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The Changing Nature of Homicide and Its Impact on Homicide Clearance Rates: A Quantitative Analysis of Two Trends From 1984-2009

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THE CHANGING NATURE OF HOMICIDE AND ITS IMPACT ON HOMICIDE
CLEARANCE RATES: A QUANTITATIVE ANALYSIS OF
TWO TRENDS FROM 1984-2009.

(Spine title: Predictors of Homicide Clearance Rates)

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by

Lauren M. Korosec

Graduate Program in Sociology

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts

The School of Graduate and Postdoctoral Studies
The University of Western Ontario
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THE UNIVERSITY OF WESTERN ONTARIO
School of Graduate and Postdoctoral Studies
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Abstract

The following analyses uses the Federal Bureau of Investigation's (FBI) Supplementary Homicide Report (SHR) data from 1984 to 2009 to examine factors that predict whether a homicide will be cleared or not (N=439,542). Two theories inform the current study: 1) Black's theory of law (discretionary variables) proposes that characteristics of the victim, such as age or race, influence how diligently police work to solve a homicide; and 2) non-discretionary theories propose that characteristics of the homicide act, such as geographic location and weapon use, are more important to the solvability of a homicide. Preliminary analyses of clearance rates indicate decreasing rates from 1984-2004, and increasing rates from 2004-2009; therefore, separate analyses are performed for each trend.

Results indicate that firearm use, unknown weapons, males, minority victims, population size, and western regions predict lower clearance rates. However, predicted probabilities analysis provide a more complete picture of the relative importance of each variable. Most variables support non-discretionary theories of crime, where aspects of the homicide itself determine its solvability. Theoretical implications are discussed alongside directions for future research oriented toward more practical analyses of homicide clearance rates and police practices.

Key words: homicide; clearance rates; theory of law; victim characteristics

"I never had any friends later on like the ones I had when I was twelve. Jesus, does anyone?"

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Chapter 1: Introduction

Homicide has been a widely studied topic within the field of Criminology and Criminal

Justice. The nature of homicide, homicide investigation, and criminal profiling are just some of

the varied topics that are connected to the study of homicide. One aspect of homicide that has not

received as much attention is the clearance rate: whether a homicide is considered solved or not

by charging one or more suspects. The clearance rate for homicide has been steadily declining

since the 1960s, with solved cases decreasing from 90% in 1960 to 66% in 2009 for homicides in

the United States (Cardarelli & Cavangh, 1992; Federal Bureau of Investigation [FBI], 2009).

Despite the advances in DNA testing and increased reporting practices, the clearance rates

continue to decline (Litwin, 2004). Although the declining clearance rate is a national concern

for both the police and the public, there is a limited amount of research that investigates these

rates and the subsequent changing nature of homicide (Regoeczi et al., 2000). The lack of

research is somewhat worrisome for police and the public because of safety and deterrence

surrounding homicide. The safety of the public is at risk if accused offenders are operating freely

either committing more homicides or other serious offenses. The general deterrence for homicide

is also weakened if future offenders see homicide as an easy crime to get away with. Potential

murderers may be swayed to commit a crime because of the declining certainty of punishment.

The implications for explaining the declining homicide clearance rates in the United

States are advantageous not only for knowledge about the changing nature of homicide, but also

for public safety. The nature of homicide has clearly had an impact on the clearance rate and it is

important to elucidate these changes. This information can lead to new insights about murderers

and potential murderers and the evolving nature of homicide. On the other hand, public safety

implications of this research are even more important to consider. As mentioned earlier, the declining clearance rate affects both specific and general deterrence for current and future offenders. Society is morally opposed to the act of murder, and its laws and criminal justice system should reflect that. However, if the clearance rate continues to decline without inquiry, then offenders may not view murder as a serious crime with a certainty of punishment. In addition, those victims and families already affected by homicide do not receive the justice they deserve from apprehending and prosecuting the offender. Therefore, it is worthwhile to investigate possible contributing factors to the declining clearance rate for homicide and the changing nature of homicide in recent times for both knowledge and public safety reasons.

There are two major competing theories that will be used to guide the current study. Black's theory of law is one theory that posits discretionary factors, such as age, sex, and race of the victim as heavily influential in how diligently the police will work to solve a crime (Black, 1976). For example, a murder of a white, affluent male would have a greater chance of their crime being cleared because they are a more visible member of a community. On the other hand, a murder of a poor, Black female would be less likely to be cleared. The characteristics that are posited to influence the solvability of a crime in Black's theory of law are referred to as extralegal victim characteristics because they are not directly linked to the homicide itself; these are characteristics of the victim that are outside the commission of the crime.

The alternative theories that will be used to explain the decline in homicide clearance rates are the non-discretionary theories of police response to deviance (Gottfredson & Hindelang, 1979; Klinger, 1997). These theories suggest that the primary characteristics of the homicidal act, such as weapon use, geographic region, and city size, are most important in determining the

solvability of the crime. Police are said to work diligently to clear all homicides regardless of the victim's characteristics (Klinger, 1997). Factors that are considered to have impact on the clearance of a homicide in these theories include presence of DNA, victim-offender relationship, and police workload. These factors are referred to as non-discretionary factors because they concern the crime itself and are not subject to police discretion.

The time component of the current study will be used to address the relative lack of research that accounts for yearly changes in the predictors of homicide clearance. Most research either uses cross-sectional data for a few years or cross-sectional data for short time periods in a longer time span. The nature of homicide is best studied using a wide range of yearly data, however the literature has yet to provide recent, long term studies of homicide clearance. The present study accounts for a time effect by analyzing data for each year over 25 years using a national dataset. The goal of the current study is to use both discretionary and non-discretionary factors to examine the declining homicide clearance rates and the changing nature of homicide in the United States.

Chapter 2: Theoretical Context and Literature Review

There are two competing theoretical approaches that will be informing the current research: Black's theory of law and non-discretionary theories. These two theories can be simplified to the use of discretionary vs. non-discretionary factors and their impacts on the solvability of homicide. Discretionary factors within Black's theory of law suggest that clearance rates are influenced by stratification in terms of the victim and the area of the homicide (Black, 1976). For example, lower socioeconomic victims and neighbourhoods would be of lower priority than homicides involving higher socioeconomic victims and neighbourhoods. On the other hand, non-discretionary factors suggest that police treat all homicide cases equally and there are no extralegal factors that influence how efficiently a homicide is cleared. For example, Klinger (1997) proposes that social factors, such as the race or gender of the victim, play a marginal role in solving a homicide. Therefore, non-discretionary factors are the specific details about the murder—such as workload and size of the community—that are influential in determining the homicide clearance rates.

2.1 Discretionary Factors and Black's Theory of Law

Theoretical Framework

Law is a form of governmental social control and it regulates the state and its citizens (Black, 1976). However, law is not the only form of social control because it does not include the everyday life of each citizen. According to Black (1976), law is quantifiable, where individuals can receive more or less law. The amount of law can also vary in time and space, where certain decades, years, or months can receive more or less law, and different countries, states, and cities

can receive more or less law. The reasons for the variability of law will be discussed further below.

Black (1976) uses the theory of law to define the behaviour of law in relation to the amount of social control in a situation. The theory of law states that law varies inversely with other social control. Although law is a form of social control, other forms of social control, such as family, peer networks, and neighbourhoods also exist (Black, 1976). It is when these other forms of social control decrease, that the amount of law increases (Black, 1976). For example, the amount of law will be less in a situation where the family is a strong force of social control, because the family provides its own rules to govern its member's behaviour. On the other hand, in a situation where the family social control is less, there will be more law to compensate. The proposition that law varies inversely with social control can apply to any situation where law and social control can be quantified, from interactions between two people to international social life (Black, 1976).

The theory of law not only predicts the quantity of law, but also the definition of illegal behaviour, and the crime rate itself (Black, 1976). The theory does not apply to the individual motivation of the offender, similar to labeling theory (Lemert, 1967) or subcultural theory (Miller, 1958); instead, the theory of law predicts the behaviour of the law in various situations. The theory of law can define illegal actions through the behaviour of the law in response to a number of occurrences. For example, a family who does not exert social control over its members is more likely to produce a delinquent child because the actions of this child are more likely to be defined as delinquent by the law (Black, 1976). On the other hand, a family with strong social control over its members is less likely to produce a delinquent child, or a delinquent

child is less likely to be defined as such; instead, the child may be viewed as "going through a phase" or explained through "boys will be boys". It is in this manner that the theory of law is able to define illegal behaviour in differing circumstances. The theory of law can also determine the crime rate of an area through the law's behaviour in reaction to criminals. For example, a delinquent child from a family with weak social control is more likely to be arrested, and subsequently more likely to be severely sentenced than a child from a family with strong social control (Black, 1976).

Another illustration of the behaviour of law and its predictive ability can be seen in homicide clearance with victims from different social characteristics. For example, a Black female from a neighbourhood with low social control and high disorganization would be less likely to have her case solved in comparison to a victim who is white, male, and from an affluent neighbourhood. Black (1976) proposes that victims from lower social life circumstances will receive less law in comparison to victims from high social status. The theory of law operates according to who the quantity of law is effecting. Offenders from areas with low social control will receive more law (more arrests, searches), whereas victims from areas with low social control will receive less law (complaints ignored, cases unsolved).

Corsianos (2003) measures the quantity of law in the specific instance of victims and why certain groups of victims are afforded more law than others through police discretion and classification of 'high profile' cases. Police officers are given a large amount of discretion in their daily duties and this discretion can be influenced both by the individual officer's belief systems (Black, 1973), and through the occupational culture of policing (Corsianos, 2001). In her qualitative study of a large police department, Corsianos (2003) examines detective's decision-

making in determining whether a case is considered 'high profile' and therefore warrants

additional time and resources. Corisanos (2003) identifies six factors that, when present,

determine a case to be 'high profile': 'status' of the victim, 'status' of the accused, role of the

media, desire by police to conceal questionable or illegal police activity, possible political

'bombshells', and the public's reaction/expectation of a case. The 'status' of the victim is

considered an important factor in determining the course of an investigation, specifically, the

socio-economic status of the victim. Corsianos (2003) notes that cases with victims who are

affluent tend to receive more police attention and treated as 'high profile' regardless of the media

attention the case receives. On the other hand, Corianos (2003) also notes that race and gender

alone did not determine the course of investigation, rather, it was the combination of socio-

economic status of the victim and the neighbourhood in which the crime took place, the pressure

police received from other residents and family members of the victim, and the media attention

the case received. The 'status' of the accused also plays an important role in police

investigations, and tends to be prioritized internally when the accused is very affluent or is

related to an officer in the department (Corsianos, 2003). Media publicity is another factor that

can make a case 'high profile' because of the increased accountability and pressure felt by the

officers. Police departments also use media attention to either disseminate information about a

crime, or keep information hidden from the public in the case of publication bans (Corsianos,

2003; Innes, 2002). A case is also deemed 'high profile' if the police are attempting to cover

questionable or illegal practices on the part of the police. Higher ranking officers maintain the

police occupational culture through keeping these cases secret and of high importance

(Corsianos, 2003). Politically hot cases, such as crimes committed during protests, can be

considered 'high profile' and handled quietly to avoid negative media attention on the department. Finally, the public's reaction to certain crimes can elevate specific cases to a 'high profile' status because of pressures on the department to solve the case (Corsianos, 2003). The public reaction often provokes a media reaction, which increases the chance that a case will become 'high profile' (Corsianos, 2003).

