: Bivariate Linear Regression Analysis

Independent Variable	B	Standard Error	Beta	T	Significance
Law Enforcement Spending per Capita	1.585	.499	.367	3.179	.002***
Percent Black	21.474	13.340	.196	1.610	.112
Percent Hispanic	22.135	10.040	.264	2.205	.031**
Population Density	.753	.226	.383	3.340	.001***
Population change (2015-2016)	21.452	24.525	.108	.875	.385
Males 18-39	52.610	23.541	.267	2.235	.029**
Percent under federal poverty level	-4.037	26.352	-.019	-.153	.879
Percent Immigrant Population	41.026	14.699	.327	2.791	.007***
Percent with less than a High School Diploma	-40.788	18.427	-.265	-2.214	.030**
Percent Single Parent Family's	64.984	40.115	.197	1.620	.110
Clearance Rate	-33.273	8.605	-.432	-3.867	< .001***

Significance Levels: *** .01, ** .05, * .10

Bivariate Analysis

In order to test each hypothesis, a bivariate regression was run for each independent variable to test its relationship with crime rate. Table 3 displays the results of these separate regression analyses. Because of the small sample size of just 67 counties in one year, a variable is considered to be statistically significant if it is at .10 or less.

The first independent variable that was tested in the bivariate analysis was law enforcement spending per capita. As evidenced above, county spending per capita on criminal justice has a positive, statistically significant relationship with crime rate. For each one dollar increase in spending per capita, crime rate rises by 1.585. This is opposite what was hypothesized and suggests that areas with high crime are spending more money to combat crime, rather than spending "causing" a higher crime rate. Thus, it seems that law enforcement spending is likely a dependent variable in this relationship.

The next independent variable that was examined in this model was the percent of individuals that are black. As evidenced above, the percent of residents in a county that are Black has no statistically significant relationship with the crime rate. This does not meet the expectation of the hypothesis that counties with higher levels of Blacks will have higher crime rates.

This model also looked at the percent of residents that are Hispanic within a county. As evidenced in the above table, the percent of residents that are Hispanic within a county has a positive, statistically significant relationship with the crime rate. This supports the hypothesis

that counties with higher levels of Hispanics will have higher crime rates. A one percent increase in the county population of Hispanics leads to a 22.1 increase in county crime rate per capita.

This model also tested how population density affects crime rates. As evidenced above, county population density has a positive, statistically significant relationship with crime rate. This supports the hypothesis that counties with more dense populations will have higher crime rates. A one percent increase in the population density of a county, leads to a .753 increase in county crime rate per capita.

Another independent variable that was looked at in this experiment was the population change from 2015-2016 per county. As evidenced above, the percent of population change within a county showed no statistically significant relationship with the crime rate. This does not meet the expectation of the hypothesis that county with rapid population increases experience rapid crime rate increases.

The next independent variable that was measured in this experiment was the percent of males 18-39. According to this model, the percent of males 18-39 within a county population has a positive, statistically significant relationship with the crime rate in a county. This supports the hypothesis that counties with high levels of males in the 18-39 age range will have higher crime rates. A one percent increase in the county population of males in the 18-39 age range leads to a 52.610 increase in county crime rate per capita.

This model also looked at the percent of individuals living below the federal poverty level. Observing the data, there is no statistically significant relationship between individuals living below the federal poverty level and crime rate. This does not meet the hypothesis

expectation that as the number of individuals living below the federal poverty level increases within a county, the crime rate also increases.

Another relationship explored was the impact of county immigrant population on crime rate. As Table 3 shows, there is a positive statistically significant relationship between the percent of county immigrant population and crime rate. A one percent increase in immigrant population is associated with a 41.026 increase in crime rate. This supports the projected hypothesis.

This model also analyzed the relationship between those individuals residing in a county with less than a high school diploma and crime rate. Examining this data, there is a negative, statistically significant relationship between individuals with less than a high school diploma and crime rate. A one percent increase in the number of individuals without a high school diploma leads to a -40.788 decrease in county crime rate per capita. This was an unexpected result as theory would suggest that high percentages of less educated residents would result in higher crime rates rather than lower crime rates.

