POLICE EXPERIENCE AND DNA FORENSICS: IN CONCERT OR AT ODDS:
SEEKING PERFORMANCE IN THE 21ST CENTURY

By

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To the Faculty of Washington State University:

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Abstract

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This research focuses on the discourses and practices within the genetic forensic evidence and investigative process, specific to property crime scenes and the perspective of stakeholders within the investigative process. Using a mixed-methods approach, this research describes routine genetic forensic processing conducted within property crime scenes and the factors that influence the decision to process such evidence.
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CHAPTER ONE
INTRODUCTION

Horvath et al. (2001) assert, "In many fundamental respects, the police criminal investigation process has remained relatively unaffected by the significant changes that have occurred in policing, the crime problem and technology in the past thirty years" (p. 108). With such advances within technology, particularly within forensic DNA analysis, can it be said that following 10-years from this study, the investigative process is still relatively unaffected by the inclusion of forensic evidence? Likewise, if agencies have come to embrace DNA forensics as a routine element within the investigative process, what informs their decisions to process such evidence, specific to property crime scenes?

This dissertation focuses on the discourses and practices within forensic evidence and the investigative process, specific to property crime scenes. The topic was selected because while forensic evidence has proven invaluable to the investigative process and has slowly become one of the most highly funded sources of evidence, taking a central role within all levels of the criminal justice system, little is known concerning the factors to collect such evidence recovered at crime scenes. Currently, research has expressed the value of forensic DNA evidence and its subsequent utilization has proven a considerable source of research for both practitioners, and scholars, who have conducted rigorous quantitative studies and enthralling qualitative assessments (see. Dunsmuir et al., 2008; Roman et al., 2008; Briody, 2005; Home Office, 2005; Lovrich, et al., 2004; Walsh, 2002). In addition, throughout all of the scholarship within forensic evidence, one specific finding continues to suggest that the expansion of forensic analysis into property crime scenes provides a significant benefit to both the investigative and adjudication processes.
The decision to undertake this analysis as a focus of my dissertation, originated within my comparative background. In searching for dissertation topics specific to technology and comparative criminal justice systems, I became aware of a trend within several nations and their use of forensic evidence. As the use of these national DNA databases expanded, many nations had experimented with high volume DNA forensic processing (i.e. property crime scenes). If at a comparative level, it can be said that the collection and testing of DNA recovered from property crimes scenes is in fact highly beneficial to the agency, what is known within the factors associated with the decision to collect such evidence at the officer level? Regardless of the nation, Australia, New Zealand, United Kingdom, or the United States, each noted considerable benefits within clearance rates (or resolution rates), prosecution filing rates, and cold hit programs. In fact, in but a small pilot study within New Zealand, Walsh et al (2002) noted an increase in resolution rates for burglaries across the nation from 14.3% to 17.2% during the pilot program (p. 212). Considering the few agencies involved within the experiment, this was an impressive increase in resolution rates and equally impressive were the rates discovered within other nations. It is at this point that I wanted to understand the factors that influence an officer's decision to process property crime scene evidence. It is not feasible to process every property crime scene. However, understanding the factors that influence an officer's decision to process such evidence is vital to improve the investigative process specific to this crime type.

Currently, research has revealed a considerable backlog within crime scene evidence processing (see. Strom & Hickman, 2010; Pratt, Gaffney, Lovrich, & Johnson, 2006; Home Office, 2005; Lovrich, et al., 2004). However, most important are the results from the Home Office (2005) estimating that 11-percent of property crime cases yield DNA evidence suitable for processing. To put this into perspective, there were 2,199,125 burglaries as reported by the
UCR in 2009 (Federal Bureau of Investigation, 2009). This would indicate that there exists potentially, 241,904 property crime cases with forensic evidence suitable for collection and processing.

As noted above, research suggests that there is benefit to processing forensic evidence within these cases and empirically there exists considerable cases with suitable evidence. However, what is uncertain is under what circumstances an agency or individual officer decides to collect and process evidence within these cases. In addition, what is relatively unclear and anecdotal is the influence of additional stakeholders within the decision making process. The purpose of this dissertation is to understand how routine DNA forensic processing is within property crime scenes and to understand the factors that influence the decision to process such evidence, exceeding financial constraints.

My dissertation committee chair once offered that the question is always more important than the answer. The answer while illuminating depends on an intriguing and thoughtful question. The current answer to the question, as to what factors influence an officer’s decision to process forensic evidence within property crime scenes, has typically relied upon the financial constraints within the agency (see. Roman et al., 2008). However, as Ashikhmin et al. (n.d.) and Roman et al. (2008) suggest, the return on investment is considerable. In fact, in the Denver study, Ashikhmin et al. (n.d.) claimed a cost savings of more than $5 million in police costs and $36.8 million in property loss prevented by the expansion in processing of forensic evidence within property crime scenes. With that said, there is little denying that costs are one factor, but what additional factors influence the decision to process forensic evidence? To date federal funding has nearly exceeded $400,000,000 (Nelson, 2011) to address, in part, the national backlog and while this accounts for one factor, what additional factors prevent agencies from
expanding their forensic analysis or facilitate in such processing. Is it an issue within training, a lack of desire to expand the police role into evidence collection (a mechanism to limit costs), or is conflict or synergy between the agency and that of additional stakeholders regarding the expenditure of resources for low-level crimes (perceptions of worth) a factor? Current research provides but anecdotal evidence into potential factors that inhibit or facilitate in DNA analysis within property crime scenes. It is the intent of this dissertation to understand those factors by conducting a national survey of police agencies.

Few can deny the role of forensic evidence, such as DNA, as a powerful investigative tool within the criminal justice system. Consider the case of Joseph Cave, also known as the "flashlight rapist", convicted in 1991 for burglary, who went on to commit several additional crimes including five rapes. In part to the dedication of a detective, who submitted the DNA of Cave, resulted in a “hit” within CODIS, leading to his subsequent conviction on eight counts of burglary, five counts of rape, four counts of sodomy, three counts of sexual abuse, and one count of attempted rape (Lovrich, et al., 2004).

As incidents like this began to make state, regional and even national news, states around the nation have begun to modify and greatly expand their DNA collection and retention policies. However, as DNA collection and retention policy begins to expand, it seems the opportune moment to determine what factors influence decision-making within the processing of property crime forensic evidence.

There is no denying that DNA has proven reliable and vital to criminal investigations (Miller, 2003), and with such increasing utilization of DNA and the subsequent politicalization of such technology (Soulliere, 1999), it becomes important to determine those factors influencing

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1 Appendix A contains a chart that lists each of the statutory provisions associated with DNA retention policies across the nation.
the decision-making process of officers working these cases. Manning (1992) in one of the first
scholarships into the police organization and technology offered that there was a disconnect
between technology and the police organization and thus police practice. According to Manning
(1992), the relationship between technology and police practice developed to produce and
reproduce traditional police practice. Nearly two decades later, Manning (2008) would conclude
after six years of intensive research that this outcome was very much still valid and that police
practice comes to shape technology, technology rarely shapes police practice. However, as Kling
and Iacono (1989) noted, technology is slowly modifying the organization and it is this
"modification" that this dissertation seeks to explore to add to the state of knowledge within
forensic evidence analysis.

With such marked implementation of DNA forensic evidence into police practice,
scholars have argued that the ever-increasing utilization of DNA must be sought to pursue justice
for victims. While not a primary focus of this dissertation, it is important to acknowledge this
perspective. Concepts of justice and equality are debated, argued, often misunderstood and
misinterpreted but nevertheless these principles rest as foundational elements of a criminal
justice system, built upon a modernized criminal justice process. What exists against the
discussion of morality and justice is the counterpoint of immorality and injustice. In an era of
technology implementation marked by forensic practices and the ever-reliance upon such
evidence within the criminal justice process, there exists individuals whose victimizations are
acknowledged but whose forensic evidence potentially remains uncollected, untested, or shelved
to be forgotten. Likewise, there exist future victims whose experiences need not occur but who
will be victimized potentially by a system, which views processing of such evidence as
expensive, burdensome, and unworthy of focus.
To argue for expansion of forensic processing within property crime is problematic as typically, the arguments offered are primarily philosophical and it is for this reason that this dissertation seeks to rise above the philosophical by understanding the decision-making process within property crime scene evidence. However, to argue for what amounts to equal treatment of DNA evidence pertaining to property crime at a practical level, it is important to acknowledge the philosophical. Immanuel Kant once wrote that of many goals of a just system, the purpose of the state is to "Do no one injustice" (Weinrib, 1992). In writing on this responsibility, Kant would conclude that the state among many things is responsible for the mediation of conflict and the successful resolution to conflict. When the state fails to intervene, there is injustice (Weinrib, 1992). To ensure that justice occurs, the state must be held accountable (Garland, 1990).

Within the context of this dissertation and set against the philosophical backdrop offered by Kant, it seems appropriate to offer a revision to the interpretation of injustice that Kant offered within a modern forensic context. A more modern interpretation could offer that the state violates "Do no one injustice" when it fails to protect a citizen from victimization when they possess the necessary means to do so. It is in part for the victims that this dissertation is presented, to facilitate in improvements within the DNA forensic process to ensure that the state is maximizing its use of the CODIS system and that the expansion of such forensic collection into the investigative process can become integrated within standard operating procedures.

While seemingly easy to argue by policy makers, the expansion of forensic processing is rather nuanced. The challenges reflect at a cultural, legal, organizational, technical, and lastly a practical level. There are issues concerning the legislature and challenges presented to the police agency who is legislatively required to process samples but who lack the necessary training, technology, funding, and organizational culture to process forensic evidence in the most
effective and efficient manner possible. At a technical and legal level, questions remain as to the reliability of the technicians and even the techniques of collection, processing, and retention of forensic material. Lastly, there are cultural issues, reflecting in that of privacy, which as Nissenbaum (1997) offers, is quintessentially "American". In sum to the very infallible belief in forensic evidence, it is vital to understand the influences on officer decision making.

Research has demonstrated that expanding DNA analysis into property crime scenes is advantageous across numerous levels (see. Dunsmuir et al., 2008; Roman et al., 2008; Briody, 2005). Likewise, scholars have questioned the effectiveness of expanding DNA analysis into homicide crimes to improve case clearance rates (Schroede, 2007). However, to date, few research projects have sought to identify the status of forensic analysis within property crime scene processing and the associated factors that facilitate or impede collection and testing. This dissertation acknowledges that forensic analysis is a proven and reliable investigative tool but unless scholars and practitioners understand the factors associated with the utilization of such forensic evidence; evidence kits will remain shelved, not solely out of fiscal deficits, but also cultural and organizational constraints.

**Statement of the Problem**

At a fundamental level, forensic sciences is said to epitomize democratic policing (and by extension criminal justice systems) as it provides an accountable, verifiable, and reliable means of establishing innocence wherein abuse, misconduct, and corruption need not exist to see a successful resolution to a crime incident (Uildriks, 2009). From the inception of the modern criminal justice system, there has existed a need or more succinctly an organizational goal to investigate, arrest, and convict those guilty of crimes. While it can be said that justice is relative to each individual (Pepinsky, 1993), there is no denying that the criminal justice system and
those within it have consistently maintained a pursuit of justice that sees the successful resolution to crime incidents, while adapting to practical and organizational challenges (Littrell, 1979).

There is also no denying that in this pursuit of justice, those responsible for the application of justice have sometimes, unfortunately resorted to unmitigated fraud in lieu of alternatives to see a conviction (Davis, 2007; Grometstein, 2007; Sherman, 1978; Manning & Van Maanen, 1978). With the advent of forensic science, there came to be an alternative that delivered a scientific means to provide investigative leads to law enforcement detectives and offer a scientific basis to incriminate the guilty or clear suspects of crimes (Soulliere, 1999).

Within the police organization, it would also enable the development and eventual utilization of the analytical process of criminal investigative analysis and crime analysis to understand crime incidents across time and space at a macro and micro level (Paulsen & Robinson, 2004). In fact, the inclusion of forensic knowledge and thus practice into the police organization has had a phenomenal impact in improving clearance rates of cold cases and providing leads to investigators (Miller, 2003). Within the court system, it provided the prosecution with scientific evidence to link an individual to a scene or to provide exculpatory evidence to the defense (Nakashima, 1995).

The ability to link individuals to each other, objects, and scenes rests upon a single theoretical principle, the Locard Exchange Principle (White, 2007). Developed by Edmond Locard, the director of the first crime laboratory, in Lyon, France, the principle states that:

...whenever two objects come into contact, a mutual exchange of matter will take place between them. Linking suspects to victims is the most important and common type of linkage accomplished by physical evidence in criminal investigations. Linking victims and suspects to objects and scenes can also be accomplished by use of the physical evidence (Miller, 2003, p. 116).
This principle has guided the scientific community in the development of forensic sciences and as benefit to the police organization, has facilitated in the creation of three databases that retain forensic evidence samples for comparison. The initial implementation of forensic sciences into modern law enforcement started in the early 1900's with the collection, analysis, and retention of fingerprints and the eventual development of a database to retain and compare fingerprints at a national level, the technology and program would become known as the Automated Fingerprint Identification System (AFIS) (Soulliere, 1999). In addition, forensic sciences developed to track the weapons used in crime and therein was the creation of the National Integrated Ballistic Information Network (NIBN). However, arguably, no forensic science and therefore database of forensic evidence can be said to have more influence over the investigative process than that of Deoxyribonucleic acid (DNA) and the creation of the Combined DNA Index System (CODIS) to process DNA evidence (Leo, 2008; Pyrek, 2007, Lazer, 2004).

The utilization of DNA evidence and the subsequent collection, analysis, and retention of such evidence at a local, state, and national level has existed within the criminal justice system for over two decades. Fundamentally, the use of DNA at an investigative level is to establish if a given person is linked to a scene or to a person via the presence of their DNA, which is a universally accepted scientific means of identification (Derksen, 2010). With the realization of the importance of CODIS and its ever-increasing reliance as a tool within modern criminal justice agencies as both proof of modernity or more succinctly professionalism within a criminal justice system (Derksen, 2010), there has been a considerable increase in the collection and processing of DNA samples. As of March 2011, the National DNA Index (NDIS) contained over 9,535,059 offender profiles and 366,762 forensic profiles (Federal Bureau of Investigations,
Recognizing that there has been a significantly marked utilization of CODIS, the item of great importance is that of the backlog in processing of evidence kits. Recent research by Goulka, Matthies, Disley, and Steinberg (2010) suggest nearly 563,939 property crime scenes with untested DNA forensic evidence (p.9). This is relatively close to the estimate backlog for offender samples. As of 2007, the estimated backlog in offender samples waiting for analysis was according to the National Institute of Justice (NIJ) 708,706 or 599,622 according to the Office of Inspector General (Office of the Inspector General, 2009).

A critical read of this introduction is likely to leave a reader questioning whether there should be expanded forensic processing of property crime incidents, when violent crimes like sexual assault greatly overshadow property crimes like burglary, criminal trespassing, and larceny and those kits are rarely tested (Strom & Hickman, 2010). It is not the intention of this dissertation to argue that one is any more worthy of processing but rather, understanding the factors associated with the decision to collect and analyze property crime scene evidence is necessary to transition the police agency into a more forensically oriented organization, which has an impact on all-forensic evidence processing.