These six factors work together to determine the status of a case, and subsequently, those 'high profile' cases were more diligently investigated because the police were subject to more scrutiny and accountability. The cases that were elevated to 'high profile' status would tend to be cleared quicker because of the increased resources and pressures on police through the six factors that Corisanos (2003) identified.

Black (1976) uses the theory of law to explain different aspects of social life through a macro lens: stratification, morphology, culture, organization and social control. Stratification is the vertical component of social life that includes socioeconomic status, access to food/water, and other things that are unequally distributed. Morphology is the horizontal component of social life that includes the horizontal distribution of people and their relations to one another. Culture is the symbolic component of social life that includes religion, mores, and technology. Organization is the corporate component of social life that includes the capacity for collective action within groups, workforces, families...etc. Social control is the normative component of social life includes definitions around deviant behaviour and the response to deviant behaviour (Black, 1976). Black (1976) uses the theory of law to predict the behaviour of law in each of the aspects of social life. In the case of homicide victims, there will be less law for victims that are of lower standing within the different aspects of social life.

Stratification

        Stratification is the vertical aspect of social life, which includes the unequal distributions of any material conditions of existence (Black, 1976). Material conditions can include, but are not limited to, property, food/water, money, or luxuries. Stratification can vary by vertical distance (magnitude in difference of wealth), vertical segmentation (degree to which wealth is segmented into separate layers), and vertical mobility (movement of people from one rank to another).

        Black (1976) uses vertical distance to quantify stratification, and measures it as the difference in wealth, on average, between each individual and the difference between the least and most wealthy in a society. Through quantification, it is possible to predict and explain the quantity of law in relation to stratification. Black (1976) proposes that law varies directly with stratification. This implies that where there is more stratification, or unequal distribution, there is more law. For instance, in communities where social welfare and housing are more prevalent, criminal offenders will receive more law for their actions, while victims of crimes will go relatively unnoticed.

        Other theories have identified a negative relationship between social class and crime. Mann (1993) reviews three major meta-analyses on the relation of social class and crime and concludes that there is an association between economic level and crime and delinquency, and that lower classes experience an over-representation in social control enforcement because of this relationship. Mann (1993) notes however, that this relationship is not as simple as it appears; the social structural elements of unemployment, poverty, and inequality need to be incorporated into the relationship of social class and crime for a better understanding.

There are several variables that contribute to stratification and its influence on crime. Platt (1978) maintains that 'street crime' is not just about marginalized lower classes committing more crime; it is an intra-class and intra-racial phenomenon where Black and Hispanic minorities are primarily victims of their circumstances. Related to Platt's (1978) concept of 'street crime' as an intra-racial phenomenon, critical race theorists also propose that the relationship between social class and crime is mediated by race. Delgado and Stefancic (2000) proposes that race is a proxy for socio-economic factors, and that the overrepresentation of minority offenders in the criminal justice system is a result of the lower life chances that are faced by minorities. Delgado and Stefancic (2000) also state that because of the economic deprivation of racial minority individuals, desperate means of survival, such as crime, are sought to achieve equal social status. Relative deprivation builds on this theory and postulates that areas of higher inequality will experience higher crime rates because of the pressure to 'catch-up' to others by use of any means necessary (Merton, 1968).

Morphology

Morphology is the horizontal aspect of social life, or the distribution of people, resources, labour...etc. (Black, 1976). Distribution can also refer to patterns across social life, such as patterns of social mobility, economic stability, and governance. Morphology is akin to Durkheim's organic and mechanical solidarity, however, Black (1976) recognizes that there can be little differentiation in large populations and a lot of differentiation in small populations (Durkheim, 1893). The level of interdependence, total dependence, and independence among a population is what determines the level of differentiation, and in turn, the amount of law that population will receive (Black, 1976).

Black (1976) uses interdependence to quantify the level of differentiation, or morphology, within a society. Black (1976) proposes that the relationship between law and differentiation is curvilinear, where there is the least law at the extreme ends of independence and total dependence, and there is the most law in the middle where there is interdependence. There will be less law in societies where individuals work independent of each other (eg. farming communities) and there will also be less law where individuals work dependent on one another (eg. supply chains). On the other hand, societies will experience more law where people work interdependently among one another. For example, in a free market setting where individuals and groups rely on each other, but also have other choices, there will be more law.

Culture

Culture is the symbolic aspect of social life, where ideas, opinions, and theories emerge (Black, 1976). Culture includes conceptions of religion, law, politics, art, and many other aspects of social life. The social sphere of culture is symbolic because it represents the norms of a society. Black (1976) explains that societies can have more and less culture, where a newcomer can need more or less time to learn the culture of a society.

Culture is extremely variable, where different aspects of a culture are rich and complex, while others are simple and straightforward. Black (1976) proposes that societies with more culture will have more law. Those individuals or societies that have greater knowledge and access to culture are more likely to have cultural conflicts. Black (1976) gives examples of communities having more or less culture depending on their settlement patterns, geographic regions, and populations. For example, coastal regions will have more culture than interior regions and urban regions more culture than rural regions. Therefore, interior and rural regions,

such as the south, may experience less law and be more apt to settle disputes privately than involving the police. Offenders may receive less law, and subsequently victims may receive more law in interior and rural regions.

Organization

Organization is the corporate aspect of social life, or the capacity for collective action (Black, 1976). The capacity for collective action can be measured using numbers of administrative officers, numbers of human resource personnel, quantity of centralized decision-making, and amount of political representation. The organizational levels of society vary, like other social variables, across time and space.

Black (1976) proposes that the amount of law varies directly with the amount of organization within a society. For example, during a war, law tends to increase because the society going to war becomes more organized and centralized. During a war, the capacity for collective action increases because central decision-making and planning also increases. Social disorganization theories also propose that areas with high instability and low organization are more criminalized because of their disorganization (Shaw & McKay, 1942). Therefore, organized societies will have more law, while less organized societies will have less law.

Social Control

Social control is the normative aspect of social life; it defines what is considered deviant and what is not (Black, 1976). Law is one form of social control, but there are also many others such as etiquette, family, closed-circuit television systems, and ethics. Different forms of social control vary across time and space; different cities, countries, years, and centuries have had distinct forms of social control.

Black (1976) proposes a simple hypothesis for the relationship between social control and law: where other forms of social control are weaker, there will be more law. For example, in a country or state where social controls are weak (eg. prevalence of single-parent families), there will be a greater presence of law for those who are offenders and a lesser presence of law for victims. More specifically, in neighbourhoods where social controls are low or absent, the quantity of law will be greater for a murderer; however, the quantity of law will be less for a victim who resides in a neighbourhood of low social control.

Empirical Research

The empirical research testing Black's (1976) theory of the behaviour of law uses several different proxy variables to estimate the different aspects of social life in Black's theory. The variables included in these studies pertain to characteristics of the victim with the assumption that if these variables are significant in predicting clearance, then there is support for one or more of Black's aspects of social life.

Although there are five variables Black (1976) uses in his theory, the majority of research has generally focused on age, gender, and race as measures for discretionary factors in homicide clearance. There have been attempts to use economic variables to approximate Black's stratification concept in studies of homicide clearance, but these have resulted in methodological issues and/or non-significance. Litwin (2004) used victim-level data in Chicago from 1989 to 1991 to estimate homicide clearance rates using both discretionary and non-discretionary categories. Litwin (2004) attempted to include median area income, unemployment rates, and homeowner rates as proxies for stratification, morphology, and organization, respectively; however, serious multicollinearity effects prevented these variables from inclusion in the final

analysis. The results from this study indicated that females and Black individual were non-significant in predicting clearance, but Latino victims were 2.5 times less likely to have their cases cleared (Litwin, 2004). Age was also significant, with younger victims having their cases cleared more often (Litwin, 2004).

Xu (2008) used two longitudinal methods and both individual and community-level variables to examine homicide characteristics and the declining homicide clearances from 1965 to 1995 in Chicago. Xu (2008) included median household income, percentage of owner occupied housing, and percentage of vacant housing units in the analysis to predict homicide clearances and found that, when controlling for time, these variables did not have an effect on the decreasing clearance rate. Puckett and Lundman (2003) were also able to include levels of income as indicated in the census in their analysis of homicide clearances using Columbus, Ohio data from 1984-1992; however, it was also noted by Puckett and Lundman (2003) that these variables have been consistently omitted from previous research because of their non-significance in predicting homicide clearance. In this study, homicides were split into two categories: slam-dunks and whodunits (Puckett & Lundman, 2003). Slam-dunks were cases where there was little to no detective work involved, and whodunits were the other cases that required much more detective work. Puckett and Lundman (2003) did not find that the census-track measures of income and social location of the murder were significant in predicting clearance rates. On the other hand, Corsianos (2003) proposed that income and affluence of the victim played an important role in determining whether a case became 'high profile' or not.

The vast majority of studies that have examined discretionary variables have only included age, gender, and race due to problems with other discretionary variables outlined above.

The age variable tends to have the most reliable results across several studies, such that homicides with younger victims are solved more often and quicker (Alderden & Lavery, 2007; Puckett & Lundman, 2003; Regoeczi et al., 2008). Puckett and Lundman (2003) found that victims aged 0-14 were more likely to have their cases cleared when compared to ages 15-64. Regoeczi et al (2008) also found that very young victims have their cases cleared quicker, using both a continuous measure (days until clearance) and dichotomous (cleared or not) measure of homicide clearance from 1996-2002. Recoeczi et al (2000) used the NIBRS (National Incident Based Reporting System) dataset, which is not yet a nationally representative dataset, to obtain their results, therefore interpretation is not reliable. Xu (2008), on the other hand, found that the age variable was non-significant in their study of Chicago homicides in 1965 to 1995, which was not a nationally representative study and cannot be generalized to present day clearance rates.