The next independent variable examined was single-parent families. Examining the data, there is no statistically significant relationship between single-parent families and crime rate, although it just missed the cut off of .10 with a p value of .110. Nonetheless, there is a positive relationship between the percent of single parent families and crime rate as was hypothesized with a one percent increase in single parent families associated with an increase of 65 crimes per 100,000 in a county.

The last bivariate model analyzed the relationship between clearance rate and crime rate. As hypothesized, there was a statistically significant negative relationship: for each 1 unit

increase in clearance rate per 100,000, crime rate decreased by 33 per 100,000. Thus, counties with higher clearance rates (those that arrested and brought charges in a higher percent of cases) had lower crime rates.

After exploring each bivariate regression separately, a multivariate linear regression was run using ten of the eleven independent variables discussed above. This full model excluded law enforcement spending since it seems likely that it is dependent on crime rate rather than a factor influencing crime rate. This initial multivariate model (see Appendix I) resulted in a relatively high R-squared of .415 but with only one statistically significant relationship (.10 or less) among the independent variables and a statistically significant F statistic indicating the model as a whole was significant. Further, the data showed a number of contradictory results in terms of expected direction and a high level of multi-collinearity among the pairs of independent variables. Variance inflation factors were uniformly high (with six variables between 1.5 and 4.9 and four variables greater than 5.0) and tolerance values were quite low (.67 to .13). All of this evidence points to severe multicollinearity as a problem with the full model run with linear regression.

To remedy multicollinearity and determine which independent variables should be left in the multivariate model, stepwise regression was used in SPSS. In stepwise regression, a series of sequential procedures are used to determine which variables are adding explanatory power to the model and which should be excluded based on multicollinearity or lack of statistical significance. Table 4 displays the stepwise regression results. The best model includes three of the variables identified as statistically significant in the bivariate regressions: clearance rate, the percent of males in the 18-39 age category, and population density. Collinearity statistics indicate that multicollinearity is no longer a problem with the model: tolerance values range from .89 to .99,

Variance Inflation Factors range from just 1.4 to 1.1, and coefficient correlations are less than .35.

Table 4 Explaining Florida Crime Rates by County: Multivariate Stepwise Regression Results

Independent Variable	B	Standard Error	Beta	t	Significance
Constant	1776.121	632.308		2.809	.007
Clearance Rate	-27.133	8.433	-.353	-3.217	.002
Males 18-39 %	52.383	20.429	.266	2.564	.013
Pop Density	.513	.216	.261	2.378	.020

Significance Levels: *** .01, ** .05, * .10

R-Square = .323 Adjusted R-Square = .291 F = 10.034***

Multivariate Analysis

As Table 4 displays, the model as a whole is statistically significant and explains about 32% of the variance in crime rate. Clearance rate seems to be the most important explanatory variable. It is statistically significant and has the highest standardized coefficient (Beta) at -.35. For each one point increase in county clearance rate, crime rate falls by 27 crimes per 100,000. The percent of males from 18-39 and population density are also statistically significant, have about equal weight according to Beta, and have a positive relationship with crime rate. A one percent increase in a county's young male population leads to an increase of 52 crimes per 100,000 population. Urban counties also have higher crime rates than rural ones in Florida. A two-point increase in population per square mile leads to an increase of one crime per 100,000.

Conclusions

The aim of this study was to explain the variance in crime rates among Florida's 67 counties in 2016. Eleven independent variables were tested with bivariate regression and seven had statistically significant relationships with county crime rate. Two variables, the percent of people with less than a high school education and clearance rate, had negative relationships with crime rate. The other five had a positive relationship: law enforcement spending, percent Hispanic, population density, the population of males between the ages of 18-39, immigrant population percent. A multivariate model was run using stepwise regression to deal with severe multicollinearity among the independent variables. Ultimately three variables were included in the multivariate model and all had statistically significant relationships: clearance rate had the strongest effect with a negative association and population density and males 18-39 had a moderate positive effect.

The results obtained through this research study indicate that the hypothesis suggesting a negative relationship between law enforcement funding and crime rate is not supported. The bivariate regression model found that as law enforcement spending increases, crime rate increases as well. This suggests that counties with higher crime rates must spend more money to combat and prevent crime, rather than spending actually causing a higher crime rate. Thus, it seems that law enforcement spending is a dependent variable in this relationship.