To offer a perspective, the treatment of forensic evidence can take two paths: 1) forensic evidence attempts to link individuals to scenes or 2) forensic evidence attempts to link scenes to individuals. The fundamental difference in the treatment of forensic evidence has a tremendous outcome difference on "hits" within the system (Goulka, Matthies, Disley, & Steinberg, 2010). The former is reactive and the later proactive. Consider the following, as of March, 2011 the National DNA Index (NDIS) contained over 9,535,059 offender profiles but only 366,762 forensic profiles (Federal Bureau of Investigations, 2011).
Historically, consider that in 2006 there were 3,977,433 offender profiles in the system but only 160,582 forensic profiles from crime scenes (Federal Bureau of Investigations, 2011). As federal and state programs continued to push for more processing, the overall focus became that of offenders. In 2008, the offender profile submission rate exceeded 6,500,000 and forensic profiles within the system increased to only 249,000 a paltry increase in comparison to the offender profile submission rate (Federal Bureau of Investigations, 2011). Equal treatment in the processing of forensic evidence ensures that even those crimes that some may offer are insignificant (i.e., property crime) are analyzed and processed to improve the likelihood that there is an arrest and that subsequent victimizations are prevented or unsolved cases see a successful resolution.

The importance of forensic evidence is apparent across its uses in the system. Within the police organization, DNA affords identification of suspects and in many instances results in the dropping of charges against an individual that prior to the use of this forensic evidence would likely have resulted in a wrongful conviction (see Garrett, 2008; Scheck, Neufeld, & Dwyer, 2000; Potter & Bost, 1997; Radelet, Bedau, & Putman, 1992; MacNamara, 1969). In addition, DNA evidence assists in identification of those missing or unidentifiable because of environmental damage or mutilation (Lorente, et al., 2002). The benefits that forensic evidence provides within the police organization are tremendous. However, with such a rapid development of this new technology, there exists an opportune moment to examine the state of property crime processing and the factors that have facilitated or impeded its analysis within law enforcement.

**Purpose of the Study**

This dissertation seeks to determine the status of DNA forensic evidence analysis within property crime scenes and the associated factors that have either facilitated or impeded collection
or analysis of such forensic evidence. By examining both the scholarship on forensic processing of property crime scene evidence at a domestic and comparative level and the criminal non-specialization literature, it is the intent of this dissertation to offer policy and program development to states and agencies that may overcome the barriers that have impeded such expansion to highlight best practices.

Over the last 20 years, the NDIS system has become myopic in its focus. The overreliance on DNA offender profiles focused primarily on sexual offenders and other violent offenders and under-processing of forensic scene evidence has created an imbalanced system (Goulka, Matthies, Disley, & Steinberg, 2010). Consider the statistics presented earlier, 9,535,059 offender profiles are currently held within NDIS with only 366,762 scene samples. However, it is important to recognize that while political pressure had fostered a myopic focus, it has delivered considerable funding and an increased utilization of the forensic science. Determining the cause of this imbalance is multifaceted and exceeds the scope of this dissertation. However, the contribution of this dissertation to the academic knowledge on this topic is to ascertain those factors that have facilitated or impeded an agencies or officers' decision to either collect or submit for analysis, property crime scene samples.

To create equality in forensic processing is to align the police organization to understand the clear benefits that a more forensically focused organization can achieve. The importance of forensic evidence within policing ought to reflect that which Locard proposed. Using science and institutional knowledge to identify suspects and see a successful resolution to a criminal incident by the linking of scenes, objects, and victims to individuals. Therefore, the purpose of this dissertation is to address the following:
• At a comparative level, analyze current literature pertaining to the expansion of forensic analysis into property crime scenes denoting key findings.

• Identify factors across a stakeholder continuum that has either facilitated or inhibited property crime scene processing within agencies.

• Based on the literature and leveraging the conducted survey research, offer practical improvements to overcome factors that have impeded the expansion of forensic analysis into property crime.

To meet this purpose, this dissertation relies upon two research questions:

• How routine is property crime scene forensic processing within the United States?

• What factors influence an officer's decision to process forensic evidence discovered at a property crime scene?
  
  o Accounting for financial factors, what additional factor(s) have an influence over an officer's decision to process property crime scene evidence?

Significance of the Study

In 1965, then President Johnson issued a special message to Congress. He appealed to the American people, criminal justice institutions, and Congress to identify ways to reduce what was a significant increase in crime. Within policing, he called upon agencies to become more efficient and effective across issues of training and investigations. Noting with great precision how the "average citizen" is concerned with "street crimes" the police would need to adapt to the changing environment. Two years later, in 1967, President Johnson would form the Commission on Law Enforcement, which criticized the police for not using technology to address the organizations primary problems. The report noted that science and the police organization had
been linked since the creation of the modern police force but the organization had become reluctant to embrace technology with the exception of specific crime problems, which were primarily violent crime related (Soulliere, 1999). The reality is that forensic science is vital to the success of the police organization, though its importance may not reflect the organizational perception.

David Bayley (1994), one of the most well-known and respected police scholars noted in his work "Police for the Future" that police organizations must adapt to the changing environment. Agencies can no longer continue on a predetermined path to accomplish goals. Agencies must seek new ways and adapt old practices to solve crime and create order. Bayley (1994) offered that the inclusion of DNA identification procedures was promising to assist agencies in meeting these demands. David Lazer (2004), in writing on DNA and the criminal justice system, believes that the benefits to the criminal justice system are phenomenal. However, police agencies lack both appropriate resource allocations and organizational changes for DNA databases to have a significant impact on addressing crime.

While resource allocations are often outside of the agency’s control, with the exception of grant programs, the issue of organizational change is of great importance. While some scholars have argued that it is imperative for police organizations to transform and embrace technology to prevent crime (Welsh, 2002), others, most notably Manning (1992), have argued that technology, while innovative to the police mission, is unlikely implemented as envisioned because it must address clear benefits across the police mission (which reflects the organizational culture). Therefore, to argue at any other level for the modification of police practice via technology inclusion is naïve without taking into account this organizational culture (Chan, 2001; Manning, 1992).
In a recent analysis into the state of unanalyzed forensic evidence, Strom and Hickman (2010) noted that while studies have sought to explore "the extent and nature of the use and processing of forensic evidence" (p.399), largely unexamined is a "holistic" view of evidence processing or an analysis that peers into the "black box" of police agency and crime laboratory evidence processing (i.e. decision-making). The significance of the present study is that it is designed to examine the decision making process at the officer and agency level, to move forward future survey-based studies by understanding the factors that either inhibit or facilitate in the decision to process forensic evidence recovered from property crime scenes.

Determining what factors influence officer decision making is vital to understanding how to expand forensic analysis into property crime scenes across the nation. While technology influences agencies and policy dictates practice, it is the street-level bureaucrat who implements policy (Lipsky, 1980); as such, the significance of this study is the ability to understand what factors influence these practitioners decision-making process concerning forensic analysis of property crime scenes. To understand the factors associated and the best practices within agencies that process property crime scene DNA is to transition the police force into one more forensically-oriented.

**Methods and Procedures**

The methods incorporated into this dissertation reflect what has been marked as the "gold standard" in research designs that of the mixed-method approach (Creswell, 2009). This method incorporates both qualitative and quantitative research to obtain a more comprehensive understanding of the issue and the challenges presented. With that said, it cannot be denied that this dissertation has notions of advocacy and as such, I am cognizant that my later discussion on victims, justice, and forensic evidence will involve a more personal narrative. Equal treatment
before the law has been a mantra of victim advocates for decades and in this new millennia and expansion of forensic science, it must not be forgotten that all victims should receive the same treatment, even concerning forensic evidence of property crime.

In selecting this dissertation topic, I wanted to highlight the uncomfortable reality of victim experiences when their cases go unsolved and subsequent victimizations occur. Likewise, I wanted to highlight the experiences of officers and the organizational challenges that will result as states expand their DNA collection statutes. As such, my decision to incorporate both qualitative and quantitative approaches affords me the opportunity to present both the academic and practitioners perspectives by incorporating interviews with criminal justice professionals including those representing positions such as police detectives, Chiefs of Police, and prosecutors encompassing small rural and large urban environments. In addition to interviews, I have included several preventable cases of victimization. At a quantitative level, a national survey of police officers was conducted to determine what factors influence the decision to process property crime scene forensic evidence and what currently impedes agencies from processing such crime scene evidence.

**Organization of the Study**

This dissertation is structured into six chapters. This chapter introduces the problem, states the significance of the problem, and provides the research questions and study design. The reader is also introduced to key studies that support the expansion of DNA forensic evidence collection and a brief history of technology within the police organization is provided to highlight historical challenges and current opportunities.

Chapter 2 presents a review of the current literature across two major topic areas: The history of DNA within the criminal justice system and the current literature supporting expanded
forensic analysis within property crime scenes. Within the topic of DNA, a comprehensive review of both the history of DNA in the criminal justice system and the creation of the Combined DNA Indexing System (CODIS) and its hierarchy are included. Additionally, the history of DNA statutes are examined including state and federal funding initiatives, subsequent creation of the DNA backlog, and lastly the legal and privacy concerns associated with DNA collection and retention.

Chapter 3 focuses specifically on the investigative process and the practical benefits and potential issues that await agencies who expand their forensic processing. The section includes a brief history of technology within the police organization, current crime trends and clearance rates, and lastly the current state of the literature involving expanded DNA analysis is included. In addition, several comparative studies including the National Institute of Justice DNA Field Experiment case studies are presented in summary form.

Chapter 4 explains the methods and procedures framing this mixed-method dissertation, including the design, primary research questions, methodology, and lastly the methods used to analyze both the qualitative data (interviews) and quantitative date (survey research). The chapter also includes the relevant limitations in the study design. Chapter 5 summarizes the research findings relating them to the primary research questions and Chapter 6 includes the policy recommendations, practical application, and future research projects resulting from this dissertation.

Conclusion

The study of forensic evidence processing is important because it has far-reaching impacts on society, culture, criminal justice institutions, and individuals. I have intentionally framed this dissertation from a practical perspective, to highlight the responsibility that the police
have in maximizing the use of forensic evidence to not only accomplish their primary goals but also create justice for victims of crime. Examining the current research within forensic evidence processing is vital to understand the benefits, particularly within the literature suggesting how processing property crime can increase identification of violent offenders and in many instances prevent subsequent victimizations. Likewise, it is an opportune moment, as policy continues to move towards expanding collection practices, to examine the factors associated with the decision to conduct forensic analysis within property crimes.

In order to improve the forensic evidence process and create equal treatment in forensic evidence analysis, the police organization must be examined, including identifying the perspectives of those involved within the institution and that of those who interact with the agency including victims. It is an unfortunate reality to read about preventable crimes but it is increasingly disheartening to hear the horrific experiences that victims have endured at the hands of offenders who had forensic evidence been processed, their victimization could have been prevented. It is these stories that I include to highlight how routine forensic evidence collection and analysis of property crime scenes and transitioning law enforcement to be more forensically oriented maximize justice for victims by improving clearance rates of unsolved cases.

To modify police practice to create equality in the treatment of forensic evidence requires that at a pragmatic level, I identify why this is important to the police agency and even that of the individual officer. Therefore, in concluding this introduction, I offer that routine collection and analysis of property crime scene forensic evidence is important for four key reasons: 1) public safety, 2) transitioning the police organization into a more technology proficient organization, 3) public confidence in the police, and 4) justice for victims.

Public Safety
From a public safety perspective, expansion of forensic processing within property crime scenes can assist in preventing additional victimizations and identify individuals responsible for crimes thus removing them from communities. For example, consider what is currently known about property crime clearance rates. It has had one of the lowest rates of any index crime consistently over the years. In 2009, the clearance rate for burglary was 12.5 percent (Federal Bureau of Investigation, 2009). While this is appallingly low, it is important to remember that this is partially a result of investigative treatment towards violent crime, which has more resource allocation. With such low clearance rates, these offenders often have longer criminal careers before incarceration and thus have higher recidivism rates and research has indicated that violence can escalate for many of these offenders (McCue, 2007; DeLisi, 2006).

To offer an empirical assessment into public safety, consider the systemic life course literature on career criminals, indicating that a small percentage of individuals commit more than half of all crimes (DeLisi, 2005; Peterson, Braiker, & Polich, 1980; Shannon, 1980, Collins, 1977). In addition, consider the self-report data of career burglars. A series of research projects conducted in the 1980s revealed astonishingly high rates of offending. Visher (1986) uncovered an average of 98.8 burglaries per year while researching arriving inmates to a penitentiary, Chaiken and Rolph (1985) discovered slightly elevated rates with an average of 114.6 burglaries, and Chaiken and Chaiken (1982) uncovered a range between 116 and 204 in their prison research. This research alone, coupled with such extremely low clearance rates for burglary, suggests how expanding forensic processing within property crime could certainly improve public safety by identifying burglars and linking them to prior incidents. It must be added that a critical argument leveraged is that it is often rare that suitable forensic samples would be recovered at a burglary scene (Simoncelli, 2006). However, a pilot study in Miami-Dade and
Palm Beach counties revealed a 47.9% success rate for the recovery of CODIS-acceptable profiles (Roman et al., 2009). The Home Office DNA Expansion Programme yielded an 11-percent success rate within the recovery of DNA profiles\(^2\) (Home Office, 2005).

Transitioning from the empirical, consider the case studies indicating preventable crime incidents reported by Lovrich et al. (2004). In one of the later sections in the detailed analysis into the DNA backlog, Lovrich et al. (2004) identified substantial incidents of preventable crime including an incident of thirteen rapes that likely could have been prevented had the initial incidents forensic evidence been processed. In addition to sexual assault cases, the importance of scene and offender sample processing are ever apparent in a felony robbery incident that had the sample been processed could have prevented an additional seven robberies and five rapes. At a property crime level, the researchers identified multiple cases where additional sexual assaults and property crimes need not have occurred had the property crime forensic evidence been processed. While the above is but a brief introduction into the public safety benefits, there is no denying that expanding forensic collection and analysis practices within agencies will improve public safety both in the short and long-term.

**Transitioning the Police Organization**

Transitioning the police organization into a more forensically centered role is burdensome for multiple reasons. However, none is more challenging then overcoming the organizational culture. As both Chan (2001) and Manning (1992) suggest, the police organizational culture is highly resistant to change and modification or alteration of traditional police practice is increasingly difficult. This is echoed by Crank (2004), who notes how modifications to organizational culture or by proxy police practice cannot be changed easily or

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\(^2\) For complete statistics, please refer to the case studies presented towards the end of the literature review.
frivolously. To reform police practice at an organizational level is to appeal to the organizational traditions. As earlier presented, technology is often perceived as a threat to traditional police practice (Chan, 2001; Manning, 1992). When organizations implement technology, they do so in a manner that both produces and reproduces traditional police practice (Manning, 1992). With the increasing inclusion and subsequent forensic evidence collection role and thus responsibility placed on the police agency, there is most certainly going to be resistance. However, the expansion of the police role in evidence collection simply reproduces traditional police practice and only further aligns to the organizational goal of being a "crime fighter" (Crank, 2004).