The gender variable tends to have somewhat reliable results in the empirical literature, however, once non-discretionary variables are included in most models, the variable usually becomes non-significant (Roberts, 2011). The studies that find significant gender effects have reliably concluded that women victims are more likely to have their cases cleared (Addington, 2008; Alderden & Lavery, 2007; Regoeczi et al., 2000; Roberts, 2011). Addington (2008) used NIBRS data from 2000-2002 to measure how quickly murders are cleared, and if they are cleared at all for a number of variables. Female and white victims were the most salient factor in same-day clearances, and were also strong predictors of clearance in general (Addington, 2008). These results are contrary to Black's hypotheses that females have less social status and should receive less law, however this study used NIBRS data that is not representative as of yet, and only two years of data were analyzed. There are also several studies that have not supported gender as a

predictor of homicide clearance (Puckett & Lundman, 2003; Litwin, 2004; Trussler, 2010). The inconsistent findings of the gender variable may be because of its correlation with the victim-offender relationship. It is well-known in the literature that women are more likely to be murdered by a non-stranger, and men are more likely to be murdered by a stranger; therefore, studies that include both gender and victim-offender relationship in their models may be disguising one variable with the other (Kellerman & Mercy, 1992).

The race/ethnicity variables also produce inconsistent results when they are predictors of homicide clearance. The general trend indicates that White victims tend to have higher clearance rates when compared with "non-white" victims (Addington, 2008; Lee, 2005; Regoeczi et al., 2000, 2008). Studies that examine trichotomous or polytomous measures of race/ethnicity have more complicated results. Roberts (2011) conducted an event history analysis using a continuous measure of time to clearance as the dependent variable for homicides using NIBRS data. Roberts (2011) included a trichotomous variable consisting of non-Hispanic white, non-Hispanic black, and Hispanic to predict homicide clearances and found Hispanic victims were less likely to have their homicides solved, and little difference between Black and White victims. Alderden and Lavery (2007) only found that Hispanic victims were less likely to be cleared compared to white victims, and there was no difference between White and Black victims. The pattern of results suggests that the Hispanic ethnicity represents a more modern minority group, in comparison to the Black population, and that language barriers between Hispanics and the police make it more difficult to clear those homicides (Litwin, 2004).

As stated previously, the discretionary variables that have been empirically tested mostly focus on age, gender, and race. It is clear that the age variable has the most reliable results;

however, gender and race need further study to elucidate what role, if any, they play in homicide clearance rates.

2.2 Non-Discretionary Factors

Theoretical Framework

Several scholars have contested the principles and hypotheses of Black's theory of law for homicide clearances in favour of non-discretionary factors predicting the solvability of a crime (Gottfredson & Hindelang, 1979; Klinger, 1997; Wolfgang, 1958). Non-discretionary factors are those that pertain to characteristic of the homicide event itself, such as geographic location and police workload. The non-discretionary perspective assumes that police officers work to solve homicide with maximum effort, although the same effort may not be put forth with other, less serious crimes (Riedel, 2008).

Gottfredson and Hindelang (1979) propose an alternative model to Black's theory of law (1976) that suggests that the behaviour of law is determined primarily by what happens between the victim and offender; in other words, the seriousness of the crime is the principal predictor of the quantity of law (Gottfredson & Hindelang, 1979). Black (1976) proposes that the behaviour of law is based upon stratification, morphology, culture, organization, and social control; on the other hand, Gottfredson and Hindelang (1976) argue that the harm to the victim, or the seriousness of the offense, is what determines the behaviour of law. For example, the response of the law will be stronger for a crime rated higher in seriousness, such as rape, than a crime rated less serious, such as theft, regardless of the area in which the crime occurred.

The seriousness of a crime is defined as the individual consequences of law-breaking, or the individual harm to the victim (Gottfredson & Hindelang, 1979). Gottfredson and Hindelang

(1979) used Black's (1976) suggestion for measuring the quantity of law as their dependent variable: a complaint to the police. Black (1976) states that the principle measurement of the quantity of law is the initiation of contact with legal authorities: a complaint is more law than no complaint. The Gottfredson and Hindelang (1979) study focused on personal crimes where there is some form of contact between the victim and the offender, and a complaint to the police would begin the criminal justice process. The authors tested each of Black's (1976) predictions and found that any relationship between the independent variables and the number of complaints reported to the police was masked by the seriousness of the offense in question. Gottfredson and Hindelang (1979) found that Black's (1976) predictions were not supported with their evidence from the victimization survey data, and the authors instead found a much greater seriousness effect. The authors concluded that an adequate theory of criminal law must incorporate some aspect of the legal consequences that offenders will face when committing a particular crime. Gottfredson and Hindelang (1979) used police complaints to assess Black's predictions, however, other studies on arrest (Hindelang, 1974; Hagan, 1974), prosecution (Hagan, 1974), and sentencing (Hagan, 1974; Chiricos & Waldo, 1975) also confirm the result that the legal consequences of an infraction are primarily what determine the quantity of law that will be involved. Therefore, crimes that are the most serious, such as homicide will have the greatest quantity of law devoted to their occurrence. Police are expected to use all available means possible to solve all homicides, regardless of the characteristics of the victim.

Klinger (1997) proposes an ecological theory of police patrol work that also emphasizes non-discretionary factors as determinants of how vigorously police respond to crimes by making arrests, writing reports, and conducting investigations. For all crimes, Klinger (1997) uses

variables such as workload/resource constraints, level of deviance (per district), police cynicism,

and seriousness of crime to explain how diligently police work to solve a crime. Specifically

regarding homicide clearances, Klinger (1997) explains that the seriousness, frequency, and

visibility of homicide are most important for explaining why officers have the most incentive to

clear the case. Klinger (1997) states that police vigor, the diligence of the police in investigating

a crime, is always extremely high when investigating a homicide:

> "...no matter how busy the district, no matter how cynical the officers, no matter how
> routine the homicide, and no matter how undeserving the victim, the rule regarding
> murder in each and every district will be the same--all murders should receive highly
> vigorous police action by patrol officers."

Wellford and Cronin (1999) support Klinger's (1997) ecological theory of police patrol

work through their findings on factors that contributed to solving a homicide case. Wellford and

Cronin (1999) conducted preliminary analyses on 20 cities with relatively stable homicide

clearance rates from 1980-1994. Next, four cities were selected with the most consistently high

homicide rates and most stable clearance rates. Each city provided about 200 cases of homicide

data for further analysis. Results demonstrated that overwhelmingly, police practices and policies

were most significantly associated with clearing a homicide. In particular, the first responding

officer's initial duties on the crime scene, such as interviewing witnesses, securing the scene,

collecting evidence, were most important (Wellford & Cronin, 1999). The victim's race and sex

were not shown to be significant in predicting a homicide clearance (Wellford & Cronin, 1999).

Wellford and Cronin (1999) provided an in-depth analysis into four cities and their patterns of

homicide clearance; however, the results cannot be generalized beyond those four cities, as they

were chosen because of their high homicide rates. Therefore, patterns occurring in these four

cities may not be representative of the greater population because of their high rates,

Other non-discretionary variables were used in Wolfgang's (1958) analysis of factors affecting homicide clearance. Wolfgang (1958) evaluated criminal homicide within the Philadelphia community using bivariate tables to establish relationships between variables and unsolved homicides, and found a number of conclusions that support non-discretionary factors in their predictions of clearance rates. For the race variable, it was concluded that the police work just as hard to solve homicides regardless of the race of the offender; however, white individuals were most likely to be victims of unsolved homicides--which is contrary to Black's (1976) hypotheses (Wolfgang, 1958). There was also no gender effect for unsolved homicides in the data. There was an age effect, in that older individuals were more likely to belong to the unsolved category; however, most of the patterns emerged from other variables (Wolfgang, 1958). Motives for robbery, beating deaths, weekend homicides, and homicides outside of the home were more likely to be unsolved (Wolfgang, 1958). Wolfgang (1958) explains that these characteristics of the homicide event were less likely to be cleared because of a lack of forensic evidence and witnesses to the crime.

The non-discretionary factors mentioned above and the theoretical criticism of Black (1976) forms an alternative theoretical model in explaining clearance rates. This model gives primacy to legal factors in the explanation of clearance rates. These factors are characteristic of the crime itself and do not reference extra legal factors like those set out in Black's theory of law.

Empirical Evidence

There have been several studies that include non-discretionary factors as predictors of clearance rates. These studies are not easily comparable because of the variation in how non-

discretionary factors are identified and operationalized; however, the results of those studies still inform the present paper and its use of non-discretionary variables to predict homicide clearance.

Prior research has suggested that the victim-offender relationship is a major factor in the solvability of a homicide; however, as discussed in the previous section, the victim-offender relationship and gender variables are too similar to separately include in the same model (Rinehart, 1994; Regoeczi et al, 2000). Another reason for the exclusion of the victim-offender relationship variable is the large amount of missing values for this variable. The nature of examining unsolved homicides includes the presence of an unknown offender, therefore, an unknown relationship between the victim and offender. Therefore, including a victim-offender variable would be unreliable because the majority of cases would involve missing data, as well as possible multicollinearity effects with the gender variable.

The presence or absence of a weapon, and the type of weapon used on the victim is a well-cited variable that can influence the clearance rate of a homicide. Litwin (2004) explains that firearms allow an offender to murder a victim at a greater distance, thereby reducing the amount of physical evidence (such as hair or fingerprints) left at the scene. This could lower the chances that a homicide will be cleared because there is less evidence due to the presence of a firearm. In addition, if a firearm is unregistered, which in homicide cases might be the majority, then solving a homicide would be even less likely. Several studies found that weapons other than firearms, were significantly related to higher homicide clearances because of the additional forensic evidence produced by using other weapons (Addington, 2006, 2008; Litwin, 2004; Litwin & Xu, 2007; Regoeczi et al. 2000, 2008; Roberts, 2007).