Three variables were statistically significant in the bivariate models and in the multivariate regression: clearance rate, population density, and male population 18-39. Clearance rate had an inverse relationship with crime rate as was hypothesized. Thus, it seems that counties

that are more aggressive and successful in arresting and bringing charges against suspects also have lower crime rates. This may be due to a deterrent effect as potential criminals may decide not to pursue certain crimes in areas where they believe there is a higher chance of getting arrested and charged. Population per square mile had a positive association with crime rate as predicted. This is due to the fact that densely populated areas present more opportunity for crimes to occur, and an increased likelihood of the police to report and take action on crimes that occur in these areas. Other reasons include the presentation of less economic resources to individuals in these areas, and the breakdown of community standards where people are less likely to know and interact with their neighbors. As a result, crime is seen as a means of economic and social satisfaction in densely populated areas. The percentage of males 18-39 also had a positive relationship with crime rate as hypothesized. This is due to the fact that males 18-39 are more likely to commit crimes because of less access to legitimate sources of income, less cognitive and analytical skill, less legal and social costs for their criminal behaviors, and more physical capability than other age groups to carry out crime.

Three other variables were statistically significant in the bivariate analyses but were excluded from the multivariate model by the stepwise procedure: percent Hispanic, percent immigrant, and the percent with less than a high school diploma. As predicted, the percentage of residents in a county that are Hispanic had a positive relationship with crime rate. This may be due to the fact that Hispanic individuals are more likely to be involved in crime due to a lower socioeconomic status. Thus, these individuals look to crime as a way to satisfy both economic and social needs. These individuals are also more likely to be arrested due to discrimination by the criminal justice system. The percent of immigrants in a county also had a positive association with crime rate as hypothesized. This may be due to the fact that immigrants are more likely to

be arrested by the police due to discrimination, and are more likely to become involved in crime due to lack of legitimate sources of income. These individuals then look to crime as a way to satisfy social and economic needs that cannot be met due to their immigrant status. Surprisingly, the percentage of individuals with less than a high school diploma had a negative relationship with crime rate. This was opposite the hypothesis that counties with higher levels of uneducated individuals will experience higher crime rates. A possible explanation for this is that individuals with less than a high school diploma in Florida may tend to live in more rural counties of the state that experience less crime.

Four variables in this study were not statistically significant in either of the models including the percent black, population change, the percent living under the federal poverty level, and the percent of single parent families. Possible reasons that the percentage of individuals that are black may have had no statistically significant relationship with crime rate may include the fact that Gadsden, Jefferson, and Hamilton counties, which collectively have the most black residents in the state, all saw significant drops in their crime rates between 2015 and 2016. 2017 data which was not included in this study, however, seems to indicate that these drops were short-term. The years 2015 and 2016 therefore may be outliers in Florida crime data when it comes to the larger picture of the relationship between individuals who identify as black and crime rates. This may explain why areas with large amounts of black residents did not experience higher crime rates as the literature seemed to suggest. Population change also did not have a statistically significant relationship with crime rate. Possible explanations may include the fact that individuals moving into the state are not moving into urban areas and displacing other individuals. Individuals moving into the state also may be pursuing legitimate opportunities and not contributing to crime rates. Those leaving the state may also be allowing more opportunities

for other individuals to participate economically. The percentage of individuals living below the federal poverty also had no relationship with crime rate in this study. Possible explanations may include the fact that state and federal assistance programs such as Welfare, WIC, and SNAP are able to effectively meet the needs of individuals living below the federal poverty level, in turn, meaning that these individuals do not have to turn to crime to satisfy economic needs. Finally, the percentage of single parent families also showed no statistically significant correlation to crime rate. Possible explanations of this may also include the success of state and federal assistance programs such as single parent grants, TANF, SNAP, and WIC, which may provide enough for these families economically, ultimately, leading them to turn away from crime as an economic mean.