A hallmark of famous police detectives is that of the fictional Sherlock Holmes, who used science to solve the seemingly unsolvable. Utilizing science to solve crimes should not appear as a threat to the detective. It is the application of science, skill, and ambition that marks a detective and aligning the organization to be more forensically oriented only reinforces what it means to "fight crime". Transitioning the police organization into a forensic role does not undermine the police mission or organizational goals, it seeks to further modernize, professionalize, and improve the ability for the agency to investigate crime. Technology in this capacity is not about forcing the agency into accomplishing another added goal (crime prevention) but rather allows for the enhancement of existing operational goals (the investigative process).

Public Confidence in the Police

There are multiple ways that expanding DNA processing can improve public confidence in the police, with the primary mechanism that of improvement in clearance rates. As Warr (1980) discovered in surveying the public about crime, while the perception of crime was often
distorted, most often community member's outlook on crime reflected the actual conditions. The reality is that unsuccessful resolutions to crime incidents have a negative impact on the image of the police and as perceptions of the police are very often developed vicariously (Rosenbaum et al., 2005) each unsuccessful case can have an overall detriment on the public confidence in the police. Improving clearance rates is the most obvious benefit. However, it should be added that confidence in the police and thus the criminal justice process is also about accountability.

There has been a long history of distrust of the criminal justice system and that of the criminal justice process, rightfully so in many instances. In fact, in 1996, then Attorney General Janet Reno declared, “Our system of criminal justice is best described as a search for the truth” (Pyrek, 2007). However, the reality is that both individual officers and organizational culture have facilitated in the false arrest and conviction of thousands of individuals. At a policing level, both Sherman (1978) and Manning & Van Maanen, (1978) highlighted how police officers may result to unethical means to see a case closure. Forensic evidence affords an extra layer of accountability to ensure that the individual suspected of a crime is in fact the person responsible. Forensics has long existed as an accountability mechanism on the part of the police (Miller, 2003) and via expansion; it affords a scientific means of establishing a linking connection beyond that of the officer’s word, which is of vital importance within communities that lack confidence in the police. However, in the current state of forensic sciences within the system, there are continued criticisms levied against agencies for manufacturing evidence or not voicing concern when evidence is improperly handled. If agencies have expanded their collection of property crimes scene forensic evidence, and officers see themselves as more responsible within evidence collection, it is incredibly vital to improve trust and confidence within the police institution.
Lastly, expansion of forensic processing affords an opportunity to facilitate in reducing processing times, decreasing processing costs, facilitating in interagency collaborations, and improving the overall image of the police agency as a professional and modern police force. While clearance rates and accountability are vital to improving public confidence and are often transferred by the media to community members, the reality is that citizens are concerned about how tax monies are spent. During the National Institute of Justice Field Experiment into high volume processing of DNA for property crimes, the additional cost to solve a property crime using DNA was $1,400 to collect and process DNA evidence, $4,502 to identify a suspect and $14,169 to arrest a suspect (Roman, et al, 2008). It should be added that the latter two figures represent identification and arrest of a suspect who otherwise would not have been identified (Roman, et al, 2008). In addition, in the Denver study, Ashikhmin et al (n.d.) noted a cost saving of more than $5 million in police costs and $36.8 million in property loss prevented by the expansion in processing. It would seem that concerning police confidence within a financial context, the benefits greatly exceed the potential costs. In what is the most critical statement on processing of forensic evidence recovered from property scenes in a 'best' case situation, Roman et al (2009) states "it is probably fair to characterize spending $3,679 to arrest a burglary suspect who would otherwise never have been caught, and who averages three prior felony convictions, as a small cost (p.365).

Justice for Victims

At this last level of significance, it is important to recognize that police officers are concerned with victims. Studying police and victims over the last 12 years has afforded me the opportunity to listen to officers interact with victims and interview victims of crime about their
experiences. While police scholars have described often cold and callous interactions between the police and the community, the reality can be quite different (White, 2007; Crank, 2004; Manning & Van Maanen, 1978). Most often officers want to help but are unable to do so because they are constrained. Collection and analysis of forensic evidence within property crimes scenes has the capability of not only increasing the successful resolution to victimization but offers the possibility that future victimizations are less likely to occur as a result of police officers having the necessary resources needed to link crime scenes to offenders ensuring that victims receive proper closure from the police.

In fact, the Denver DNA Burglary Project determined that with the assistance of DNA evidence, in burglary cases, the average prison term increased to 14-year terms compared to an average of 1.4-year jail sentences because of the power of DNA evidence. In addition, DNA evidence coupled with the investigative process, helped increase the filing rates for prosecutors to approximately 42% in cases with DNA, which was more than eight times the rate of filings in cases without DNA evidence (Denver DNA Burglary Project, 2004). The presence of DNA evidence, in the criminal justice process, ensured that significantly more cases made it to trial and in many of those cases; the resulting sentence was significantly higher, maximizing justice for victims who otherwise would have seen their case dismissed or a reduced sentence applied.

In addition, increasing evidence processing, increases the likelihood of obtaining a "cold hit", which indicates a successful identification of an arrestee or offender to a "cold case", a case that has exhausted all possible investigative leads. Lastly, in concert with a benefit to public confidence, those wrongly convicted must be included as victims who will benefit from increased DNA processing. There has been an increasingly number of individuals exonerated from incarceration, including death row, on the part of DNA testing (Leo, 2008; Pyrek, 2007,
Lazer, 2004). Expanding collection has the capability of improving the likelihood that those wrongly incarcerated are exonerated.

Concluding Point

In sum, to argue for expansion within DNA forensic processing recovered from property crime scenes, there must be clear identification that at a practical level modifying and expanding the police role in forensics at this level is both beneficial and warranted. Current literature suggests that expanding such analysis is beneficial (Dunsmuir et al., 2008; Roman et al., 2008; Briody, 2005; Lovrich, et al., 2004; Walsh, 2002). However, today a considerable backlog has emerged concerning property crime scene evidence and what remains unclear are under what situations and what influences shape forensic analysis in such cases. This dissertation is written with the belief that a more forensically oriented police force is capable of not only being more effective and efficient but is accountable to the very communities that it serves.
CHAPTER TWO

FORENSICS SCIENCE AND THE CRIMINAL JUSTICE SYSTEM

REVIEW OF THE LITERATURE

The prior chapter introduced, albeit briefly, the relevant issues associated with forensic analysis within property crime cases. The statement of the problem and research questions demonstrate that while clear evidence suggests how beneficial expansion of DNA forensic practices can be within the police organization, agencies are still reluctant to expand their practices. While considerable research has attempted to answer many of the complicated issues pertaining to DNA forensics, most notably the backlog (see. Strom & Hickman, 2010; Durose, 2008; Lovrich, et al., 2004; Horvath, Meesig, & Lee, 2001) few projects have sought to understand the factors associated with scene processing at the individual officer level.

Traditionally, research has suggested that financial constraints have limited the expansion of forensic analysis. However, recent research has suggested that while financial constraints do pose a challenge, they are not the sole inhibitor and the costs-benefit analysis suggests considerable benefits to the agency by reducing overall expenditures in the investigative process (Roman et al, 2008; Ashikhmin, Berdine, Morrissey, & LaBerge, ND). If costs are not the sole contributor to a lack of implementation, what additional factors impede or facilitate in forensics analysis within property crime cases?

Typically, research has concerned itself with exploring unanalyzed evidence (backlogs) (see. Strom & Hickman, 2010; Roman, Reid, Reid, Chalfin, Adams, & Knight, 2008; Lovrich, et al., 2004). However, few research studies have sought to survey police officers and their decision-making process concerning forensic DNA processing specific to property crimes. With expanding collection statutes and reduced fiscal appropriations, it becomes additionally
important to research officers as one mechanism of reducing costs for expanded forensic analysis is to expand the role of collection to that of the officer (Roman J. K., Reid, Reid, Chalfin, Adams, & Knight, 2008). As this study is bi-dimensional, the literature review is sectioned into two primary areas to provide the reader with a comprehensive overview of the state of DNA Forensics within the criminal justice system and the academic literature that supports expanding DNA forensics into property crime via linking across the cost-benefits, case linking (crime-to crime) and improved clearance rate literature.

What follows is a detailed analysis into DNA forensics that will introduce the reader to the topic and denote the current state of forensic analysis within the criminal justice system and the relevant issues. Following this analysis, the literature review will acquaint the reader with a thorough analysis into the criminal non-specialization literature demonstrating the lengthy careers of criminals and their non-specific criminal offending histories and why increasing processing of property crime has the potential to intervene in their offending.

Earl History of Forensics within Law Enforcement

The application of genetic based forensics within the criminal justice system began more than a century ago, with the discovery of the human ABO blood type by Karl Landsteiner in 1900 (Rudin & Inman, 2002). This groundbreaking discovery created the opportunity for investigators to collect and compare scene samples and blood collected from suspects to assist in linking them to crime scenes or providing exculpatory evidence. In fact, it can be said that genetic based forensics entered into the investigative process at a mainstream level in a relatively short period of time, when Lattes developed a portable antibody test for blood groups around 1915 (Rudin & Inman, 2002). While these kits were seldom used within law enforcement, these developments are vital to understanding the history of forensics within law enforcement, which
would seek out new scientific technologies to solve crime. In fact, the linking of groundbreaking scientific discoveries and technologies originated within the creation of the first crime laboratories and subsequent development of the Locard Exchange Principle. In concert, this laboratory and principle would come to facilitate in the linking of forensics to aid the investigative process.

Examining these developments demonstrates that while the forensic science existed, there was no mechanism to organizational framework to include the science within law enforcement practice. In fact, while fingerprinting had been around for centuries, it would not enter into policing until the early 1900s (Rudin & Inman, 2002). The forensic science existed but there was no mechanic, no drive to incorporate the science into the investigative process (Evans, 2007; Lazer, 2004; Rudin & Inman, 2002; Soulliere, 1999). As Rudin and Inman (2002) note, the development of forensic science and inclusion of the profession within the police service was built upon a scientific mean to connect suspects to crime scenes but required a catalyst, which had to exceed simply solving crime.

In many regards, if it were not for Edmond Locard and August Vollmer, it may have taken decades for the application of forensic sciences to enter into policing (Rudin & Inman, 2002). This emphasis on utilizing forensic science marked an era similar to that of criminology that would look to science and its seemingly objective evidence as means of ascertaining guilt or innocence. It was an attempt to move beyond the subjective interpretations of crime scenes and suspect behavior. Edmond Locard, whose theoretical principle has guided the development of all forensic sciences, would introduce forensic science to the police service. The principle states that:

...whenever two objects come into contact, a mutual exchange of matter will take place between them. Linking suspects to victims is the most important and common type of
linkage accomplished by physical evidence in criminal investigations. Linking victims and suspects to objects and scenes can also be accomplished by use of the physical evidence (Miller, 2003, p. 116).

Upon this seemingly simple observation, Locard would come to influence the application of forensic science within police services around the globe. In addition, to this principle, Locard is responsible for creating the first crime laboratory, in Lyon, France that would bring forensic science and that of the scientific method to the investigation process. Locard, like Landsteiner, believed that forensics had the capability of not only aiding in identification of suspects, but also had the capability of exonerating individuals at a scientific level wherein reproducibility, objectivity, and validation would mark this investigation tool (Rudin & Inman, 2002; Soulliere, 1999).

The application of science to identify criminals is not a relatively new phenomenon. In the early 20th century, criminologists attempted to identify via "scientific methods" those predisposed towards criminal proclivities. While Lombroso and those of his ilk were later discredited, as scientific methods improved (Rafter, 1997), there is no discounting the role of science to identify criminals. It was the merging of the objective science with that of the subjective process of criminal investigations that caught the eye of August Vollmer. To Vollmer the application of forensic science and by extension technology was but one of the many changes that the police service needed to become more professional.

August Vollmer, held as the "Father of Modern Policing" and by extension the "Father of Technology Implementation within Policing" (Soulliere, 1999) was heavily influenced by the work of Lombroso and the accounts of science aiding in the apprehension of criminals reported by Locard. Vollmer was inspired by the early work of those criminology pioneers and with Sylvester and Wilson brought forth the modern professionalism movement within policing.
Vollmer was ambitious in his decisions to advantage science and technology within the police force. He recognized that education and professional training alone could not create the skilled professionals he envisioned; rather higher education coupled with the inclusion of "science" would create a modern police force ready to perform duties and accomplish tasks as skilled professionals (White, 2007; Soulliere, 1999). Note the following key points, within Vollmer's tenure as Chief of Police in Berkeley.

- **1909:** Vollmer named the chief of police in Berkeley, institutes a Bertillon expert and purchases fingerprinting equipment, and creates the first *modus operandi* file system.
- **1919:** Vollmer begins testing delinquents and using psychology to predict delinquent behavior; he implements a juvenile program to reduce delinquency.
- **1921:** Vollmer guides the development of the first “lie detector” and begins developing radio communications between patrol cards; he also initiates handwriting analysis.

(White, 2007)

During his tenure, Vollmer introduced fingerprinting, evidence collection, graphology, and rudimentary database design, within file system storage (hard files). He petitioned Congress to create a national fingerprinting bureau and implemented a crime laboratory similar to what Locard had designed (White, 2007). Today research has discredited graphology, and the state of lie detectors are severely questioned (Alder, 2007). However, there is no discounting the vision that Vollmer had to create a truly modern police force by leveraging technology across all levels of the police organization and that of its tasks.

Today, numerous police agencies around the world have come to collect and analyze forensic evidence across fingerprints, blood typing, ballistics, and DNA. The acquisition of the technical skills and required budget have come to mark agencies as being highly professionalized
and often highlighted as the "gold standard" in modern agency capabilities (Lazer, 2004; Soulliere, 1999). To be able to process forensic evidence, including the latest technology developments, is to exceed the standards and represent the "best" of what police agencies are capable (Lazer, 2004). To offer a comparative perspective, consider the work of Saxena (1997), who in describing the state of policing in India, noted how the inclusion of forensics marked an agency as truly "modern" and indicated a state of professional police service. While the "gold standard" in forensic evidence has transitioned over the years as new tools and techniques evolve, there is no discounting the importance of forensics to the investigative process and that of the agency.

*From ABO Typing to DNA*

For nearly a century, ABO blood typing had remained the primary genetic based forensic evidence, which had widespread use within the investigative process (Rudin & Inman, 2002). Serology, as it would become known, used the unique markers present within blood to identify the presence of antigen and antibody systems. These markers would represent the blood types *Type A, Type B, Type AB, Type O*, and in addition had the capacity to indicate the presence of RH factors (positive or negative). The identification of these markers had the potential to link individuals, but not unequivocally identify an individual. The first known criminal case using the ABO genetic marker system occurred in 1902, a relatively brief period following the discovery by Landsteiner in 1900 (Bell, 2008).

As a source of genetic forensic evidence, blood was relatively easy to identify and in many of the cases it was collected was often in ample supply (i.e., violent crimes). However, the tests of the time required fresh samples and considerable volume, which limited its utilization. Recognizing this limitation, Leone Lattes developed a procedure for ABO testing of bloodstains
on cloth using a saline solution, which was capable of restoring the dried blood (Bell, 2008). However, there were still issues within the procedure and it was not until the late 1920s, when Franz Joseph Holzer developed an improved typing system that was capable of yielding results within smaller, older, and dried samples (Bell, 2008).