The workload of police officers is another contributing factor to the homicide clearance rate. On the one hand, Borg and Parker (2001) used 1990 census data and UCR data to measure Black's theory of law variables and found that lower homicide rates predict higher homicide clearances, even when police resourcing budget has been controlled. Another study used three data sources to examine crime clearance in Quebec in 1998 and found a small significant effect of workload for misdemeanor offenses, but not property or violent offenses, meaning that overworked police are more likely to ignore petty crimes (Pare et al, 2007). However, there was no effect of workload for major crimes, such as homicide. Therefore, police were able to work diligently to solve homicides regardless of their workload at the time. Puckett and Lundman (2003) estimated workload using a different method, the Homicide Number, a simple count of each homicide occurring that year, to predict whether it influenced whether a homicide was cleared or not, and they not find a significant effect of workload on clearance rate, which they noted as surprising considering the previous research that suggests a negative relationship between the two variables. Several other studies also did not find that workload affected the clearance rate for police (Keel et al., 2009; Litwin & Xu, 2007; Pare et al., 2007; Wong, 2010).

The population of a jurisdiction is another non-discretionary variable that has been argued to have an effect on homicide clearance rates. Trussler (2010) explains that population density is important to include in an analysis of clearance rates because bigger cities provide more anonymity for offenders and more contact with strangers for those subject to crimes. Consistent with the above hypothesis, Pare et al. (2007) found that community size was negatively associated with crime clearance; however Litwin (2004) found no relation between area population and homicide clearance. Litwin and Xu (2007) found that for 1966-1985 there

was a significant negative relationship between area population and clearance; however, this relationship became non-significant in the 1986-1995 time period. Clearly, there are inconsistencies surround the population variable, and its inclusion in the present study will hope to provide clarification.

The geographic location of homicides and their clearance rates is another factor that has been somewhat lacking in previous research. Geographic region is a rarely studied variable in the literature with mixed results; however its theoretical importance should be noted. The cultural and historical characteristics of a region can affect the homicide clearance rates for that area. Borg and Parker (2001) in their analysis of homicide clearance in 1990 used a dummy variable to indicate a southern state and found no significant difference when comparing to all other regions in the United States. Felson and Pare (2010) used a nationally representative sample of the United States to examine Southern and Western gun cultures. States in the west and south were more likely to carry firearms, which could contribute to a lower clearance rate if there is more gun violence. On the other hand, violence in the south and west are more prevalent in general because of the early settlement patterns and herding culture that normalized the use of violence in confrontations (Felson and Pare, 2010). Similar to the population size variable, the present paper will include geographic region to examine cultural and historical influences (if any) on homicide clearance rate.

Clearance Rates over Time

The measure of independent variables and their relationship with homicide clearance rates has been almost exclusively studied using single year or limited time frame estimates. Although these studies provide meaningful information, the dynamic relationship between these variables and clearance are missed when using single-year or limited time periods for analysis, and when time-variant dependent variables are excluded from analysis (Litwin, 2004). True longitudinal models are those that include: the data collected for the same variables are measured more than once, and the same cases are analyzed from one period to the next (Menard, 1991). The first of these two criteria can be satisfied, however the second is difficult with homicide clearance research. The nature of homicide data is that there are different cases every year and a victim can only die once; therefore, there is no reason to follow the same cases over several years to determine what factors influence its clearance. Xu (2008) provide the only known research that uses data over 30 years (1965-1995) where each of three models analyzes the data over 10 years in a cross-sectional manner. This paper satisfies the first criteria by Menard (1991), but not the second. Most research does satisfy the first criteria, but using limited years of data as outlined above. The current study will contribute to the research by satisfying the first criteria by using a large time period of data collection that is more recent and on a national scale.

2.3 The current study

The present paper will analyze the national clearance rates using the FBI's Supplementary Homicide Report (SHR) from the years 1984-2009. Figure 1 displays the preliminary analysis of clearance rates over this time period using the SHR and confirms the downward trend of clearance rates as other authors have found. More interestingly, an increasing

trend of clearance rates beginning in 2004 was observed that no other research has yet

documented, as this is the most recent data used in a multi-year study. The upward trend was

found to be significant using a regression analysis and therefore will be analyzed separately from

the downward trend observed from 1984-2003. This upward trend in clearance rates can have

interesting information on why the clearance rates are increasing and provide insight into the

more recent nature of homicide.

Figure 1. Homicide clearance rates over time.
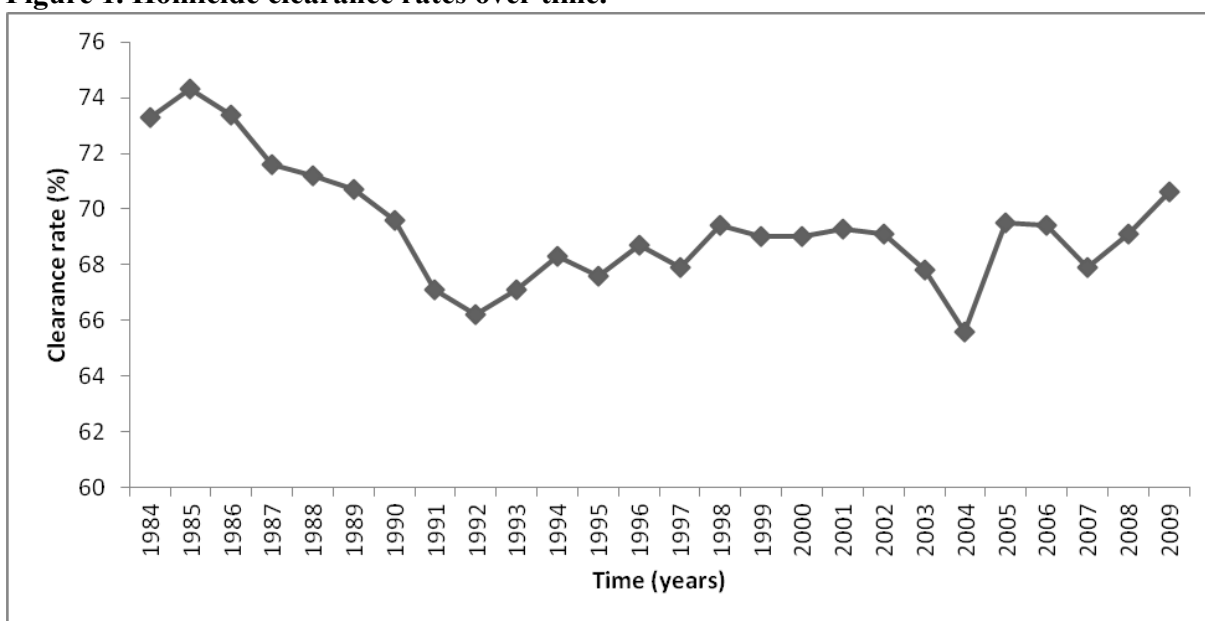
To assess the relationship between the two competing theories, the hypotheses for

discretionary and non-discretionary variables are outlined below.

Younger victims are more likely to have their cases cleared, in comparison to older

victims, and women are more likely to have their cases cleared than men. White victims will

have higher clearance likelihood, whereas Black victims and victims of other races (Asian,

Pacific Islander, American Indian or Alaskan Native) will be less likely to have their cases

cleared.

The presence of a firearm at a homicide will decrease the likelihood that the homicide will be cleared, whereas the presence of other weapons will increase the likelihood of clearance. The occurrence of homicides in the south and west will decrease the likelihood that a homicide will be cleared because of the presence of gun cultures. The size of the community in which a homicide occurs will be negatively related to clearance; homicides in larger communities will be less likely to be cleared. If police have a high workload, this is expected to decrease the clearance rates as police will have less time to devote to cases, and if there is a lower workload, than homicide clearance will increase.

Chapter 3: Research methodology and analytic technique

3.1. FBI Uniform Crime Reporting Program: Supplementary Homicide Reports

Data are collected from the yearly FBI's Uniform Crime Reporting Program Data: Supplementary Homicide Reports (SHR) from 1984 through to 2009. The use of data from the past twenty-five years will allow for patterns to emerge over time that could not have been achieved if a shorter time span were utilized. This is the first known study to use yearly data for more than 20 years, and to use data from more recent time periods. As mentioned earlier, Xu (2008) used 30 years of data for their study; however the latest year was only 1995. The current study will use a large yearly dataset that will cover until the most recent SHR year, which is 2009. The datasets are located through the Inter-University Consortium for Political and Social Research (ICPSR) which is funded by the United States Department of Justice.

The Uniform Crime Reporting Program has been in effect since 1930 and has allowed the FBI to collect yearly nationwide assessments of reported crimes. The data in the Uniform Crime Reporting Program (UCR) are voluntarily submitted by each county involved in the dataset each month through a self-enumerated questionnaire. The Supplementary Homicide Reports (SHR) includes information on criminal homicides that are reported to the police, such as victim-offender relationship, details the offender and the victim, as well as information on the homicide itself (FBI, 2009). The homicides reported in the SHR include murders, non-negligent killings, and justifiable homicides. The unit of analysis for the dataset is the specific incidence of homicide that can include up to eleven offenders per incident (FBI, 2009). Therefore the information on victims, offenders, circumstances…etc are provided by incident. For the present study only incidents involving one offender and one victim will be used.

The SHR is a database that is historically known as the best source of homicide data that is available to the public (Brown et al., 1999). The more recent National Incident-Based Reporting System (NIBRS) database is becoming more popular, but was not used for this study for two reasons. First, the database is still in its infancy and is not a nationally representative dataset, with only 20% of the U.S. population represented (Regoeczi et al., 2008). Second, the NIBRS database has not been in place as long as SHR, and the present analysis needs reliable data from the past twenty-five years. The national scope of the SHR dataset is extremely valuable for observing trends in homicide for the present paper.

Despite its widespread use, there are some limitations inherent in the data. The SHR collects data from various police forces that voluntarily submit data to the program each month. The nature of such voluntary data can result in underreporting and missing cases. Wiersma, Loftin, and McDowell (2000) noted missing data in the reports as primarily attributable to law enforcement agencies failing to submit their monthly reports. Another source of missing data arises from the definition of homicide as a state-enforced crime. In other words, homicides in the military, Indian reservations and federal prisons are not included in the dataset (Brown et al., 1999). A further limitation of SHR data is the single coding of relationships in cases where there are multiple offenders and/or multiple victims. The dataset does not record multiple relationships between victim and offender in a single homicide event (Brown et al., 1999). This limitation can underestimate the levels of stranger or non-stranger homicide within the dataset if there are multiple offenders and/or multiple victims involved.

3.2. Variables

Independent variables for the present study include both discretionary and non-discretionary factors. Discretionary variables include age of the victim, gender of the victim, and race of the victim. Non-discretionary variables include police workload, population size, geographic region and weapon type. Time is also an independent variable, as this is the most important variable that will demonstrate any mediating or suppressing effects of the other independent variables. The clearance rates show a downward trend from 1984 to 2003, then an upward trend from 2004-2009. The time variable will be divided into "downward time" and "upward time" to capture the two slopes.