This research was limited by the small number of cases with just 67 counties and one year of crime data (2016). Due to this, there was an issue of multicollinearity in the data that made it difficult to examine all of the independent variables in the same model. Another limit of this research is the potential for ecological fallacy. That is, treating counties as if they were people. This concept may help explain the contradictory results that were observed for education levels. While counties with higher percentages of individuals without high school degrees had lower crime rates, at the county level this does not mean that individuals with less education were actually committing fewer crimes, it means only that these counties had lower crime rates. At the individual level, it is known from previous studies that individuals with low education are more likely to commit crimes. This research was also limited by the lack of data on illegal immigrants and tourism by county in the State of Florida. Both of these statistics are kept only at the state-wide level. Other variables such as weather were limited due to the fact that Florida has a mostly uniform climate.

Future research may consider adding more years to the Florida crime rate data, as well as additional states for the same year. Adding more states and counties over a number of years may also be insightful. Adding these other states, counties, and years may allow the research to look at other variables such as climate, tourism, and illegal immigrants. It would also reduce the possibility of multicollinearity and allow the inclusion of more if not all of the possible independent variables in the same model. Future research may also consider splitting up the dependent variable of crime rate across violent crimes and low-level offenses. Other possibilities would be to look at the individual level to explain crime rates, either by using surveys of individuals or utilizing crime data on individuals convicted of crimes from court or prison records. These considerations may allow for a more complete analysis of criminality in the State of Florida, and the avoidance of ecological fallacy.

Overall, this research indicates that urban areas seem to be more crime prone, as do counties with high percentages of young males. There are a few things that policy makers may be able to do to combat crime associated with these high-crime risk variables. One thing that policy makers may be able to do to combat crime in urban areas is to protect the interests of those individuals who are at risk of resource loss due to city development. Loss of resources such as jobs and affordable housing may drive up crime rates in urban areas due to the loss of economic opportunity incurred by some individuals as cities expand and develop further. Policymakers should consider replacing these lost resources with alternative measures and offer assistance to those individuals who incur hardship from these developments. Policy makers may also consider extending more opportunities to those residents in the state who are males in the 18-39 range. Opportunities such as jobs, education, and affordable housing may help crime rates decline in areas with high levels of these individuals. One of the themes associated with these

variables is overall lack of opportunity. If policymakers can implement ways for these individuals to have a legitimate income, crime rates will more than likely decline as economic needs are met. This research has indicated the possible successes of state and federal assistance programs associated with those individuals living below the poverty level and single parent families. Similar opportunities for individuals living in urban areas, immigrants and young males may also see success if they are implemented by policymakers. Things that may be done by policymakers to bring down the crime rate overall may also include proactive policing techniques and the implementation of rehabilitation programs for certain types of offenders. Proactive policing techniques may help prevent crime before it happens, and rehabilitation may be useful in preventing certain types of offenders from re-offending. Finally, policy makers may want to redouble efforts to “clear” crimes since counties with higher rates of arrests leading to charges for crimes that did happen also had lower crime rates.

APPENDIX I: Full Multivariate Model

Explaining Crime Rates in Florida Counties 2016

Table 5 Signs of Multicollinearity in the Full Model Using Linear Regression

Variable	B Unstandardized Coefficient	Std. Error	Beta Standardized Coefficient	t	Sig.	Tolerance Value	VIF Variance Inflation Factor
(Constant)	1634.371	899.485		1.817	.075	.413	2.419
% Black	-.698	17.437	-.006	-.040	.968	.132	7.604
% Hispanic	15.159	23.654	.181	.641	.524	.673	1.487
Pop Density	.291	.245	.148	1.184	.241	.384	2.605
Pop Change %	-29.423	32.810	-.148	-.897	.374	.561	1.783
Males 18-39%	22.896	26.880	.116	.852	.398	.275	3.640
Poverty %	67.671	41.442	.318	1.633	.108	.181	5.514
Immigrant %	8.859	30.100	.071	.294	.770	.173	5.768
Less than HS %	-99.164	37.822	-.644	-2.622	.011	.305	3.276
Sngl Prnt Fmly%	62.073	61.028	.188	1.017	.313	.579	1.729
Clearance Rate	-12.874	10.340	-.167	-1.245	.218	.413	2.419

R Square = .415

F = 3.971

Sig. <.001

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