As police specialization evolved and the investigative process and subsequent cases took on a more specific focus, investigators would encounter crime scenes that had been cleaned as to mask the presence of a crime. As such, forensic science would evolve its techniques and tools to deliver to investigators a means of identifying blood. In 1937, Walter Specht would suggest that agencies utilize luminol as a preliminary test to identify the presence of blood (Bell, 2008). Over the next several decades, the tools and techniques would expand to provide investigators with means of linking individuals to crimes, such as cases of sexual assault via the ability to conduct a serology assessment on semen stains and saliva. As challenges emerged within investigations, the scientific community would develop techniques and tools that would prove instrumental to clearing what were horrible cases and often in circumstances in which the forensic evidence provided key to the prosecution's case.

However, ABO typing was not without its faults. While seemingly highly beneficial to investigators of violent crime, it required additional resources, adaptations within the agencies standard operating procedures (SOPs), and in some regards many officers found its inclusion to provide no additional benefit to the investigative process for the vast majority of crimes the agency was involved (Stevens, 2011). It should be added that one particular point of reluctance in its application was its conclusive power. As Garrett (2011) notes in discussing the case of Gary Dotson, while it was true that only 11% of the Caucasian population shared the Type B blood type and that Dotson in fact possessed this blood type, it in no way should have provided
evidence of his guilt (p. 87). Nevertheless, the evidence was used to convict Dotson in 1979. It was not until DNA analysis was conducted that Dotson was exonerated and released in 1989 (Garrett, 2008).

Scholars have argued that it was the expansion in the investigative utilization and the subsequent inclusion by prosecutors of ABO typing that would bring about its demise as a forensic tool (Stevens, 2011; Garrett, 2011). During the peak of its use throughout the 1970s and 1980s, primarily within cases of sexual assault, issues within evidence collection, improper testing protocol, and expert testimony that was misguided and in some instances false, undermined the forensic evidence as a tool (Garrett, 2011; Lazer, 2004; Radelet, Bedau, & Putman, 1992). As more incidents of misconduct and falsehoods became associated with the forensic practice, prosecutors and agencies became much less inclined to incorporate ABO blood typing into their standard operating procedures (Garrett, 2011; Lazer, 2004). In fact, the misuse of the forensic science is well documented (see. Garrett, 2011; Baumgartner, De Boef, & Boydstun, 2008; Gould, 2007; Lee & Tirnady, 2003) and few offer such an in-depth work as was done by Garrett (2011). In fact, Garrett (2011) uncovered numerous examples of individuals falsely incarcerated because of ABO typing and with police policy in the 1980s often not retaining evidence after a conviction, an untold number of individuals remained incarcerated with no mechanism to overturn their conviction. Police practice coupled with incidents of prosecutorial misuse facilitated in a negative perception to blood typing as a means of identification.

Criminal cases require a high standard of proof and while blood typing provided a means of linking individuals to incidents, there needed to be a more powerful method. As such, there would come to exist a forensic gap within investigations wherein forensic science would again
evolve to offer to the investigative practice a more reliable tool, Deoxyribonucleic Acid or, as it is more commonly known, DNA.

*The Science of DNA*

As Derksen (2010) states, DNA is a universally accepted scientific means of identification. Its universal acceptance is because DNA is contained in nearly every human cell and unique markers present within the genetic code allow identification to occur. From an investigative perspective, DNA is contained most readably within samples recovered from scenes. It can be found within blood, bone, mucus, tissue, skin cells, teeth, saliva, semen, sweat, and human excrement: feces and urine (Lazer, 2004). Most people possess within each cell 23 pairs of chromosomes (46 in total), half from the paternal source and half from the maternal, which when examined at a genetic level reveal a sequence of nucleotides that represent DNA. The DNA structure is aligned in a double-helix configuration, which contains four base types (Adenine, Thymine, Cytocine, Guanine), which in concert make up the DNA molecule. As the pairing of the bases are specific, Adenine (A) may only bond with Thymine (T) and Cytocine (C) may only bond to Guanine (G), by understanding the base pairings and the sequences within segments of the DNA molecule allows for means of distinguishing one individual from another (Calladine, 2004; Lazer, 2004).

While the above description of DNA is rather simplistic, it is important to stress that the human genome contains billions of base pairs, which are nearly identical (Calladine, 2004). The ability for DNA to uniquely identify a person relies upon key differences as contained within a segment of DNA known as "junk" DNA (Calladine, 2004). "Junk" DNA contains short tandem repeats (STRs), which are short repeating segments of DNA that differ between people (Calladine, 2004). Analyzing these segments across the chromosomal regions (loci) allows a
sequence to be completed to determine the alleles present in the sample. These short sequences vary in length but because they repeat in tandem at different intervals from person to person, it is possible to identify a particular person based on this unique pattern with extreme precision. For example, when matching across 5 or 6 loci, the probability of a random person's profiling matching a suspect is said to be 1 in 100 billion (U.S. Department of Justice, 2000).

Most beneficial within the STRs is that the short sequence can be replicated, meaning that a smaller sample can be amplified to produce a desired amount for comparison purposes (U.S. Department of Justice, 2000). As DNA degrades at a significantly slower rate and is constantly discarded as a natural process (i.e., skin shedding) it provides a scientific means to link an individual to a scene by the presence of DNA. However, it must be noted that DNA does not provide a timeframe, nor does it explain how DNA arrived at the scene. As the body easily discards DNA, it is quite possible to leave DNA at a scene and not to have committed the crime.

While the Locard Exchange Principle is vital to the investigative process, this fundamental principle also works against investigators as DNA can be discarded even via fingerprints. Subsequently, it should be noted that also of importance is the issue of sample contamination. The greatest weakness of this investigative tool is that of its sensitivity (Calladine, 2004). Improper handling of a sample could potentially transfer DNA between samples, effectively matching the scene sample to the scene sample and not the offender's sample. While processes have been developed to limit this potential error (discussed later in the literature review), nevertheless there are opportunities for contamination and deception via DNA to occur.

Equally beneficial, but controversial, is the ability for DNA profiles using the STR sequencing to identify siblings or close-relatives. The process, termed familial DNA typing,
affords law enforcement the ability to compile searches that are close, but not identical to the DNA evidence to identify potential suspects. At present, familial DNA is capable of revealing parents, children, and full siblings of the person matched within the system. In fact, the use of this technique made national news when the serial killer known as the "Grim Sleeper" was discovered via the technique (Rubin, 2010).

The "Grim Sleeper" was responsible for the deaths of at least 10 women in Los Angeles since 1985 (Rubin, 2010). The LAPD working with the Department of Justice had been conducting ongoing analysis on the samples hoping to find a match within CODIS, but throughout the years, there had been no such luck. It was not until the Department of Justice undertook a familial DNA search that there came a break in the case. The police had arrested a young man who matched the samples recovered from the crime scenes but who was also too young to be the killer. Further testing revealed that the partial DNA match reflected a parental relationship and the allele match was that of a paternal source (Rubin, 2010). While legal and privacy issues were being addressed investigators undertook surveillance and evidence collection from recovered pizza crust and on July 7, 2010, the LAPD arrested 57 year-old, Lonnie Franklin Jr. This marked one of its first uses within the United States, but is not the world’s first as the United Kingdom utilized the technique in 2004 to identify a killer (Bhattacharya, 2004). It should be added that the use of the technique is not limited to violent crime. Denver became the first state to utilize the technique for property crime, when detectives linked Luis Jaimes-Tinajero to two car thefts based on familial DNA (Griffin, 2009).

The discriminatory power of DNA to link individuals to crime scenes is clearly one of the most important forensic tools to investigators. There is no other forensic technique that has become universally accepted as a means of identification and its investigative benefits continue
to expand. Most recently even the most "unsolvable" case (that of identical twins) has now become solvable. Prior to the discovery that there are genetic variations within identical twins, a case involving such twins could not rely upon DNA evidence. Bruder et al (2008) discovered that there was in fact variation and as such, there now exists a technique to determine in such cases, which twin’s DNA matched the scene sample. While extremely rare of a case and often reserved to the fictional stories of crime television programming, there is no denying the science of DNA has demonstrated an asset to the criminal investigative process.

**History of DNA in Criminal Justice**

In many respects, the history of DNA in the investigation process has sought to aid in the identification of criminals for violent offenses. In fact, the very case that resulted in its widespread adoption was that of a rape and subsequent homicide of two young girls on November 21, 1983, and July 31, 1986 in Leicestershire, England. The case involved Colin Pitchfork, a husband, father of two, and local baker who subsequently raped and then killed via strangulation Lynda Mann and Dawn Ashworth both at the young age of 15. The first victim, Lynda Mann, was abducted while walking on a footpath and was raped and then strangled by Pitchfork. The investigation yielded valuable evidence via semen recovered from the victim. However, with no investigative leads the case stalled. It is important to note that during this period Pitchfork was arrested for indecent exposure and sentenced to probation.

Several years later, Pitchfork would assault, rape, and murder Dawn Ashworth. The investigation discovered that the cases had identical modus operandi and blood typing matched the semen recovered from the scenes, but blood typing alone could not provide any additional help to the investigation. The investigation uncovered a lead to a local man, Richard Buckland, who was subsequently arrested and confessed to the second murder. Seeking to link Buckland to
the first murder, the agency sought out the assistance of Alec Jeffreys, a Leicester University professor. Recently, Peter Gill, Alec Jeffreys, and Dave Werrett had developed a technique capable of extracting DNA from samples containing human cells, which could be analyzed to produce a profile capable of identifying individuals at a unique level (Gill, Jeffreys, & Werrett, 1985). Using this new technique, Jeffreys revealed that there was one person responsible for the rapes and murder of those young girls and that Buckland could not have been that person (leading to the first exoneration because of DNA profiling).

With this new forensic technique, the agency undertook a mass screening of all of the men in the area, some 5000, which yielded after six months of analysis, no profile matches. It was not until the agency received a report from a woman that overheard a man bragging about providing a DNA sample for a friend that the agency had their lead. Pitchfork was arrested, his DNA profile matched the semen samples recovered from the two rapes and murders and he was subsequently convicted on both charges.

The importance of the Pitchfork case within the history of DNA in Criminal Justice is how the inclusion of this new forensic technique resulted in several of the world’s firsts. This new forensic technique resulted in the exoneration of Buckland for a crime he did not commit, mass DNA screening, a preventable rape and homicide (DNA collection for low-level offenses) and the introduction of DNA profiling into the criminal justice system. The discovery by Jeffreys and his colleagues and its use by the police agency would come to mark a new era within the investigative process with a forensic tool that was capable of identifying individuals at a genetic (unique) level from material easily discarded as a natural human process (skin, saliva, blood, and semen). With this forensic investigative tool, skin underneath a victims nails, saliva on a cigarette found outside a home, saliva left on a soda can discarded within the house, the presence
of pubic hair when semen was no longer present, and countless other examples now yielded valuable forensic data that became capable of identifying and linking a person to the scene. However, there were no standards, no mechanism for collection, retention, or comparison. As such, within the United States, the Combined DNA Index System (CODIS) was created to allow for the comparison of DNA samples at the national, state, and local levels.

Creation of CODIS

The Combined DNA Index System (CODIS) is a hierarchical, combined system of three interlinking systems: the Local DNA Index System (LDIS), State DNA Index System (SDIS), and National DNA Index System (NDIS). It was authorized by the DNA Identification Act of 1994. In creating CODIS, the Federal Bureau of Investigation selected 13 STR loci as the forensic standard for comparison of samples. The decision to employ the 13 loci as the forensic standard relied upon the current forensic knowledge and capacity of laboratories to participate and cooperate based on current technical standards (U.S. Department of Justice, 2000). As noted prior, the discriminatory power of the 13 loci is extremely high. As DNA variations differ across racial background types, the probability of a match between two unrelated persons that are Caucasian American is 1 in 575 trillion (U.S. Department of Justice, 2000). To offer a more common scenario as to a match between two unrelated persons from a highly heterogeneous population, such as the United States, the probability match for the 13 core loci would be 1 in 10 billion (U.S. Department of Justice, 2000). Offered another way, DNA recovered at a crime scene and matched to an individual has a 1 in 10 billion chance of being that of another person.

Using 13 STR loci as the forensic standard, the Federal Bureau of Investigation created a computer software system capable of comparing DNA samples across the national, state, and local levels. To date the system has assisted in more than 137,000 investigations, producing over
142,700 "hits" (Federal Bureau of Investigation, 2011). As Table 1 displays, the CODIS system was designed to be hierarchical with three separate systems comprising the overall CODIS system. While the system is capable of comparing samples across all levels, the database reflects local (i.e. city or county) and state submission rules, which is to say there is great variation in what is submitted and available for comparison with the CODIS system based on eligible qualifying offenses. This was an intended characteristic designed to meet minimum legal thresholds, most specifically that of privacy concerns (Goulka, Matthies, Disley, & Steinberg, 2010). The system, housed at the FBI Laboratory, allows agencies across the nation to compare samples across four levels: Convicted Offender Profiles, Forensic Profiles, Arrestee Profiles, Suspect Profiles, Unidentified Human Remains, Missing Person, and Relative of Missing Person Profile.

**Convicted offender profiles** constitute the most common profile submitted to the system. As of April 2011, the National DNA Index (NDIS) contained over 9,635,757 offender profiles (Federal Bureau of Investigation, 2011). As of March 2011, when the Idaho legislature passed a bill to expand DNA analysis for "all convicted felons" (Associated Press, 2011), all states now include statutory provisions to allow for the collection and retention of DNA samples from convicted offenders. **Forensic profiles** (also known as scene samples) refer to collected DNA evidence obtained from unsolved cases. Evidence profiles are submitted to the system in hopes of obtaining a "hit" to match a known offender or to generate investigative leads, as of April 2011, the CODIS system contained 370,875 forensic profiles (Federal Bureau of Investigations, 2011). **Arrestee profiles** are the most recent addition to the NDIS system, as arrestee samples were ineligible for comparisons at the NDIS level until a revision to the Federal law in 2006.

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3 See Table 2 for an overview of the current statutory requirements for qualifying offenses.
These profiles reflect individuals arrested for offenses and differ greatly across state statutes.

Currently, 12 states allow for the collection and retention of DNA for all felony arrests. Suspect profiles, reflect DNA samples collected from suspects in criminals cases and the policy differs greatly from state to state. The current legal and privacy concerns have limited its inclusion into the NDIS system. The last profile within the system that agencies may compare against is that of Unidentified Human Remains, Missing Person, and Relatives of Missing Person Profiles.

Table 1: CODIS

<table>
<thead>
<tr>
<th>Local Laboratories (LDIS)</th>
<th>State Laboratories (SDIS)</th>
<th>National Laboratories (NDIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Local DNA Index System (LDIS) installed at crime laboratories is operated by police departments or sheriffs' offices. DNA profiles originated at the local level can be transmitted to the State and national levels.</td>
<td>Each State has a designated laboratory that operates the State DNA Index System (SDIS). SDIS allows local laboratories within that State to compare DNA profiles. SDIS also is the communication path between the local and national tiers. SDIS is typically operated by the agency responsible for implementing and monitoring compliance with the State's convicted offender statute.</td>
<td>The National DNA Index System (NDIS), the highest level of the CODIS hierarchy, enables qualified state laboratories that actively participate in CODIS to compare DNA profiles.</td>
</tr>
</tbody>
</table>


DNA Statutes

All federal and state laws permit DNA collection for individuals convicted of a felony. In addition, several states have expanded their collection to misdemeanor convictions and those arrested for certain criminal offenses, including all felony arrests (Gordon Thomas Honeywell Governmental Affairs, 2010). According to the latest collation of statutes provided by Gordon Thomas Honeywell Governmental Affairs (2010) and noted in Table 2, Alabama, Alaska, California, Colorado, Florida, Kansas, Louisiana, Ohio, South Carolina, and South Dakota have
the most inclusive laws in the country. These states permit DNA sampling for any individual who meets any of the below noted conditions.