The age variable is re-coded, where necessary, to include 1 to 99 years old. Sex is re-coded as 1 for male and 0 for female. Race is recoded into "White", "Black", and "other races" with "White" omitted as the reference category. Hispanic ethnicity is excluded from analysis because of inconsistent reporting throughout the dataset.

The police workload variable is approximated through the number of homicides committed for that particular year. If there are more homicides in a particular year, than clearance will be less likely because the police, as a national unit, will have a greater workload.

The type of weapon variable is recoded by collapsing the categories "firearm type not stated, handgun (pistol, revolver, etc), rifle, shotgun, other gun" into one variable that is called "firearm" where 1 equals the presence of a firearm, and 0 equals the absence of a firearm. The use of a knife, blunt object, personal weapon (teeth, nails), poison, pushed or thrown out window, explosives, fire, narcotics, drowning, strangulation, and asphyxiation are all collapsed into another variable called "other weapon" and is used as the reference category. The "unknown

weapon" category is used as a separate variable and coded as 1 for unknown weapon, and 0 for when the weapon is known to the police. A weapon may not be known in a homicide situation if the police officer could not find a weapon, or the police simply did not know how the victim was murdered; for example, if a victim's bones were found or with body parts missing. This categorization of the firearm variable into "firearm", "other weapon", and "unknown firearm" is consistent with previous research that investigates weapon use and its influences on clearance rates (Regoeczi et al, 2000).

Geographic region is collapsed into three categories representing the north, west, and south of the United States. The "north" variable consists of the New England States, the middle Atlantic States, the East North central states and the West North central states. The "west" variable consists of the mountain states and the Pacific states. The "south" variable consists of the South Atlantic states, the East South central states, and the West South central states. This grouping for the states into three categories was also used by Felson and Pare (2010). The "north" variable is used as the reference category.

The dependent variable is whether a homicide is cleared or not. The definition of "cleared" is if an arrest is made. The literature is fairly consistent in using this definition when referring to a "cleared" case (Puckett & Lundman, 2003; Litwin, 2004). The variable is called "cleared" and is coded as cleared=1 and not cleared= 0. If a homicide is not cleared, then it will be assumed the offender is still being pursued by the police (Litwin & Xu, 2007). The literature has been less consistent with the treatment of exceptionally cleared cases, which are a less common means of clearance. These special cases occur when the offender is dead (due to suicide or other means) or the offender confesses to the murder while incarcerated for another offense. In

either scenario, the offender is not arrested; however the case is still recorded as "cleared" by the police. Exceptional clearances have been included in the dependent measure of clearance rates by some researchers (Puckett & Lundman, 2003; Litwin & Xu, 2007) and excluded by others (Litwin, 2004). The present study is using the "situation of offense" variable to approximate the cleared vs. uncleared cases of homicide. This variable does not identify whether a case was exceptionally cleared or not.

The Supplementary Homicide Report (SHR) does not provide a separate variable for those homicides that have been cleared; therefore, a re-coding of the "situation of offense" provides an indicator for what offenses have been cleared. This technique was also used by Regoeczi et al (2000) in their analysis of the SHR for American homicides. The "situation of offense" variable includes the categories: single victim/single offender, single victim/unknown offender(s), single victim/multiple offenders, multiple victims/single offender, multiple victims/ multiple offenders, and multiple victims/unknown offender(s). For the present study, it is assumed that a single victim/unknown offender category constitutes an unsolved crime, and therefore coded as "not cleared", because the offender is unknown and therefore unable to be arrested. The categories of "single victim/single offender" and "single victim/multiple offenders" are collapsed into the "cleared" category because the offenders are known to the police and able to be arrested. The present study only utilizes those situations where there is a single victim to avoid duplicate data on victims that may overestimate patterns found in the results.

3.3. Analytic technique

The data from the FBI's SHR will be analyzed using SPSS software. Binary logistic regression will be used to analyze the independent variables and how they are able to predict

whether a crime is cleared or not. This statistical method is most appropriate because the

dependent variable is a discrete event (whether a crime was solved or not) and the independent

variables are both interval and categorical. Clearance rates will be examined over time in order to

see how the independent variables are predicting the declining rates. This technique also

provides odds ratios for the likelihood of a homicide being cleared. Variables will be inserted

into the equation separately in order to clearly examine the impact of each independent variable

on the dependent variable. The regression equation for both upward and downward time trends

will be:

Odds (cleared or not) = b0 +b1 (downward or upward time) + b2(age) + b3(male) + b4(black) + b5(other race) + b6(firearm presence) + b7(unknown weapon) + b8(west) + b9(south) + b10(log10 workload) + b11(log10 population size) + e(random error)

This equation will answer my research question of what variables explain both the

downward and upward trends in homicide clearance rates using both discretionary and non-

discretionary factors. The following section will provide descriptive, bivariate and multivariate

results for the data.

Chapter 4: Results

4.1. Descriptive statistics

Downward Trend

In Table 1, descriptive statistics are presented for the downward trend from years

1984-2003. Information for all 355,537 homicides is given for each independent variable and the

dependent variable. The clearance rates go from 73.3% in 1984 to 67.8% in 2003, with an

average clearance rate of 69.3% (n=246,437) for all years included. The percentage of male

victims is 78.1% (n=277,638), which is consistent with previous research on victimization and

gender (Gartner et al, 1990). The percentage of White victims is 48.5% (n=172,320), Black

victims is 48.2% (n=171,285), and other race victims is 2.6% (n=9307). The mean age of victims

is 32.46, which is slightly older than other reports on average victimization age (Fox & Zawitz,

2007). The percentage of homicides involving a firearm is 65.2% (n=231,679) and the

percentage of homicides in which there is an unknown weapon used is 4.8% (n=16990). The

geographic region variables indicate that 40.7% (n=144,731) of homicides occurred in the South,

34.9% (n=124,179) occurred in the North, and 24.4% (n=86,627) occurred in the West. The

logged number of homicides per year varies between 4.11 (12,792 homicides) and 4.36 (22,984

homicides). The logged population size varies between 0 (1 resident) and 6.91 (8,101,321

residents).

Upward Trend

In Table 2, the descriptive statistics are presented for the upward trend for the years

2004-2009. Information for all 84,005 homicides is given for each independent variable and the

dependent variable.The clearance rates go from 65.6% in 2004 to 70.6% in 2009, with an

average clearance rate of 68.7% (n=57,678) for all years included in this trend. The percentage of

male victims is 79.4% (n=66,706). The percentage of White victims is 47.4% (n=39,822), Black

victims is 48.2%

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Table 1. Descriptive Statistics- Downward Trend (1984-2003) (N= 355,537).

	(%)	**Correlation between variables and time**
Dependent Variable		
Clearance		
Yes	69.3	-.034**
No	30.7	
Independent Variables		
Discretionary Variables		
Gender of victim		
Male	78.1	.010**
Race of victim		
White	48.5	-.028**
Black	48.2	.013**
Other race	2.6	.042**
Age of victim		
Mean age	32.45	-.021**
Non-discretionary Variables		
Weapon Use		
Firearm	65.2	.042**
Other weapon	30.0	-.065**
Unknown weapon	4.8	.047**
Region		
North	34.9	.003
West	24.4	.027**
South	40.7	-.026**
Workload		
Mean homicide count	18,131.38	-.542**
Population		
Mean population size	1,106,569.08	-.034**

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*p<.05; **p<.01

(n=40,457), and other races is 3.7% (n=3122). The mean age of victims is 33.29. The percentage

of homicides involving a firearm is 67.2% (n=56,474) and the percentage involving an unknown

weapon is 6.8% (n=5740). The geographic region variables indicate that 39.7% (n=33,315) of

homicides occurred in the South, 34.6% (n=29,086) of homicides occurred in the North, and

25.7% (n=21,604) of homicides occurred in the West. The logged number of homicides per year

varies between 4.14 (13,858 homicides) and 4.18 (15,076 homicides). The logged population

size varies between 0 (1 resident) and 6.92 (8,400,907 residents).

4.2. Bivariate analyses

Tabular analyses are presented in Table 2 for each variable and its correlation with both

the downward trend (years 1984-2003) and the upward trend (years 2004-2009).

Downward trend correlations indicate that the number of cleared homicides has

decreased as the years increase ($r = -.034$, $p < .01$), and the number of homicides that occur per

year decrease as the years increase ($r = -.542$, $p < .01$). The number of male victims slightly

increased during the downward trend years ($r = .010$, $p < .01$), and the mean age of victims

slightly decreased as well ($r = -.021$, $p < .01$). The number of White victims decreased ($r = -.028$,

$p < .01$), the number of Black victims increased ($r = .013$, $p < .01$), and victims of other races

also increased ($r = .042$, $p < .01$). Homicides involving firearms increased during the downward

trend ($r = .042$, $p < .01$), however the number of homicides where no weapon could be identified

also increased ($r = .047$, $p < .01$). The geographic region of the west experienced more homicides

during this time ($r = .027$, $p < .01$), the north did not change ($r = .003$, *ns)*, and the south

experienced fewer homicides ($r = -.026$, $p < .01$).

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Table 2. Descriptive Results- Upward Trend (2004-2009) (N= 84,005).

	(%)	Correlation between variables and time
Dependent Variable		
Clearance		
Yes	68.7	.023**
No	31.3	
Independent Variables		
Discretionary Variables		
Gender of victim		
Male	79.4	.018**
Race of victim		
White	47.4	.005
Black	48.2	.018**
Other race	3.7	-.005
Age of victim		
Mean age	33.29	.022**
Non-discretionary Variables		
Weapon Use		
Firearm	67.2	.001
Other weapon	26.0	-.005
Unknown weapon	6.8	.007
Region		
North	34.6	.001
West	25.7	-.028**
South	39.7	.024**
Workload		
Mean homicide count	14,583.81	-.398**
Population		
Mean population size	886,801.97	-.016**

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*p<.05; **p<.01

Upward trend correlations indicate that the number of cleared homicides has increased throughout the time period of 2004-2009 ($r = .023$, $p < .01$), and the number of homicides that occur per year decreased as the years increased ($r = -.398$, $p < .01$). The number of male victims increased ($r = .018$, $p < .01$), and the mean age of victims increased as well ($r = .022$, $p < .01$).