1. Convicted of a felony
2. A juvenile adjudicated delinquent (including provisions for certain violent and non-violent crimes) or adjudicated not delinquent by reasons of insanity
3. A probationer or parolee
4. Convicted of a sex crime misdemeanors (i.e. indecent exposure or solicitation of a prostitute)
5. Persons arrested for any felony

(Gordon Thomas Honeywell Governmental Affairs, 2010)

Of importance to this discussion is that of arrestee samples, originating in the DNA Fingerprint Act of 2005, which authorized collection of DNA samples from persons arrested or detained under federal authority (Biancamano, 2009). With the passage of the act, many states passed similar legislation authorizing DNA collection within the arrestee designation (Biancamano, 2009). Currently, twelve states include conditions requiring samples be collected from a person arrested for any felony. Interestingly, while only twelve states have included the designation for "any felony" arrest, twenty-two states have expanded collection from individuals arrested for the crime of burglary. As Biancamano (2009) noted, there has been an increasing focus at the legislative level to expand DNA collection to the arrestee level for all felony offenses and some states have even went as far as to expand their collection to misdemeanor convictions, though not arrests (extending beyond misdemeanor sex crimes). As for 2010, New Jersey, New York, Ohio, Utah, and Washington include provisions for the collection of DNA samples from offenders placed on probation or parole. Variations as noted in survey research undertaken by the Interstate Commission for Adult Offender Supervision (2005) included Alabama that required DNA samples from all offenders placed on probation or parole; Missouri requires DNA samples from every probationer or parolee convicted of a felony and under supervision by the Board in Missouri; New Hampshire includes a retroactive provision of anyone incarcerated or under probation or parole for sexual assault; Nebraska requires any person convicted of a sex offense, included those adjudicated via probation to submit DNA samples; and New Mexico allows for DNA samples if stated in the conditions of probation (Interstate Commission for Adult Offender Supervision, 2005)
samples from individuals convicted of certain, but not all, misdemeanors (i.e. Gross Misdemeanors).

<table>
<thead>
<tr>
<th>State</th>
<th>Statutory Inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama, Alaska, California, Colorado, Florida, Kansas, Louisiana, Ohio, South Carolina, South Dakota (10)</td>
<td>All Felony Convictions, Juvenile Adjudications, Jail and Probation, Sex Crime Misdemeanors, All Felony Arrests (including Murder, Sex Crimes, and Burglary Arrests)</td>
</tr>
<tr>
<td>Alabama, Alaska, California, Colorado, Florida, Kansas, Louisiana, North Dakota, Ohio, South Carolina, South Dakota, Vermont (12)</td>
<td>All Felony Arrests (including Murder, Sex Crimes, and Burglary)</td>
</tr>
<tr>
<td>Alabama, Alaska, Arizona, California, Colorado, Florida, Kansas, Louisiana, Maryland, Minnesota, Missouri, New Mexico, North Carolina, North Dakota, Ohio, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia (22)</td>
<td>Burglary Arrests</td>
</tr>
<tr>
<td>New Jersey, New York, Oklahoma, Utah, Washington (4)</td>
<td>Misdemeanor Convictions (exceeding Sex Crime Misdemeanors)</td>
</tr>
</tbody>
</table>


As noted above, there has been a clear trend within states to expand their statutory requirements (Biancamano, 2009; Fender, 2007) and there is little reason to believe that states will slow down their expansion and refinement of existing laws (Biancamano, 2009). There is also clear evidence that DNA bills have continued to mark legislative sessions. In fact, in 2007, there were forty-two bills put forth in relation to DNA samples from arrestees and fifty-seven proposed in 2008 (Biancamano, 2009). As of March 2011, eighty-six bills have been put forth concerning DNA, often expanding DNA collection, refining costs, or clarifying processes for expungement (Gordon Thomas Honeywell Governmental Affairs, 2011). Despite many of the bills and amendments failing to pass committee or failing a vote, DNA testing bills continue to occupy a prominent place within law enforcement policy during legislative sessions. Consider
the 2011 legislative session in Georgia, which put forth the following proposed amendment to

*Code Section 17-6-1 of the Official Code of Georgia.* The amendment reads as follows:

"(k)(1) A person charged with any offense which is bailable only before a judge of a superior court as provided in subsection (a) of this Code section shall be required, as a condition of bond, to have an oral swab or a sample obtained from a noninvasive procedure taken for DNA (deoxyribonucleic acid) analysis to determine identification characteristics specific to the person. Prior to the person's release from custody on bond or recognizance, the law enforcement entity responsible for releasing such person on bond or recognizance shall be responsible for collecting a DNA sample in accordance with rules and regulations established by the Division of Forensic Sciences of the Georgia Bureau of Investigation and notifying the person of his or her right to petition to exclude his or her DNA from the data bank in accordance with paragraph (4) of this subsection.

Under this amendment, persons charged with any offense that is eligible for bail, would be required to submit to a DNA sample. Similar amendments have been proposed across the nation and while as of yet, no clear scholarship has revealed a considerable movement, anecdotal evidence suggests that the movement to expand collection into arrestee sampling is occurring. Most recently, New Mexico approved bill (A-2594) expanding DNA arrestee sampling within the state requiring DNA samples from anyone arrested on suspicion of a violent crime. The 2011-2012 legislative sessions in Washington State witnessed the introduction of the Katie Sepich Enhanced DNA Collection Act of 2011, which looks to expand DNA samples from arrestees. However, while there has been a movement to expand collection, there are examples of bills failing to pass committee or failing to pass either a senate or a house vote. Recently, a bill expanding DNA collection to arrest offenses failed to move out of committee in Nevada (Ryan, 2011).

While, no state has yet passed legislation to expand DNA collection and retention across all felony, misdemeanor, and arrest categories, it is important to recognize the financial burden
that states endure as they expand DNA collection statutes. As one clear factor associated with the decision to processing property crime scene evidence relates to the budget, it is vital to examine the current funding initiatives and associated costs of testing. It is the intent of the following section to highlight the initialization of CODIS, examine the current funding initiatives and the relevant backlog research to provide the reader with a more comprehensive background into those financial factors.

*Initialization of CODIS*

The initialization and subsequent utilization of CODIS, while authorized in the DNA Identification Act of 1994, would not see a significant increase in utilization until 2004. It was not until the passage of the Justice for All Act of 2004 that there existed a legislative goal and more specifically a substantive funding source to ensure efficient and effective processing of DNA evidence. Scholars and practitioners have long marked the passage of this act as a commendable and indispensable source of legislation. It was perhaps Rago (2005) who offered one of the most succinct statements on the act, "The Justice for All Act and its treatment of the information science of DNA represents the most significant piece of criminal justice reform legislation, perhaps in our lifetime (p. 47).

The act was designed across seven key points.

1. Eliminate the backlog of DNA samples collected from crime scenes and convicted offenders
2. Expand the Combine DNA Index System
3. Improve and expand the DNA testing capacity of federal, state, and local crime laboratories
4. Increase research and development of new DNA testing technologies
5. Develop new training programs for the collection and use of DNA evidence
6. Extend the statute of limitations for crimes where the suspect is linked to the crime through DNA evidence
7. Provide post-conviction DNA testing and the preservation of biological evidence (Rago, 2005)
While the application of DNA forensics into the criminal justice process originated within the case of Andrews v. State (1988), up until the passage of the act, there existed limited utilization of DNA forensics within law enforcement. Much of the limitations originated out of needs to refine and evaluate the scientific methods and procedures within forensic testing (Peterson & Leggett, 2007), inclusion of forensic protocol within the investigative standard operating procedures (Lovrich, et al., 2004), alignment of the laboratory and agency, and effective resource sharing to distribute the costs of processing, which arguably has still not occurred (Williams & Hammond, 2009).

By many accounts, the generous funding allocations that are available to states has facilitated greatly in the use of the CODIS system. As would be expected, providing a funding source facilitates greatly in technology adoption. Consider the example of the in-car camera and its significant inclusion into law enforcement. To address increasing complaints and allegations of racial profiling, the Department of Justice's Office of Community Oriented Policing Services (COPS) created the In-Car Camera Incentive Program (IACP, 2004). This program created funds for agencies to deploy the in-car camera within patrol vehicles. A 2000 National Institute of Justice report noted that prior to the COP funding initiative, 3,400 (11%) of state police and highway patrol vehicles were equipped with in-car cameras (IACP, 2004). The IACP (2004) found that in the three-year period following the funding, there was a considerable increase in implementation of the in-car camera. With over 21 million dollars in grants dispersed to agencies, the implementation as of 2004 was over 17,500, which represented nearly 72% of total state patrol vehicles (IACP, 2004). It is clear that agencies embraced the mobile video system, in part to the substantial financial resources attached to the technology and the benefits that the technology delivered to the agency (IACP, 2004).
While this is but one example, it provides a valid point that concerning technology inclusion, unless there exists a funding source and an organizational focus on its relevance, there exists considerable resistance to such inclusion. In the case of the in-car camera, there was an organizational push to counter allegations of racism during traffic stops and the considerable funding allocations supported its nearly complete integration into law enforcement agencies. From a DNA perspective, there was resistance to its inclusion but with a dedicated and substantial funding source, its implementation would succeed if only marked by a considerable backlog.

*Backlog Research*

Stated simply, a backlog occurs when there are more forensic samples collected then the laboratory can process. While no universal definition exists, the National Institute of Justice defines a backlog as a sample remaining untested after a period of 30 days once submitted to the laboratory (Nelson, 2011; Williams & Hammond, 2009). Of interest within this operationalization of the backlog is the criterion of "once submitted to the laboratory". It is possible for samples to be collected but not submitted to a laboratory, excluding them from being considered a backlog sample. To date, considerable research has attempted to explain the amount of criminal cases that contain unanalyzed forensic evidence or the total offender backlog (reflecting individuals convicted of a crime). While the intent of this dissertation is to examine the factors associated with DNA scene processing within property crimes, it is of importance to highlight the backlog for offender samples. It must be remembered that currently the philosophy within the treatment of forensic evidence has myopically focused upon offender samples (Goulka, Matthies, Disley, & Steinberg, 2010). As of 2007, the estimated backlog in offender

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5 Please see Goulka, Matthies, Disley, & Steinberg (2010) for an analysis into the research that has been completed.
samples waiting for analysis was according to the National Institute of Justice (NIJ) 708,706 or 599,622 according to the Office of Inspector General (Office of the Inspector General, 2009). As of April 2011, there were 9,635,757 offender profiles (Federal Bureau of Investigation, 2011). In comparison, the total forensic samples as of April 2011, included 370,875 forensic profiles (Federal Bureau of Investigations, 2011) and recent research by Goulka, Matthies, Disley, and Steinberg (2010) suggest nearly 563,939 property crime scenes with untested DNA forensic evidence (p.9).

To date, there have been eight research projects conducted to ascertain the crime scene evidence backlog (see. Goulka, Matthies, Disley, & Steinberg, 2010). Peterson and Hickman (2005) conducted the first crime-scene backlog research surveying forensic laboratories and discovered approximately 50,000 scene samples submitted to a lab facility but had remained unanalyzed. Lovrich et al. (2004), in a national survey of law enforcement agencies, discovered approximately 221,000 personal and 264,000 property crimes that contained forensic evidence but were not submitted to laboratories, and over 57,000 cases that had been requested but were not analyzed. Pratt et al. (2006) using the survey research conducted in Lovrich et al. (2004) further specified 48,324 homicides; 154,649 rapes; and 253,931 property crimes that contained forensic evidence but had not been submitted and 57,349 homicide and rape cases that had been submitted but were unanalyzed. Hurst and Lothridge (2010) in surveying DNA laboratories discovered 68,543 unanalyzed crime-scene samples that had been submitted to a laboratory, this is a significant increase of the prior research of Durose (2008), who noted 38,227 unanalyzed cases. However, most noteworthy is the official rate reported by Nelson (2010), indicating approximately 100,000 scene samples that remained unanalyzed within laboratories. Keteyian
(2009), in an investigative report for CBS News focused on sexual assault kits within 24 states and discovered approximately 15,500 untested kits.

Of importance in the prior research is the focus on DNA forensic evidence. In the research of Strom and Hickman (2010), the researchers undertook a national survey of law enforcement agencies with specific emphasis on untested forensic evidence (comprising all forensic types). The researchers noted between the years of 2003-2007, potentially, 5,126,719 unsolved property crime cases, 27,595 unsolved rape cases, and 3,975 homicides contained forensic evidence unrequested for forensic analysis (p. 391). Using the results from Strom and Hickman (2010), Goulka, Matthies, Disley, and Steinberg (2010) calculated approximately 563,939 property crime cases, using the 11-percent DNA recovery rate reported by the Home Office (2005). To put this into perspective, there were 2,199,125 burglaries as reported by the UCR in 2009 (Federal Bureau of Investigation, 2009). Using the conservative estimate of 11-percent of property crime cases yielding DNA evidence suitable for testing, would reveal potentially 241,904 cases that would contain DNA evidence.

Reducing the Backlog

Recognizing that there is a significant backlog and that states continue to expand their DNA testing conditions, there have been considerable attempts to reduce the backlog. The most prominent method has focused upon increasing the availability of funding to states to facilitate in improving process mechanics to streamline DNA testing. Under rare circumstances, some states, despite having expanded collection practices, have limited evidence collection within certain crimes to reduce the backlog. With the availability of federal funding and improvements within DNA technology, it is important to highlight the current funding programs and improvements that have occurred within forensic testing to decrease the backlog and streamline forensic testing.
The following section addresses the status of federal funding, which has greatly influenced both the expansion and utilization of forensic testing, and the recent technological advancements.

**DNA Backlog Reduction Program**

The DNA Backlog Reduction Program assists states and units of local government with reducing their existing forensic backlog, improving their forensic throughput and overall turnaround time within DNA laboratories, and analysis of forensic DNA samples. The Attorney General is responsible for preparing a report to Congress including the aggregate amount of Debbie Smith DNA Backlog Grant Program grants, which are contained in abstract form at the National Institute of Justice. As is typical within federal funding programs, states (or agencies) are required to submit funding proposals and while there is a predetermined funding allocation assigned to each state, the proposals have an influence on the appropriation to each agency.

Prior to 2011, there existed two separate funding sources, comprising the Forensic DNA Backlog Reduction Funding and Convicted Offender/Arrestee Grant Program Funding. In 2011, the programs combined into a single program requiring one solicitation by agencies. As noted prior, the NDIS system did not contain arrestee samples prior to 2005 and as such, the funding awards to states did not begin until 2005. However, between 2005-2010, states were also awarded over $35 million within the Convicted Offender/Arrestee Grant Program (DNA Initiative, 2010).

In 2004, the initial federal funding allotment to states exceeded $65 million and over the next seven years, would average $56 million in funding allotments. In total, the program has provided, as of 2010, nearly $400 million dollars in assistance to states to reduce backlogs and improve their efficiency within DNA forensic collection and analysis (Nelson, 2011). As Table 3 depicts, as of May 2011, there have been 8,263,688 offender profiles and 366,918 forensic...
samples approved and stored within the CODIS system, which has resulted in 136,567 investigations aided. As of 2011, there are now currently 194 laboratories capable of analyzing and submitting samples to the CODIS system. As expected, recipients of federal funding have predominately been those with significantly higher index crimes and as such, California ($51,589,194), Florida ($33,585,401), New York ($21,122,133), and Texas ($35,742,680) have received considerable allocations of federal funding.

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* Idaho received no funding between the years 2006-2009.

**DNA Backlog Reduction Program Abstracts**

Of importance in this list of federal funding is that funds are contingent upon a submitted abstract and meeting the required federal program guidelines. From a property crime perspective, the Fiscal Year 2009 and 2010 abstract submissions contained considerable references towards increasing property crime processing. In 2009, Kern County was awarded $245,810 to improve their DNA analysis capability and in part to increase their capacity to process property crime forensic evidence (U.S. Department of Justice, 2009). Miami-Dade received $1,084,501 to increase their in-house DNA analysis and to fund outsourcing of property crime and cold cases
to a commercial laboratory. Palm Beach County Sheriff’s Office specifically noted in their abstract to improve the collection of crime scene evidence within minor property crimes and received $427,775. The trend continued in the 2010 abstract submissions with the Los Angeles County Sheriff’s Department receiving $1,561,300 to address their sexual assault kit backlog and analyze approximately 462 property crime cases (U.S. Department of Justice, 2010). Colorado, one of the case studies in the high volume property crime experiment, received $580,593 to improve their workflow process and continue with their property crime scene evidence collection practices. One particular recipient stood out in the abstract submission report, Pinellas County, Florida, that was one of the few recipients that specifically noted an "increased focus on property crime" as a reason for the funding. Unlike other recipients who either noted an increase in property crime evidence as the source of their backlog or sought to outsource such evidence, Pinellas County, noted intent to become better at processing evidence recovered in these cases. While it was a brief abstract, the county received $333,220.

While a theme emerged within the abstracts concerning property crime scene evidence, several states have sought to focus specifically on addressing their backlog by reducing collection of DNA evidence within these cases by placing a limit on what cases would receive testing. North Carolina and its funding request from the Department of Crime Control And Public Safety specifically included this provision, which explicably limits processing for this evidence type (though exceptions exist). The decision was made to improve turnaround times by limiting the analysis of property crimes and other minor crimes (U.S. Department of Justice, 2010)

It is important to note that agencies must demonstrate improvements within their forensic process to continue to be eligible for funding. As noted in the Solicitation:
**FY 2010 Forensic DNA Backlog Reduction Program**, any laboratory that receives federal funding must demonstrate by the end of the project period, improvements within their forensic process.

Expected results include:

- A reduction in the average number of days between submission of DNA evidence samples to the applicant's forensic science laboratory (or laboratories) and delivery of DNA test results to the requesting office or agency.
- An increase in the number of forensic DNA samples processed per analyst per month.
- A reduction in the applicant's backlog of forensic DNA casework.

(U.S. Department of Justice, 2010)

When a facility is unable to demonstrate improvements, they must include the following in their final report: 1) Descriptions of any observed increases in evidence submissions; 2) Explanations of issues which have negatively impacted project goals; and 3) approximate quantities for the increase in the forensic DNA casework backlog that would have occurred had the activities funded under this program not been performed (U.S. Department of Justice, 2010).

In the case of North Carolina, in both 2009 and 2010 abstract submissions, they noted a considerable backlog and one mechanism of reducing the backlog was to improve efficiency and synergy between the laboratory and the agency and to reduce the eligible cases that could receive DNA testing. The importance of this subsection within funding mechanisms is that while substantial funding is made available to agencies, there is an accountability mechanism that places considerable external pressure on the organization to become efficient in their processing of forensic evidence. While many agencies have expressed intentions to improve process mechanics, a few states have yielded to both internal and external pressure resulting in a reduction in forensic processing. The end-result is an agency that seeks to modernize their testing...
procedure by ignoring an entire range of cases. However, several agencies expressed an interest
to progress their antiquated testing platforms by incorporating robotic testing equipment.

Forensic Technology: Generational Improvements

As with any scientific process, the more it is used, the more efficient and effective it
becomes. Originally, collecting fingerprints proved burdensome because of the additional steps
and recovering latent prints from a crime scene, a chore in patients. However, with training,
institutional knowledge transfer, and improved technology, collection practices became routine,
the costs reduced, and the turnaround time for processing reduced to minutes (Komarinski,
2005). Each technological generation brought with it improvements. What started with messy ink
and modified index cards, transitioned into messy ink cards and a digital scanner. As the
technology improved, index cards were replaced with desktop digital scanners. Over time, intake
processing became streamlined and the technology took on portability, allowing officers to
process prints in the field. (Komarinski, 2005). At a practical level, consider the Livescan rapid
identification project, conducted in Minnesota, in 2008. The nearly $10 million project brought
the technology to agencies across the state, which allowed for booking fingerprints to be
collected and analyzed within a few minutes, including notifying the agency if the prints were
not accepted (CriMNet Program Office, 2008). This project also delivered portable
fingerprinting devices to squad cars, for field processing. What prior could have taken hours was
reduced to mere minutes as the technology improved.

While this is but one example, it demonstrates how generational improvements within
forensic testing have brought efficiency and effectiveness. It was not long ago that agencies
brought up concern over expanding fingerprinting collection practices. However, with training
and most importantly financial assistance, the implementation of the AFIS system became systemic and an important source of forensic evidence within the investigative process.

Overtime, DNA technology has improved and with it the ability to process samples at a more efficient and effective rate. As with the AFIS system, it would see nearly identical generational improvements. With each technology generation, the systems improved their capacity, their accountability (reducing error), but the system could not account for such expansive and mandated collection practices resulting in overburdened laboratories plagued with incidents of testing protocol violations. While the latter is of importance (and discussed in detail towards the end of this chapter), the former has seen considerable improvements to reduce costs, improve accuracy (reducing error), and streamline processing.

Forensic Technology: The Costs of Processing

In 2000, the average DNA profile cost $100 (Watson, 2000). However, this does not take into account the criminal justice system costs in processing a sample, which include the necessary chemicals and reagents and salaries of forensic technicians. Today, based upon the laboratory used (private or public), costs vary but as technology improves, the costs have been reduced. The DNA field experiment yielded a weighted average cost of a CODIS entry at $74, preliminary testing at $374, and another $135 to generate a DNA profile (Roman et al., 2009, p. 361). Additionally, within the experiment, Los Angeles and Phoenix utilized private facilities, significantly increasing their cost expenditures. For example, the Los Angeles facility spent $980 for preliminary testing and $167 for CODIS entry (Roman et al., 2009, p. 361). Of importance to note within the use of private facilities is not only the increased cost, but also the surcharge that may be assessed by the facility. In the RAND report completed by Goulka, Matthies, Disley, and Steinberg (2010), the researchers noted that private DNA labs often placed a premium on
expediency, including a $600 surcharge for a 15-day turnaround, an $800 surcharge for a ten-day rush, and a $1,000 surcharge for a five-day rush (p. 8). These private vendors also had contractual agreements for costs, which often exceeded (two to four times as much) the in-house costs for a confirmation sample analysis (one of the last steps in the process). Los Angeles paid $400 per confirmation sample, significantly higher than the $108 in Topeka or $280 in Phoenix (Roman et al., 2009, p. 360).

Collating all of the costs, Roman et al. (2009) noted that the cost per suspect identified was approximately $4,500, with a range of $1,466 in Denver (the most efficient) to a high of $8,147 in Los Angeles (p. 360). It is of great importance to note that these rates relate to processing property crime and as agencies become better familiar with the DNA process, these costs will be reduced. In the Denver site, deemed the most efficient and effective in their processing, the costs were relatively close to the estimated costs of rape kits, which hospitals and agencies have great familiarity with recovering (criticisms notwithstanding). According to Lovrich et al (2004), the estimated cost of a rape kit is approximately, $1,100. Equally important within the costs perspective is the associated issue of suspect identification and arrest (detailed within the police subsection). Under what is the best cost-benefit scenario, from DNA collection, suspect identification, to successful conviction, Roman et al (2009) states "it is probably fair to characterize spending $3,679 to arrest a burglary suspect who would otherwise never have been caught, and who averages three prior felony convictions, as a small cost (p.365).

Forensic Technology: From Technician to Robot

As forensic testing expands, the commercial market has responded to improve forensic testing products. Most notably, has been the introduction of robotic testing platforms, which are fully automated and capable of processing considerable amounts of evidence. Murphy (2006)
offered in 2006 that it would be feasible with the improvements within forensic testing technology to see analysts able to process up to 800 samples in a day (p. 9). Discounting, the magnitude of what 800 forensic samples equates to at a financial level, the possibility of an agency having such forensic processing efficiency is staggering, but is not unattainable.

When the United Kingdom initialized the DNA expansion program in 2000, it witnessed an increase of nearly 300,000 new samples per year, including evidence recovered from crime scenes (Kemp & Pinchin, 2007). Of importance within the initialization of the program was the harsh criticism that the police faced, when it was reported that up to 10-percent of DNA matches were not pursued, and of those crimes most not pursued were within car theft and burglary cases (Smith Alling Lane, 2000). This external pressure coupled with the increasing internal focus to maximize the use of the NDAD system, would see a significant increase in evidence scene samples, which originally placed a considerable strain on the system (Goulka, Matthies, Disley, & Steinberg, 2010). However, through robotic automation, improved sample processing, and improved evidence collection training, the system is currently capable of processing in excess of 12,000 subject samples and 1000 scene-of-crime samples a week, all while maintaining the capability of processing evidence within 24-hours under exigent circumstances (Kemp & Pinchin, 2007). While this is impressive, it should be noted that processing labs within the United States are capable of a similar turnaround time under exigent circumstances. However, the distinguishing feature within the United Kingdom system is the average of 3.5 days to analyze a suspect sample and the two weeks sampling time for crime scenes all while maintaining no backlog (Goulka, Matthies, Disley, & Steinberg, 2010). Currently, within the United States, the average turnaround for a case could exceed 90 days with an average typical of 60 days (Goulka, Matthies, Disley, & Steinberg, 2010. According to Kemp and Pinchin (2007),
Forensic Science Service (FSS), one of the forensic DNA testing providers within the U.K., is currently capable of processing in excess of 1,000,000 forensic DNA samples per year, an astonishing feat.

**Forensic Technology: Issues of Accountability**

In addition to the reduced costs and increase in processing, the movement to robotic platforms affords an increase in accountability to reduce error. As Soulliere (1999) eloquently stated, law enforcement and technology have entered into an era marked by the politicalization of forensic technology. Forensic technology has come to mark the era with an increasing utilization and reluctance to question forensic findings. In likely what is the best account of the power given to forensics is this quote from defense attorney David Baugh "If you put God on the witness stand . . . and God’s testimony conflicted with the DNA evidence, everyone would automatically say, “Why is God lying like this?” (As cited by DiFonzo, 2005).

Hyperbole notwithstanding, the belief in forensic science, specific to DNA, is absolute to juries. In a Multivariate and path analysis into the CSI effect, Kim, Barak, and Sheltoon (2009) discovered that most important within the CSI effect is the acquisition of beliefs favorable towards forensic evidence, which is to say that those who were exposed to CSI programs containing scientific evidence had higher expectation that what the prosecutor presented was valid. Today, juries and the community view DNA forensics as absolute and while the exclusionary power is remarkable, there have been considerable errors within labs.

While no statistical assessment exists as to the total number of cases completed in error, strong anecdotal evidence certainly suggests that there is a problem and one that most certainly will grow as states and agencies expand their collection statutes. Starting in 2001, reports began to emerge citing more than 100 DNA tests at the FBI Laboratory in error when a lab technician
had not performed a "negative control" to isolate DNA profiles from crime scene samples (Willing, 2003). A series of failures discovered in Minneapolis, yielded a contamination rate of two percent or one out of every fifty cases (Chanen, 2005 as cited by DiFonzo, 2005). Of interest within the Minneapolis incident is that the samples were accidently mixed into other crime samples. Even my state of Washington was not immune to profound error. In a news report for Seattle Post-Intelligencer, Ruth Teichroeb (2004) highlighted 23 major crime cases over a three-year period conducted in error.

As DiFonzo (2005) collates within an essay on DNA forensic analysis, there have come to exist considerable errors denoting forensic analyses performed by "untrained, underpaid, and overworked forensic technicians" (p. 2). In addition, within many of these facilities technicians have come to reflect more police in "lab coats" then objective scientists seeking the truth. Uncomfortable is the reality that despite nearly a decade of news accounts highlighting considerable errors, which should have marred the forensics, its popularity and belief in its certainty, continues to grow.

Not forgotten in this discussion of forensic technology and accountability is the reality that false convictions exist and while DNA has resulted in numerous exonerations, it exists, as the last line of defense and the movement to robotic platforms is essential to reducing error. Uncomfortable as it has become, there exists considerable individuals "Convicted by DNA and exonerated by science". As the cases above denote, DNA has been used to convict many people to later be used to exonerate them because of technical error, improper testimony, or outright fraud. The movement to robotic platforms is necessary to reduce the potential of error and to provide safeguards to identify sampling error resulting from hands-on sample handling, which is

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6 In reference to the National Institute of Justice report, "Convicted by Juries, Exonerated by Science", detailing numerous cases of error.
one of the leading reasons for such errors. In addition, the redundancy and safeguards within the robotic platforms should afford additional protection that within the lab, opportunity for misconduct is decreased. Not forgotten is the highly conservative estimate by Huff and Killias (2008) stating an error rate of 1/2 to 1-percent within criminal convictions. It is vital that if agencies pursue enhanced processing of property crime scene evidence, there must be safeguards in place to ensure that error is reduced. Staley (2005) in collating research for GeneWatch UK, highlighted a UK National Criminal Intelligence DNA Database report stating that internal and external quality assurance assessments on the system require an error rate below 0.05%.

A recent evolution has taken place within robotic platforms in the creation of the HID EVOLution System. A recent test of the system detected that the rate of contamination within the system is 0.00, during automated liquid-handling operations. The system was designed with multiple sub-routines to safeguard evidence to run a fully automated analysis. As the researchers discovered, the system is capable of reducing errors within hands-on sample handling, minimizing pipetting errors, and improving both throughput and processing consistency (Fang, et al (2010).

Subsection Conclusion

The discourse within forensic evidence has occurred throughout the last century. The application of such scientific evidence has brought closure to victims and exonerations from those victimized by the criminal justice process. The investigative process has uniquely benefitted from such inclusions to see resolutions to some of the most prolific crimes. The Green River serial killer eluded capture for decades to only be later identified via DNA recovered from
one of his calling cards. While such crimes are few in numbers, their notoriety has facilitated in states increasingly passing legislation requiring forensic testing for an entire range of individuals (offender and arrestee). Such expansion has created a forensic backlog that continues to plague states and agencies around the nation. Adding to the burden is the complications within property crime scene evidence that often remains uncollected or collected and unanalyzed (Strom & Hickman, 2010).