The number of White victims did not change ($r = .005$, *ns)*, the number of Black victims increased ($r = .018$, $p < .01$), and the number of victims of other races did not change ($r = -.005$, *ns*). Homicides involving firearms did not change ($r = .001$, *ns*), and neither did the number of homicides where no weapon could be identified ($r = .007$, *ns*). The geographic region of the west experienced fewer homicides ($r = -.028$, $p < .01$), the north did not change ($r = .001$, *ns*), and the south experienced more homicides ($r = .024$, $p < .01$).

4.3. Multivariate analyses

Tables 3 and 4, which consist of four different models, present information on the multivariate analyses for both the downward and upward trends, respectively, for the variables hypothesized to contribute to clearance rates. The first models only include the time variables, the second models include only the discretionary variables, the third models include only the non-discretionary variables, and the final models include all the time, discretionary, and non-discretionary variables.

Downward Trend

Table 3 shows the change over time for clearance rates as indicated in Model 1 with a significant decrease in clearance rates for the 1984-2003 time period ($b = -.013$, $p < .01$). Model 2 tests discretionary factors with the inclusion of time, gender of victim, race of victim, and age of victim variables. The downward time trend is very slightly mediated by the effects of the discretionary variables, meaning these variables explain a very small part of the downward trend in homicide clearance ($b = -.012$, $p < .01$). Model 3 tests the non-discretionary variables with the inclusion of weapon use, region, workload, and population size variables. The downward time trend increased in magnitude with the inclusion of these variables, suggesting that non-

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Table 3. Logistic regression predicting clearance for downward trend (1984-2003)
(exponent _β_ in parentheses; N=355,537).

	Model 1	Model 2	Model 3	Model 4
Time				
Downward time	-.013**	-.012**	-.016**	-.016**
	(.987)	(.988)	(.984)	(.984)
Discretionary Variables				
Gender				
Male	-	-.318**	-	-.248**
		(.727)		(.781)
Race				
Black	-	-.300**	-	-.237**
		(.741)		(.789)
Other race	-	-.176**	-	-.104**
		(.839)		(.901)
Age				
Mean age	-	-.003**	-	-.006**
		(.997)		(.994)
Non-discretionary Variables				
Weapon Use				
Firearm	-	-	-.279**	-.249**
			(.757)	(.779)
Unknown weapon	-	-	-1.236**	-1.245**
			(.291)	(.288)
Region				
West	-	-	.023*	-.042**
			(1.023)	(.958)
South	-	-	.275**	.294**
			(1.316)	(1.342)
Workload				
Homicide count(log10)	-	-	-0.775**	-.785**
			(.461)	(.456)
Population				
Population size(log10)	-	-	-.390**	-.370**
			(.677)	(.691)

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*p<.05; **p<.01

discretionary variables are suppressing the effect of clearance rate over time (b = -.016, p < .01).

Therefore, the trend of declining clearance rates are even more pronounced than in the null

model with only downward time as the independent variable. Model 4 includes all time,

discretionary, and non-discretionary variables. The downward time variable remains the same as

Model 3, therefore the inclusion of discretionary variables provides no additional explanatory

power above the non-discretionary variables (b = -.016, p < .01). All variables in the final model

are significant because of the very large sample size; therefore, the exponential of β will be

interpreted to show relative importance among the independent variables.

Discretionary variables show moderate effect sizes when predicting clearance rates.

There is a negative relationship between age and clearance, meaning younger victims were more

likely to have their cases cleared (b = -.006, β = .994). For example, using the exponential of β

for age, a 20 year increase in the age of a victim will result in a 12% decrease in the likelihood of

their case being cleared. Male victims were also less likely to have their cases cleared in

comparison to females; more specifically, a male victim is 21.9% less likely to have his case

cleared than a female (b = -.248, β = .781). Black victims (b = -.237, β = .789) and victims of

other races (b = -.104, β = .901) were 21.1% and 9.9% less likely to have their cases cleared in

comparison to White victims. Non-discretionary variables had greater effect sizes when

predicting crime clearance than discretionary variables. Homicides that involved firearms were

22.1 % less likely to be cleared than homicides involving other weapons (such as blunt objects,

knives, etc.) (b = -.249, β = .779). Homicides in which a weapon was not found or identified

produced the most salient result in the model, such that homicides without an identifiable

weapon were 77.2% less likely to be solved than homicides involving other weapons (b = -1.245,

β = .288). Regional differences in homicides also had strong predictive ability for homicide

clearance. Homicides that occurred in the western region of the United States were 4.2% less

likely to be cleared (b = -.042, β = .958), and homicides that occurred in the southern region

were 34.2% more likely to be cleared in comparison to homicides in northern states (b = .294, β

= 1.342). The workload variable had a small negative relationship to homicide clearance,

meaning that in years of higher homicide rates, the probability of solving an individual homicide

is decreased (b = -.785, β = .456). For example, using the exponent β, a homicide occurring in a

year with 10% higher than average number of homicides in comparison to a year with the

average number of homicides, will be 29.2% less likely to be cleared. Although this appears to

reflect a large effect of workload, the predicted probabilities in table 5 demonstrate a small effect

for the downward trend, and no effect for the upward trend. The population size variable also has

a negative relationship with crime clearance (b = -.370, β = .691). For example, a homicide in a

city with population size 1,000,000 compared to a city with population size 100,000 will be

30.9% less likely to be cleared.

Upward Trend

Table 4 shows the change over time for clearance rates as indicated in Model 1 with a

significant increase in clearance rates for the 2004-2009 time period (b = .029, p < .01). Model 2

tests discretionary variables with the inclusion of time, gender of victim, race of victim, and age

of victim variables. The upward time trend is mediated by the effects of the discretionary

variables, meaning these variables explain a considerable amount of the upward trend for

homicide clearance (b = .010, p < .05). Model 3 tests the non-discretionary variables with the

inclusion of weapon use, region, workload, and population size variables. The upward time trend

increased in magnitude with the inclusion of these variables, suggesting that non-discretionary variables are suppressing the effect of clearance rate over time ($b = .035$, $p < .01$), which is the same pattern that was observed in the downward trend models. Therefore, the increasing clearance rates are even more pronounced than in the null model with only upward time as the independent variable. Model 4 includes all time, discretionary, and non-discretionary variables. The upward time variable is fully mediated by the effects of both discretionary and non-discretionary variables and is no longer significant ($b = .006$, *ns*). Because the upward time trend is completely mediated by the inclusion of all the variables, it is important to establish the importance of the variables relative to each other. However, similar to the downward trend final model, most of the explanatory variables are significant because of the large sample size; therefore, the exponential of β will be interpreted to show relative importance among the independent variables.

There is a negative relationship between age and clearance, meaning younger victims were more likely to have their cases cleared ($b = -.001$, $\beta = .999$); however, this effect is very small, such that a 20 year increase in age of a victim will only result in a 2% decrease in their case being cleared. Male victims were less likely to have their cases cleared in comparison to females with male victims being 42.2% less likely to have their case cleared ($b = -.548$, $\beta = .578$). Black victims ($b = -.431$, $\beta = .650$) and victims of other races ($b = -.238$, $\beta = .788$) were 35% and 21.2% less likely to have their cases cleared in comparison to White victims. Homicides that involved firearms were 51.0% less likely to be cleared than homicides involving other weapons (such as blunt objects, knives, etc.) ($b = -.713$, $\beta = .490$). Similar to the downward trend model, homicides in which a weapon was not found or identified produced the most salient

Table 4. Logistic regression predicting clearance for upward trend (2004-2009) (exponent *β* in parentheses; N=84,005).

	Model 1	**Model 2**	**Model 3**	**Model 4**
Time				
Upward time	.029**	.010*	.035**	.006
	(1.030)	(1.010)	(1.035)	(1.006)
Discretionary Variables				
Gender				
Male	-	-.710**	-	-.548**
		(.492)		(.578)
Race				
Black	-	-.463**	-	-.431**
		(.629)		(.650)
Other race	-	-.323**	-	-.238**
		(.724)		(.788)
Age				
Mean age	-	.003**	-	-.001*
		(1.003)		(.999)
Non-discretionary Variables				
Weapon Use				
Firearm	-	-	-.873**	-.713**
			(.417)	(.490)
Unknown weapon	-	-	-1.069**	-1.106**
			(.343)	(.331)
Region				
West	-	-	-.113**	-.270**
			(.893)	(.763)
South	-	-	.365**	.360**
			(1.440)	(1.433)
Workload				
Homicide count(log10)	-	-	2.593**	.104
			(13.374)	(1.110)
Population				
Population size(log10)	-	-	-.337**	-.291**
			(.714)	(.748)

*p<.05; **p<.01

results in the model, such that homicides without an identifiable weapon were 66.9% less likely

to be solved than homicides involving other weapons (b = -1.106, β = .331). Regional differences

in homicides had moderate predictive ability for homicide clearance. Homicides that occurred in

the western region of the United States were 23.7% less likely to be cleared (b = -.270, β = .763);

on the other hand, homicides that occurred in the southern region were 43.3% more likely to be

cleared in comparison to homicides in northern states (b = .360, β = 1.433). The workload

variable was the only non-significant variable in the model, aside from the upward time variable,

which means that the workload of the police did not have any effect on their ability to solve

homicides from 2004-2009 (b = .104, ns). The population size variable produced a negative

relationship with crime clearance (b = -.291, β = .748). For example, a homicide in a city with

population size 1,000,000 compared to a city with population size 100,000 will be 25.2% less

likely to be cleared.

      The downward trend final model was significant (χ^2=18519.80, 11 df, p<.001) with

Nagelkerke R^2=.073. The upward trend final model was also significant (χ^2=6524.86, 11 df, p<.

001) with Nagelkerke R^2=.106. The upward trend model is a better fit for the variables included

in the model, with 10.6% of the variation in homicide clearance being explained by the

independent variables, compared to only 7.3% of the variance in the downward trend model.

Predicted Probabilities

      While the exponential of β is important for providing information on the independent

variables relative to one another, it is also important to analyze the absolute values of the

independent variables for a clearer picture of the influence of each variable.

Table 5 shows the predicted probabilities for both the downward and upward trends, while averaging other interval variables and maintaining the reference group as White, female

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Table 5. Predicted probability of homicide clearance.