This subsection was designed to introduce forensic testing within the investigative process, to ensure that the reader is acquainted with the history and contemporary issues involving DNA forensics. In addition, it was important to outline the funding mechanisms and statutes associated with DNA testing, including the current literature involving the backlog and technology improvements that have occurred. If forensic analysis has become intrinsically linked within the criminal justice process, it is of importance to understand how engrained it has become specific to the institution of focus within this dissertation, that of the police. As such, this last chapter subsection is dedicated to the literature denoting the benefits of DNA expansion within property crime scenes, including the criminal non-specialization literature to help craft a convincing argument that the expansion of forensic analysis within these scenes is beneficial and warranted.
CHAPTER THREE

THE POLICE ORGANIZATION, FORENSICS, AND THE INVESTIGATION PROCESS

Bayley and Nixon (2010) offer that of the many facets within the changing environment of policing, DNA forensics poses a considerable benefit and challenge within the organization. It is important to remember that over a decade prior Bayley (1994) would offer a similar finding. The reality is that the inclusion of DNA forensics or that of forensic evidence such as fingerprints has been met with resistance. While early research revealed that the investigative process did not enjoy considerable benefit via forensic evidence (Greenwood, Chaiken, Petersilia, & Prusoff, 1975), later research would come to highlight the benefits that "tangible evidence" could produce within the investigative process and that of the adjudication process (see. Briody, 2004; Peterson, Mihajlovic, & Gilliland, 1984; Forst, Lucianovic, & Cox, 1977). Among the benefits discovered were improved clearance rates, improved collection and analysis rates via application of institutional knowledge to forensic evidence detection (including training), improved prosecution filing rates, and increases within the length of incarceration (see. Roman, Reid, Chalfin, & Knight, 2009; Denver DNA Burglary Project, 2004; Briody, 2004; Walsh, Moss, Kliem, & Vintiner, 2002; Peterson, Mihajlovic, & Gilliland, 1984; Forst, Lucianovic, & Cox, 1977).

While the discovered benefits were considerable and well documented, agencies were still hesitant to incorporate forensic analysis into police practice. Research would later highlight that despite considerable expansion of forensic analysis within the criminal justice process, the utilization of such evidence within the investigative process was severely limited. In fact, Horvath and Meesig (1996) would offer that investigators viewed such evidence as complimentary to the interview process (a value add) to leverage during interrogations or, as
often was the case, the forensic analysis was conducted to support the prosecution. Stevens (2011) would later offer using survey research that currently many officers still view forensic evidence as disconnected from the investigative process.

At a comparative level, research within Australia, New Zealand, the United States, and the United Kingdom have demonstrated clear benefits that forensic evidence brings to the investigative process (see. Dunsmuir et al., 2008; Roman et al., 2008; Briody, 2005; Home Office, 2005; Lovrich, et al., 2004; Walsh, 2002). However, as Horvath et al. (2001) noted in their analysis within the history of the investigative process, few changes have occurred and most unfortunate is that forensic evidence has not become inexplicitly linked to the investigative process. As Roman et al. (2008) stress, while DNA evidence is a widely accepted investigative tool and has become routinely collected and analyzed in homicide cases (p. 12), its extension into property crime scenes has proven of interest but has not become widely utilized. Despite the availability of such evidence indicating, high recidivism rates for these offenders, abysmal clearance rates, and the high probability that many of these offenders will escalate overtime, the expansion of DNA forensics within property crimes has been hindered.

*The Investigative Process with DNA Evidence*

As detailed in Figure 1, the investigative process involving forensic evidence includes six primary steps from evidence collection to generation of a matching report (Goulka, Matthies, Disley, & Steinberg, 2010). Specific to the DNA process, Bond, Phil, and Hammond (2008) express that there are five primary stages reflecting, (1) Recover, (2), Profile, (3), Match, (4) Arrest, (5) Solve (p. 798). Of importance within this process is the involvement of additional stakeholders, which may slow down the investigative process. Unlike the involvement of latent fingerprints, which can be collected, analyzed, and matched often at the agency level
(Komarinski, 2005), DNA forensics often requires assistance of an outside agency or private facility and while some agencies are capable of in-house processing of evidence, most require external assistance.

Figure 1: Overview of the Investigative Process Involving Forensic Evidence
Adapted from Goulka, Matthies, Disley, and Steinberg, 2010

The Decision to Collect

Most important within the initialization of the investigative process is that of the decision to collect such evidence, closely followed by the detection and recovery of forensic evidence. Concerning, the decision to collect evidence, research conducted by Griswold and Murphy (2010) suggests that investigators discretion guides the determination to collect DNA for potential analysis. While the research specifically sampled PERF members, the research does support much of the prior research indicating that officer discretion plays a significant role in the utilization of forensics (Horvath & Meesig, 1996). The results of the PERF survey (n=216) noted 85-percent of agencies indicated that investigator discretion influenced the decision to collect DNA evidence. 44-percent of agencies specified that the determination to process forensic
evidence was at the request of the prosecutor, 32-percent of agencies having a formal written agency policy, 30-percent utilizing an informal policy, and 18-percent describing that there were other factors influencing the determination (Griswold & Murphy, 2010, p. 31). Of importance to note within the "other determination" category is the role of the victim in determining if DNA evidence is collected or analyzed. Within forensic cases such as rape, the victim has a considerable role in determining if evidence is collected from their person.

Despite having a limited sampling frame of PERF members, the research does support much of the prior research on factors that influence officer’s decision to collect forensic evidence and in speaking with Griswold (2011), the researchers discovered, in follow-ups with officers, the surprising influence that the prosecutor has within the decision to process DNA evidence. Despite being anecdotal, it does reflect in prior research noting, again, the involvement of the prosecutor within the decision-making process specific to the investigative process and forensic evidence (Horvath & Meesig, 1996).

Collection of Evidence

As with any process, the quality of the output is dependent on the quality of the input. As such, the ability for DNA evidence to generate a profile match with sufficient evidentiary weight is dependent on the quality of the sample. In conducting research on the value of DNA material recovered from property crime scenes, Bond, Phil, and Hammond (2008) noted that numerically the largest sources of DNA recovered from these crime scenes are saliva (33.3%), cigarette ends (30.0%), blood (17.4%), cellular (i.e., offender touching an item leaving a skin sample), and chewing gum (3.5%) (p. 798). This is similar to the research of Roman et al. (2008), indicating that blood and saliva samples are significantly more likely to yield usable profiles, so much in fact that biological evidence had a higher probability matching then fingerprints. In addition, the
research by Walsh et al (2002) within New Zealand yielded nearly identical ratings. This was an unexpected finding within the research and speaks volumes towards the effectiveness of biological evidence. Within the DNA Field Experiment, Roman et al. (2008) noted that 16% of the biological evidence recovered yielded identification of a suspect with 9% yielding an arrest (p. 359). Equally, important within the research, specific to the identification and collection of forensic evidence, is that the quality of the sample is nearly identical between forensic technicians and officers that have received training. In fact, within the DNA Field Experiment, Roman et al. (2008) noted that as the experiment continued, more officers began to collect evidence for analysis. Their resulting submissions were accepted at nearly the same rate. Equally, important is that the forensic evidence kits are capable of processing multiple scenes and are easily procured at a significant discount. The kit above was procured during my duration as a Chair within the School of Criminal Justice at a prior college. They were purchased for students within the program for utilization during criminal investigation and forensic courses and cost approximately $100.00.

**Figure 2: Personal Forensic Kit**

**Officer Training**
While the science of DNA analysis requires specific training to interpret, collection of such evidence can be easily taught. In fact, the federal government provides a free self-paced training course concerning collecting DNA evidence at property crime scenes. The training is available to anyone who registers at the website (http://www.dna.gov/training/property-crime/) and covers four modules:

1. Types of Evidence
2. Crime Scenes
3. Evidence Collection
4. Combined DNA Index System (CODIS)

Having registered and completed the training course, it contained a wealth of information addressing many of the fundamental collection practices and providing considerable assistance in what to look for as potential sources of DNA evidence at a property crime scene. The training was immensely helpful in developing the survey instrument and better understanding the investigative process. As detailed in the interview analysis within the findings section, several officers noted how helpful the training was to become better acquainted with identification of DNA evidence and more importantly how to preserve the evidence and maintain integrity. While simply the impression of this author, the training would certainly prove of benefit to a seasoned detective or that of a patrol officer looking to better detect and handle DNA evidence at property crime scenes.

While the investigative process is relatively a straightforward process because of the limiting structure of the CODIS architecture (LDIS, SDIS, NDIS) and the limitations placed upon private labs (unable to upload profiles to CODIS), the system experiences delays. In addition, inhibitors emerge within the decision to collect such evidence within how useful such evidence is to the
officer. The reality is that police officers exist in a reactive world. The inclusion of such technology is often seen as a burden, hassle, or a resource expenditure that could be better spent elsewhere. The challenge in moving forward is to balance the inclusion, to highlight what awaits agencies that expand into such collection practices. Technology does not need to reform an agency; it needs only assist the agency in progressing it to be a better agency in how it delivers its services. In speaking with officers and as detailed in the interview section of this dissertation, there exist agencies that have resorted to handling burglary calls over the phone.

To complement this section on the relationship between police practice and forensic science, it is important to provide a brief history of technology within the police organization, to highlight the four key eras that have come to encompass the implementation and development of technology within law enforcement. It is the intent of this subsection to provide the reader with a more thorough understanding as to how technology has come to influence the organization and the power of the police organization to resist technology inclusion by modifying the technology to fit the organizations goals.

Technology Development and Implementation within Law Enforcement

There are three schools of thought concerning the use of technology within an organization. 1) Technology is modifying police practice, 2) Technology is simply a ploy in power by administrators to demonstrate "professionalism" regardless of how the technology is actually used in the agency, and 3) Technology is simply used to replicate traditional police practice and has not brought about any substantive changes. Manning (2008) offered likely the best explanation for the interaction between police and technology, when he noted that is reproduces traditional police practice. Rarely does the organization implement technology in a manner that drastically changes the daily tasks of officers. If officers are likely to encounter
additional tasking, the implementation either will fail or be utilized in rare circumstances when it is advantageous to the organization/officer (Chan, 2001). The purpose of this section is to highlight the relationship between technology and that of the police to demonstrate how traditionally organizations have embraced technology and what factors have come to influence technology implementation and associated practices. The development of police technology can be said to exist across four stages, as developed by Soullere (1999).

**First Stage: 1881-1945**

The first stage began in the late 1800s and ended in 1945. This stage signified the implementation of the core organizational technology that would reflect the professionalization of policing. It should be noted that Vollmer (mentioned earlier in the review of the literature) is credited with the creation of or implementation of many of the organizational practices and technologies that would mark this stage, such as evidence collection, crime analysis, and development of a crime laboratory. In an era of policing marked with a lack of professionalism (training, education), Vollmer would progress the field by merging science with institutional practice and knowledge.

It began with the creation of the red light signal system in 1907 that allowed for agencies to contact officers on patrol. What is important to remember is that these systems were not used to convey incidents to officers (i.e. incident directing) but rather were used to increase accountability and oversight within the rank and file. In essence, this was the first technology to increase a supervisor’s span of control. Vollmer would later institute a records management system, which included the collection of offenders Modus Operandi (the groundwork for modern criminal investigative analysis). Vollmer would also initiate the entrance of policing into
forensics through fingerprinting. What is important at this level is that forensics epitomizes the focus on improving clearance rates.

A last item of importance was in 1917 when Vollmer transitioned the entire Berkley police agency into the first fully motorized police force in the country and would introduce radio communications into the patrol car to improve agency to officer communication, and officer-to-officer communication. This improved officer safety and allowed agencies to more efficiently and effectively respond to calls for service within the community. It should be noted that the automobile is often referred to within technology literature (see. Soulliere, 1999; White, 2005) as being the first and only transformative technology that had the capability of changing how police would deliver services (from quasi proactive to entirely reactive). However, one technology in over a hundred years does not provide enough evidence to suggest that technology shapes police culture.

The first stage witnessed the foundational technology that would enhance the delivery of police services and reinforce the professional image of the police force as crime fighters. By the end of the 1st stage in 1945, police agencies had a mobile police force that could respond to calls for service from the community, could be held accountable by supervisors who had the ability to contact officers and issue commands, and lastly facilitated in the development and utilization of the hierarchical organizational structure and specialized police units that we see today via the knowledge specialization and focus on forensics to solve specific crimes (Soulliere, 1999).

Second Stage: 1946-1959

The second stage of technology integration was signified by the bureaucratization of the police agency. While short-lived from a technology perspective, 1946-1959, the technology that was sought and embraced highlighted the challenges the organization faced. With prohibition
ending about a decade before and with the end of WWII, police agencies found themselves with an increase in motorists and more importantly a population that witnessed an increase in utilization of alcohol. What the police lacked was a scientific means of assessing speed and levels of intoxication. It was not until 1954 that Dr. Borkenstien, a police captain developed the first breathalyzer, so during this period and with a mandate to address these particular crimes (focus on alcohol intoxication), police agencies witnessed the development of techniques that could assess speed (shadowing) and assess levels of intoxication (field sobriety tests). The technology provided an efficient and effective means of addressing the majority of police encounters. The technology made the police more efficient (the value within a bureaucracy).

Third Stage: 1960-1979

The third stage (1960-1979) indicates a complete reluctance of police agencies to implement technology. The reluctance was noted in President Johnson’s Commission in 1967, which criticized the police for not using technology to address the organization’s primary problems. The report noted that science and the police organization had been linked since the creation of the modern police force but the organization had become reluctant to embrace technology with the exception of specific crime problems and those were primarily violent crime related. Also of importance is the historical context. During this time, the police were increasingly organizationally introverted in dealing with their internal conflict. The “Us vs. Them” mentality and subsequent police community cleavage was becoming increasingly noticeable, police organizations found themselves cited for civil rights violations, brutality, and racism. There was so much internal conflict that looking to embrace technology to accomplish their mandate was furthest from their sights.
Recognizing the criticisms, the police embraced technology at the end of this stage that addressed the criticisms that they faced (the police did not care about the communities problems). Most notable within this stage was the creation of the 911 system, computerized record management systems, and computer-aided dispatch. All of which, reinforce the ability to respond to calls for service (reactive policing) and keep a record of those calls as a means of meeting any external requests for information from watchdog groups or other law enforcement agencies (Chan, 2001).

From a police culture perspective, 911 likely had the most influence on reinforcing the working class-personality. A report arranged by the Seaskate Corporation for Congress, highlighted 911 as a key technology implementation that had great benefit to the organization and to communities. As portrayed to police officers, 911 would exist as a mechanism for community members to seek assistance to address emergencies; this would reinforce the image of police officers as crime fighters. However, the reality was quite different. What was to be used for emergency calls for service would predominately be used for non-emergency calls. What was a technology that would reproduce the image of a crime fighter, only exasperated the cleavage that was forming as officers responding to calls for service found themselves in non-emergency situations. In this way, 911 as a technology did not shape the police culture it only strengthened the police culture that saw the community to blame for their victimization.