	Downward Trend	**Upward Trend**
Weapon Use		
Firearm	.747	.786
Unknown weapon	.522	.712
Other weapon	.791	.882
Workload		
High	.781	.882
Average	.791	.882
Low	.800	.882
Region		
North	.791	.882
West	.784	.851
South	.835	.915
Population Size		
High	.724	.847
Average	.791	.882
Low	.846	.909
Gender		
Male	.747	.812
Female	.791	.882
Race		
White	.791	.882
Black	.749	.829
Other race	.773	.855

_____

Note: Assuming mean levels and reference categories of female, White, and northern region on other variables.

victims in a northern region. Weapon variables and population size variables clearly show the most variation in predicted probabilities in both downward and upward trends. The probability of clearing a homicide with an unknown weapon compared to a firearm compared to other weapons

(knives, blunt object, strangulation...etc) is 52.2% vs. 74.7% vs. 79.1%, respectively. These probabilities change in the upward trend, although the pattern remains the same. The probability of clearing a homicide in a population size one standard deviation less than the average is 84.6%, clearing a homicide in an average population size is 79.1%, and clearing a homicide in a population size one standard deviation above the average is 72.4%. Again, these probabilities change in the upward trend, but the pattern remains the same.

Gender, race, and region variables show slight variation in their predicted probabilities in both the downward and upward trends. The probability of clearing a homicide with a female victim is 79.1%, compared to a male victim at 74.7% (this trend is slightly stronger in the upward model). The probability of clearing a homicide with a Black victim is 74.9%, compared to a victim of another race at 77.3%, compared to a White victim at 79.1% (this trend is similar in the upward model). Regional variables indicate a probability of clearing a homicide in the north is 79.1%, west is 78.4%, and south is 83.5% (this trend is also similar in the upward model). The workload and age variables do not show significant variation in their predicted probabilities.

Chapter 5: Discussion

      The study of homicide clearance rates from 1984-2009 has not only provided results that are consistent with previous research, but has also introduced newer findings and explanations. There were two goals of the current study. The first goal was to use nationally representative data over 25 years to obtain a better understanding of the two main theoretical approaches to homicide clearance (discretionary vs. non-discretionary theories). The second goal was to update the literature using the nationally representative sample and explain the upward trend in homicide clearances observed from 2004-2009.

      The results of the current study present a puzzle for homicide clearance rates. The upward trend was explained very well by the independent variables, showing good model fit and Nagelkerke R-squared; however, the downward trend was not explained as sufficiently with the same variables. The clearance rate in the upward trend is still not close to its levels in the 1960s, so there is more research to be conducted in this area. The ambiguity over why the homicide clearance rates decreased in the downward trend still exists as it was not fully captured in the current model. Some possible explanations for this ambiguity will be discussed below.

5.1. Discretionary and Non-Discretionary Factors

      The age variable yielded somewhat consistent results with previous literature in that younger victims were more likely to have their cases cleared (Alderden & Lavery, 2007; Puckett & Lundman, 2003; Regoeczi et al., 2008; Trussler, 2010); however, this was only present in the downward trend model. The upward trend model barely showed any influence of age in the increasing clearance rates between 2004-2009, similar to Xu (2008). The negative relationship of age and clearance could be a product of several explanations including, but not limited to

opportunity, association, and routine activities. Younger victims tend to have fewer opportunities to be victimized because they are not often associated with criminal or delinquent peers; however, adolescent victims tend to have more opportunities to be victimized (Clarke & Felson, 1993). Adolescent and early adults are more likely to engage with criminal peers and subsequently have more opportunities for victimization (Clarke & Felson, 1993). Because the likelihood of victimization is increased, there are greater homicides in this age group (Clarke & Felson, 1993). In comparison to older victims, younger victims of crime are rare due to their opportunity, association, and routine activities; therefore, a homicide of a young victim is rare and likely to attract media and public attention (Corsianos, 2003). The media/public attention that a young victim receives substantially increases police pressure to solve the case; in other words, younger victims will have their cases cleared quicker (Corsianos, 2003).

The gender variable produced results consistent with some previous research in that female victims were more likely to have their cases solved than male victims (Addington, 2008; Alderden & Lavery, 2007; Regoeczi et al., 2000; Trussler, 2010); however, unlike Roberts (2011), this trend remained significant with the addition of non-discretionary variables. The race variable produced results consistent with previous literature in that Black victims and victims of other races were less likely to have their cases cleared (Addington, 2008; Lee, 2005; Regoeczi et al., 2000, 2008), and this trend was more pronounced in the upward time model.

Non-discretionary variables were consistent with previous research, although some were more influential than others. The unknown weapon and firearm variables were the most salient results in both downward and upward models, and were in the direction consistent with previous research and the current hypotheses (Addington, 2006, 2008; Litwin, 2004; Litwin & Xu, 2007;

Regoeczi et al. 2000, 2008; Roberts, 2007; Trussler, 2010). Regional variations in homicide

clearance show an increase in clearance rate among southern regions in both models, which runs

contrary to previous research on southern gun cultures and the current hypotheses (Felson and

Pare, 2010). The workload variable does not explain much of the variation in clearance rates. In

the downward model, higher workloads are shown to slightly decrease the probability that a

homicide will be cleared; however, in the upward model, the trend is non-significant, which is

consistent with previous studies (Keel et al., 2009; Litwin & Xu, 2005; Pare et al., 2007; Wong,

2010). Homicide rates were relatively high during the 1980s, with the peak rate of 9.8/100,000 in

1991, and steadily declined afterwards (Blumstein et al., 2000). The effect of workload could be

explained by the heavy crime and homicide rates during the downward trend years, and the null

effect of workload in the upward trend could be a result of crime rates steadily decreasing in the

upward trend. The population size variable shows that homicides in areas of higher populations

were less likely to be cleared than those in lower populated areas, which clarifies the inconsistent

results of previous research and supports findings by Trussler (2010) and Pare et al (2007). The

main findings of the current study and their theoretical implications will be discussed below.

Weapon Variables

The weapon variables are clearly the most important in this analysis of homicide

clearance. The use of a firearm in a homicide generates less physical evidence because of the

distance created between the offender and victim. This is a practical explanation offered by

several other studies in which firearms were found to be negatively associated with homicide

clearance (Alderden & Lavery, 2007; Ouset & Lee, 2010; Puckett & Lundman, 2003; Trussler,

Figure 2. Homicide clearance rate with firearms and unknown weapon trends.
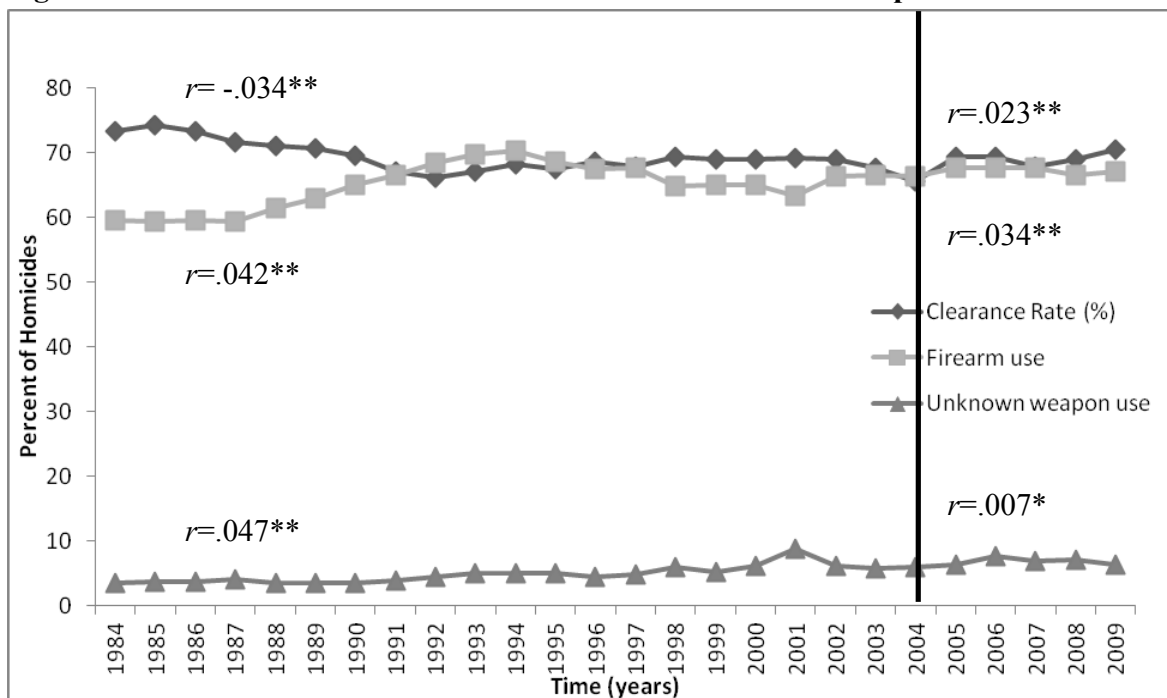
2010). Similar to Alderden and Lavery (2007), Figure 2 shows a significant positive relationship between time and firearm use during the downward trend, however there was no pattern when homicide clearance rates increase in the upward trend. The decrease in firearm use in the upward trend may explain why homicides are being solved more often in recent times. The same pattern is also observed in the highly significant unknown weapon variable. When weapons are unknown in a homicide investigation, it can severely inhibit solving the crime because detectives might not know how the victim was killed, there might be very little physical evidence, and there might be few, if any, witnesses to the crime to provide details on a weapon. Unknown weapons exhibit a high influence over clearance rates in both the upward and downward trends. Similar to the firearm variable, Figure 2 shows a significant positive relationship between unknown weapons and the downward trend, and no relationship between unknown weapons and the

upward trend. The decrease in the number of firearms and weapons that are unknown in homicides may be contributing to the upward trend of clearance rates from 2004-2009.

Region Variables

The regional variables indicate that homicides in southern states are more likely to be cleared than northern states, and homicides in western states are marginally less likely to be cleared than northern states in the downward trend, and even less likely in the upward trend.

Subculture of violence theory suggests that certain regions may foster an environment of retaliatory violence where settling conflict informally without help from the police is the norm (Wolfgang & Feracuti, 1967). The subculture of violence is typically associated with southern regions, where interpersonal violence is part of an honor culture (Pare and Felson, 2010). Because the honour culture is very prevalent in the south, violence between people who know each other is promoted, and these violent conflicts can often turn into homicides. Rice and Goldman (1994) found that not only are southerners more likely to murder out of an argument than individuals in other regions, but also they are more likely to murder someone they know. Thus, the higher likelihood of clearance in southern states could be attributed to the prevalence of homicides in which victims are more likely to know their offenders.

Population Size

The population size variable is another important predictor of homicide clearance rates; in both downward and upward trends, population size is negatively related to the likelihood of solving a homicide. This result is typical of other papers that include community size as a predictor of crime clearance (Pare et al., 2007; Trussler, 2010). One explanation for this finding that has been cited in the literature is that greater populations provide more anonymity for the

offenders, such that they are able to avoid detection by police (Pare et al., 2007; Trussler, 2010).

Another possible explanation is that smaller populations may have better relationships with their

local police departments; therefore the willingness of potential witnesses to come forward is

greater. For example, homicide investigation in smaller cities might produce more witnesses that

are willing to come forward because citizens are concerned about safety in their community. On

the other hand, homicides in large cities are more common and witnesses may not feel compelled

to invest their time in helping the police.

Gender Variable

The effects of gender on crime clearance are consistent with the literature in that female

victims are more likely to have their cases cleared than males. This can be explained by through

the general pattern of violence toward females, where female victims are more likely to know

their offender (Rennison & Welchans, 2000). Male victims, on the other hand, are subject to

more stranger homicides (Rennison & Welchans, 2000); therefore, a female victim of a homicide

has increased odds of having her case solved because she is more likely to know her offender and

police can more easily make an arrest. Rennison and Welchans (2000) report that in in 1976,

females and males were almost equal in their homicide victim rates of intimate partner violence,

but in 1998, female victims comprised 75% of homicide victims due to intimate partner violence

and this number slightly increased in 2000 (Rennison, 2003).

The gender and stranger vs. intimate homicide explanation holds true for both downward

and upward trends; however, the upward trend shows an even stronger effect of female victims

increased clearance rates. One possible explanation is that there are more female victims of

homicide during the 2004-2009 period, however this is not shown in the bivariate correlations (in

fact, there is a positive relationship between male victims and the upward time trend). Parker (1989) contends that intimate homicides occur more when economic deprivation is greater. Absolute and relative poverty approaches suggest that individuals may use violence as a release of frustration because of the current economic climate and their socio-economic position relative to others, especially an intimate partner (Parker, 1989). Because women are increasingly involved in the workplace, the relative poverty of male and female partners is equalizing and sometimes in favour of the female. The "blacklash" hypothesis addresses the increased potential for violence in these situations as females gain greater social status and threaten the traditional male dominance (Williams & Holmes, 1981). The volatile markets and the recession in the late 2000s may have an effect on intimate partner violence such that female victims are even more likely to be killed by someone they know than before.

Race Variables

The race variables show support for Black's theory of law in that Black victims and victims of other races are less likely to have their homicides cleared. Black's (1976) explanation for such findings would center around the devaluation of non-White victims that would subsequently receive less law. This might explain some of the variation in clearance rates among minority victims, however there are also other explanations to consider.

Another explanation for these findings in other studies includes the general mistrust of police and the criminal justice system by minority populations (Alderden & Lavery, 2007; Keel et al, 2009). Witnesses may not be willing to come forward because of cultural differences and negative perceptions of the police. Because the presence of cooperative witnesses at a homicide are important for solving the crime (Wellford & Cronin, 1999), the absence of cooperative

witnesses may impede the investigation and lessen the chances of clearance. Wellford and Cronin (1999) also found that neighbourhood witnesses to a homicide, if cooperative, compared to friends of the victim, increased the chances that a homicide would be cleared.

Gang membership among minority individuals is another alternative explanation for lower clearance rates among minority victims. The typical profile of gangs are disproportionately composed of ethnic and racial minority youth (Esbensen & Winfree, 1998) and gang activity typically involves selling drugs, prostitution, and inter-gang violence, which severely increases victimization of gang members. Several studies suggest that gang-related homicides are less likely to be solved than expressive homicides or instrumental homicides because they involve strangers and illegal activity that would not be reported to police (Alderden & Lavery, 2007). Therefore, the overrepresentation of racial minorities in gangs increases their odds of murder because of these gangs, and in turn can decrease the likelihood that their homicides will be cleared by police.

5.2. General Evidence of Professional Policing in Homicide Investigations.

The examination of homicide clearance rates mostly conflicts with Black's theory of law and discretionary theories, while showing more supports for non-discretionary theories of homicide clearance. While studies that provide theoretical support and criticism are useful, it is also important to examine the over-arching themes of homicide investigations with the intention for policy implications and practicality. Consistent with Klinger's (1997) ecological theory, a murder is a murder, and police will use all resources available to solve homicides. This is not to say there are not some questionable police discretions in some homicides, but the factors that tend to increase clearance rates are a practically significant part of homicide investigation.

One over-arching theme in this study is the relationship between the victim and offender. This variable is difficult to study directly because of missing information in unsolved murders, but it can be inferred from other variables that relate to homicide clearance. The victim-offender relationship can be dichotomized into stranger or non-stranger homicide. Innes (2002) in his qualitative study of police investigation in England and Whales first identified the pragmatic classifications of homicides by the detectives: "slam-dunk" and "whodunits". The "slam-dunk" cases were those where the victim knew their offender, and the "whodunits" were cases where the victim did not know their offender, which were much more difficult to solve (Innes, 2002). Puckett and Lundman (2003) also identified the "slam-dunk" and "whodunit" cases of homicide in their quantitative analysis of clearance rates and found this dichotomy to be more logical in the examination of discretionary vs. non-discretionary factors of homicide (Puckett & Lundman, 2003). The stranger vs. non-stranger, or "slam-dunk" vs. "whodunits", classification of homicides and their victims appears to be a simple and pragmatic method for explaining variation in homicide clearance rates.

Gender and homicide clearance is one relationship that can be explained through stranger and non-stranger homicides. Females are more likely to know their offender because of the prevalence of intimate partner violence, and are therefore easier homicides to solve for the police. In these situations, the first suspect is usually the victim's partner and there may be more physical and eyewitness evidence to support detective's suspicions. The stranger vs. non-stranger classification can also explain the age variable. Although not a major factor in homicide clearance in this paper, the downward trend shows that younger victims are more likely to have their homicides cleared. When a young child is murdered, it is probable that the offender

previously knew the victim. The southern region and the existence of the subculture of violence

is another result that can be explained by stranger vs. non-stranger homicide. The subculture of

violence suggests that southern individuals are more likely to respond to provocation with

violence (Wolfgang & Feracuti, 1967); therefore, the prevalence of interpersonal violence is

elevated. This type of violence is between persons who know each other, or non-strangers. If

violence that occurs in the south is typically between non-strangers, than it is more likely that

homicides in the south will be cleared.

The theme of stranger vs. non-stranger homicides is a practical explanation for many of

the findings in the present paper. Stranger vs. non-stranger violence focuses on whether the

victim knew their offender, rather than focusing on theoretical debates as to what determines

how police work to solve a murder. This theme has the potential to explain both discretionary

and non-discretionary variables, as shown above, and is an example of a more realistic approach

to homicide clearance rates. Innes (2002) notes multiple times that the detectives used pragmatic

approaches to homicide investigations and the ultimate goal is the search for the truth through a

standardized sequence of stages based on the classification of "slam-dunk" or "whodunit" cases.

It seems that a murder is a murder, and evidence is evidence; the investigation of homicide is a

search to uncover the truth.

5.3. Limitations and Future Directions

The current study focuses on national homicide clearance rates over time and the

predictors of both the downward and upward trend using discretionary and non-discretionary

factors. While large-sample studies are important for identifying general patterns, such as the

discovery of the upward trend, there are inherent limitations in the current work. The next section will focus on some limitations of the current paper and recommend future directions of research.

The FBI's SHR dataset used for this study, while nationally representative and available for the time period selected, does not provide all variables desired for analysis. As with many other datasets, not all variables can be used because of missing data. The ethnicity variable in the SHR is an example of a variable that had consistent reporting rates for only half of the years to be included in the present analysis; therefore, the variable had to be dropped because of missing data. Characteristics of the offender and the reporting police officers/detectives would also have been interesting variables to include; however, due to the nature of the SHR dataset, they could not be included. The missing data on the victim-offender relationship also contributes to the limitations in discussing the present results. The stranger vs. non-stranger relationship that appears to explain most of the independent variables is only inferred from the results because it was not directly examined in the study. The examination of whether a homicide was cleared or not does not permit the study of the victim-offender relationship for all homicides because the unsolved cases will not have this data. Therefore, these interpretations are based on inferences and not measured data. The benefits of using large-scale datasets like the SHR are noteworthy for the sample sizes obtained; however, consistency of reporting and missing data can often contribute to problems of variable inclusion and interpretation.

Related to the missing data limitation of large samples is the scope of large sample datasets. Again, while the benefits of using nationally representative data are many, the state-level or municipality-level trends are often glossed over in favour of more general results. For example, the dip in clearance rates in 2004 is left unexplained and could be a product of

administrative changes to the survey coding, non-response of a particular state, or a result of a major lack of clearance in a specific area. Reviewing FBI and Department of Justice reports reveals no indication of an administrative change or error during this year. The limitation of large sample sizes is only occurs when specific analyses are required, however the current paper focuses on general patterns and trends, and without the large-scale dataset, the clearance rates over time would not have been seen.

Future directions for the study of homicide clearance rates should focus on smaller-scale studies that analyze state or municipal-level data for more nuanced explanations. The majority of papers use national samples to find general patterns and trends; however, once these trends are known, it is logical to dive deeper into the patterns for more specific explanations. Homicide clearance rates are not the same in every region, as was seen in the current paper, so more research should focus on cities and even individual police departments. Other avenues for research could examine specific types of homicide and their clearance rate predictors, such as gang-related homicides or organized crime homicides. Corsianos (2003) and Innes (2002) provide in-depth and useful qualitative accounts of homicide investigations that allow for a more detailed picture of clearance rates. These papers should be used as models for future work to examine homicide investigations with the impetus of working with police departments to formalize best procedures and practices based on the evidence available.

Other suggestions for future research include building other models to explain the downward clearance rate trend that the current paper could only partially explain. Although the independent variables explained the upward trend, perhaps more research could elucidate the relatively low clearance rates from the 1980s to the early 2000s. Interaction effects of particular

variables and time could provide interesting explanations of the clearance rates. For example, interactions of race and gender with time could demonstrate how clearance rates vary over time at different categories of race or gender. Specifically for the race variable, as the criminal justice system introduces checks for equality of prosecution over time, the race variable may have an interaction effect. Another interaction effect that could be tested is between time and the weapon variables. Since the weapon variables were among the most important for explaining clearance rates, it would be valuable to examine clearance rates over time and different categories of firearms, other weapons, and unknown weapons. For example, a sudden increase or decrease in firearm usage during a specific time period may provide a more nuanced understanding of how this effects clearance rates.

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