Fourth Stage: 1980-

The fourth stage identified by Soulliere (1999) began in 1980. This stage is signified by the "politicalization of forensics" including the development, implementation, and increasing utilization of forensic databases. These databases included the Automated Fingerprint Identification System (AFIS), the Combined DNA Indexing System (CODIS), and the National
Integrated Ballistics Information Network (NIBIN). In addition to these networks, the fourth stage brought networked interfaces within the patrol car, via the mobile data terminal, that allowed for access to local, regional, and national databases such as NCIC and administrative access to larger databases such as the National Law Enforcement Information Exchange (NDEX) and the National Precursor Log Exchange (NPLEX).

Of importance within this discussion within the eras of technology implementation and policing is the importance of context. Each technology era responded to the current challenges within policing. Thus, police technology implementation reflects the unique context of the era. The fourth stage is signified by the "politicalization of forensics", which has come to rely upon forensics across all level of the criminal justice system. With expansive collection programs in place across the nation, it is clear that DNA forensics has become commonplace within the criminal justice system and databases and processes have evolved to store evidence for process. While the original assessment from Horvath et al. (2001) still holds true, in many regards there is clear indication that the investigative process has incorporated DNA forensic evidence into the investigative process. However, what remains unclear are the practical benefits that come from increasing property crime scene processing. Obvious is the improvements within clearance rates, but to what degree. In addition, it is of vital importance to discuss the role of forensics within the COMPSTAT and Community policing paradigms. How an agency responds to DNA forensics within its existing model, is as important as the use of DNA forensics.

If "intelligence-led" policing does come to influence police practice, by the inclusion and reliance upon information utilization and sharing, it does become of importance to understand what benefits potentially await agencies that expand their evidence collection practices into property crime scenes. The following section provides the academic literature concerning
criminal non-specialization and the associated comparative case studies that have indicated clear agency benefits.

*Criminal Non-Specialization and Sex Offenders*

Early use of forensic evidence was predominately used to solve violent crimes, often specific to sexual violence. Subsequently, the expansion of DNA statutes (i.e., offender and arrestee sampling) and treatment of forensic evidence recovered at crime scenes relied upon the belief that sex offenders had elevated rates of recidivism and specialized, which was perpetuated by the political and social climate concerning sex offenders (Harris, Smallbone, Dennison, & Knight, 2009; Harris & Hanson, 2004). While their crimes heinous and some offenders a threat to public safety, the evidence suggests that sex offenders are not more likely to recidivate than non-sexual offenders (Harris, Smallbone, Dennison, & Knight, 2009). Prior to this research, Sample and Bray (2006) noted that sex offenders, despite the assumptions, did not display homogeneity. Rather, sex offenders are a heterogeneous group with varying recidivism rates. Using this research as a foundational element, Harris et al. (2009), discovered that those most likely to commit a sexual offense would have prior criminal histories (often-reflecting property or violent crimes). Despite later research, several studies reported such connections resulting in fallacies concerning sexual offenders. Consider the following USA Today article as referenced by Smith Alling Lane (2000):

*Study: Many rapists were thieves first Results may lead to taking.*” USA Today, July 10, 2000. A recently released Virginia study concludes that 40 percent of men arrested for rape began their criminal careers in property crime, such as burglary and petty theft. The study is expected to prompt more calls for expansion of DNA databases. The Virginia study supports a study in Britain that found that three-quarters of all rapists started off as burglars, and an ongoing study in Florida is finding that half of their rapists were burglars first.

As Sample and Bray (2003) argue, it is of great importance to note that burglary is not a "gateway" offense to sexual offending. It has been common for policy to utilize this assumption,
which has resulted in the creation of sex offender registries and additional requirements (Harris, Smallbone, Dennison, & Knight, 2009; Sample & Bray, 2006; Harris & Hanson, 2004; Sample & Bray, 2003). However, current research suggests that many of those who commit such offenses vary in their criminal offending transitioning between property and personal, violent and non-violent crimes (Sample & Bray, 2003). This heterogeneity within offending creates the illusion that burglary is a gateway to sexual offending; rather burglary is just one of the many offenses that these individuals commit including rape. Most important is that early research noting those descriptive characteristics, but few researchers gave attention to the relationship (see. Pokuchek, Ward, & Hudson, 1997; Southey, Braybrook, & Spier, 1994; Grubin & Gunn, 1990; Scully, 1990). At a comparative level, writing on New Zealand, Walsh et al (2002) noted that 82% of violent offenders had prior convictions, with 56% of those having prior property crime offenses (p. 213). When Virginia implemented its point-of-arrest DNA collection program, it discovered that within the 1000 "hits" the system produced, 37-percent of the violent crime matches linked to offenders whose only previous convictions were property offenses (Murphy, 2006).

Currently, research suggests that new sex offenses are more likely to be committed by people with nonsexual offense histories or by people with no criminal history (Harris, Smallbone, Dennison, & Knight, 2009, p. 42). Likewise, in the sex offender recidivism research of Harris and Hanson (2004), the researchers state that “Most sexual offenders do not re-offend sexually over time …this finding is contrary to some strongly held beliefs. After 15 years, 76% of sexual offenders had not been charged with, or convicted of, another sexual offence. The sample was sufficiently large that very strong contradictory evidence is necessary to substantially change these recidivism estimates” (p. 17).
Important within this subsection is the recognition that sex offenders, specifically those who commit rape, often have prior nonsexual offense histories, including burglary. While research has revealed that burglary is not a gateway offense, research suggests that for many of these offenders they do possess heterogeneity within their offending histories. Factoring in the results of both Hanson and Bussiere (1998) and Smallbone and Wortley (2004), that" adult sexual offenders are twice as likely to be convicted for nonsexual offenses as they are for sexual offenses, both before and after being convicted of a sexual offense" (as cited in Harris et al, 2009, p.1), suggests that expanded processing within property crime scenes is advantageous towards early identification of sex offenders. The claim is predicated on the results of the Home Office (2005) report noting an 11% success rate in the recovery of evidence suitable for forensic processing within property crime scenes. Consider the following two cases as reported by Smith Alling Lane (2006):

“DNA match brings charges in 1994 St. Louis killing.” Associated Press, September 6, 2006. In Missouri, a man already serving time for a burglary was charged in the 1994 rape and killing of a woman thanks to a cold hit on the DNA database. The 68-year-old grandmother was found raped and strangled in her bedroom with a vacuum cleaner cord. The DNA match came from seminal fluids recovered from the victim’s body. The man’s prior record includes convictions in 1997 and 1998 for burglary, tampering, and stealing credit cards.

“Rape of Alameda woman.” Contra Costa Times, September 12, 2006. In California, a cold hit on the DNA database has resulted in a guilty verdict for a 1995 rape. The victim was raped in her home after the man broke in for a burglary and was surprised to find her there. The man admitted to the crime when police approached him in prison. He now faces a sentence of up to 25 years in prison. He was initially included on the database due to a burglary conviction.

Additionally, consider the recent case of the "Twilight Rapist", whose varied offending history underscores the brutality of his offenses. As reported by KWTX News 10 (2011), Billy Joe Harris, a Texas prison system employee, is alleged to be the rapist, linked to nearly twenty
cases of home invasion, burglary, and sexual assault. The case summary as collated by KWTX News 10 (2011) is denoted below.

**Case Chronology**

January 21, 2009: Home invasion, rape in Yoakum
February 27, 2009: Home invasion, rape in Yoakum *DNA
July 3, 2009: Home burglary in Marquez (evidence recovered)
July 20, 2009: Home invasion, rape Marquez *DNA
August 14, 2009: Home invasion, rape Zabcikville (evidence recovered)
August 2009: Home burglary in Falls County
September 5, 2009: Home invasion and assault Marquez
September 11, 2009: Home invasion, assault Bell County *DNA
October 10, 2009: Home invasion, rape Falls County *DNA
October 24, 2009: Home invasion, assault, Centerville
November 9, 2009: Home invasion, assault Yoakum *DNA
November 24, 2009: Attempted home burglary Yoakum
November 24, 2009: Home invasion, fondling, Luling
December 24, 2009: Home burglary in Moody (evidence recovered)
March 1, 2010: Home invasion, assault, Moody
December 4, 2010: Home burglary in Edna (evidence recovered)
January 8, 2011: Attempted burglary Yoakum

While these are but a few cases indicating the link between property crimes and sexual assaults and arguably anecdotal at best, they are used as context, to connect the academic literature suggesting heterogeneity or non-specialization within many sexual offenders to the reality of these victimizations. From a property-crime scene evidence perspective, consider the following case:

In Florida, a match through the DNA database led to an arrest in a 1992 kidnapping, rape, and armed sexual assault. The man had a criminal history for domestic battery and battery on an elderly person, and was in the convicted offender database from previous arrests. His DNA sample was matched with crime scene evidence (Smith Alling Lane, 2008).

It is obvious to note that increasing forensic processing within property crimes scenes is advantageous to improve clearance rates specific to property crimes. However, it should be
added that increasing such processing has proven a reliable method to increase detection of violent offenders (Roman et al., 2008). As noted prior, the movement to expand forensic processing within property crime scenes reflects the current trend within research noting that those most likely to commit sexual offenses are those with nonsexual offense histories or those with no criminal history (Harris, Smallbone, Dennison, & Knight, 2009; Smallbone & Wortley, 2004). While sex offenders may specialize (pedophiles and child pornographers), recent research has revealed that this class of offender is versatile in their criminal behavior (Harris, Smallbone, Dennison, & Knight, 2009). These offenders are referred to as non-specialized criminal offenders and their criminal histories vary across personal and property incidents. Understanding the current recidivism rates and offender patterns are an important element within expansion of genetic forensic treatment. Currently, the misconceptions surrounding recidivism and offending patterns has fostered an attitude within the community that is misplaced and dangerous.

Intervening in Offending

A second benefit to expanded forensic analysis within property crime scenes is that of offending intervention. Early onset offending has been an ongoing and critical research topic within criminology, in fact, it was Moffitt's (1993) theory that would distinguish between early and late onset offending, denoting how those most likely to continue in their offending would reflect those who started early in their criminal behaviors. In fact, in the pinnacle study by Krohn, Thronberry, Rivera, and Le Blanc (2001), reviewing nineteen criminal career studies conducted over the last half century, noted that early onset criminals committed between 40 to 700 percent more criminal acts than those who took up crime later in their life course (p. 92). In addition, these offenders were significantly more likely to develop into chronic criminals and display non-specialization. DeLisi (2006) discovered similar results, noting how early onset
offending (denoted by the age fourteen), was a significant predictor for chronicity, dangerousness, offending frequency, career span, and violence specialization (p. 24). While the research findings further validated the early onset offending and career criminality literature, what was of importance within this research is the considerable delay in arrest for those early onset offenders.

As DeLisi (2006), noted, 62-percent of the habitual offenders were not arrested until age eighteen and an additional 25-percent not until the age of twenty-one. While DeLisi (2006) comments on a potential methodological issue within these rates (sample frame), it is important to highlight that the career burglary research conducted in the early 1980s (still considered valid), has supported lengthy careers by these offenders, originating from early onset offending (DeLisi, 2005; Peterson, Braiker, & Polich, 1980; Shannon, 1980, Collins, 1977). In fact, on average the offending histories displayed ranges at the lowest 98.8 (Visher, 1986) to a high of 204 burglaries per year, per offender (Chaiken and Chaiken, 1982).

Early interventions are an important first step in deterring further criminality, and while there are arguably several points of discussion within the desistance and treatment literature on the current effectiveness of such interventions (see. Pycroft & Gough, 2010), it is accurate to state that early and effective criminal justice intervention can have an influence on an offender's desistance from criminality (Skinner, 2010). However, in many of the crimes that these offenders engage in, specific to burglary and additional property crimes, the likelihood of arrest is low and therefore there is less chance that this intervention can occur. Instead, many of these offenders continue to commit crimes, vary across crime types, and increase their criminal capital (DeLisi, 2005). Recognizing that most burglary offenders are juveniles and young male adults, intervention in their offending histories by early detection is of vital importance (Cromwell,
Olson, & Wester Avary, 1991). With the expansion of scene processing within property crime scenes, Webb et al. (2005) discovered a reduction in the average number of days, from 89 to 45, to move from an active case to a solved case.

The Name of the Game: Clearance Rates

Of interest within this literature on intervention and identification of violent offenders is the importance of law enforcement clearance rates and timeliness of such case resolutions. Clearance rates have remained a de facto unit of measurement within agencies, as it is the mechanism by which they judge themselves and are judged by the public. Predominately, clearance rates reflect at the violent crime level, and while there is no discounting the reality of how heinous these crimes truly are, it is of importance to highlight how beneficial expanding forensic processing within property crimes can truly be for an agency.

Historically, burglary offenses have maintained consistently low clearance rates, a factor of resource expenditures, low leads, and jaded investigators who see little benefit towards solving such cases. Therefore, at a pragmatic level, what awaits agencies that expand their forensic testing into property crime cases? The answer is improved clearance rates. Research within the United Kingdom reveled that within their DNA Expansion Program, when forensic evidence was recovered, a suspect was identified in 41% of cases (Asplen, 2004). Within New Zealand, Walsh et al. (2002) highlighted resolution rates for burglaries containing forensic evidence at 24.8%. Those agencies that invested heavily within DNA databanks also witnessed the highest crime-to-person matching, at 42% (p. 212). In fact, the overall resolution rates increased from 14.3% to 17.2% and demonstrating the importance of submission rates, if agencies were to increase burglary submissions by 10%, the national clearance rate would rise ~3% equating to 1,000 solved burglaries (p. 212). The results of the NIJ DNA experiment, as
conducted by Roman et al. (2008) yielded identification rates of 31%, arrest rates of 16%, and conviction rates at 19%. Most important within these rates is that identifications, arrests, and convictions all doubled at the testing sites. These mirror by many accounts results in the United Kingdom and New Zealand. Also of importance is the recognition that suspects identified through DNA forensics, had more felony convictions than those identified conventionally (three times as many). While agencies may seem reluctant because of the media portrayal of such "trivial" crimes, consider these two news stories.

13. “Fast-Track DNA Thwarts Crooks.” Birmingham Evening Mail, March 8, 2003. In an area of the UK, a new 'fast tracking' of DNA evidence from property crimes is slashing the time it takes for DNA analysis to just seven days. Operation Safer Homes is a forcewide initiative to tackle house burglary, and many burglars are winding up in jail only days after committing the crime. Year-to-date figures show that since April offenses have fallen by almost 15 per cent compared to the same period last year, from 29,098 to 24,796 break-ins, leading to 4,302 fewer victims. (Smith Alling Lane, 2003)

25. “Burglary DNA Project Update.” Denver District Attorney and Denver Police Department Joint News Release, June 10, 2007. Denver’s participation in a federal study regarding use of DNA in property crimes is showing significant dividends. The project has identified over 40 prolific burglars since the project started November 1, 2005. (A prolific burglar commits an average of 243 cases per year.) For burglary cases where DNA is recovered, the prosecution rate is 5 times higher than cases without DNA. The average sentence for burglars linked to DNA is over 12 years in prison (compared to 6 months without DNA evidence). In a recent case, after police arrested one man - who later admitted to over 1000 burglaries – the burglary rate the neighborhood dropped about 40%. (Smith Alling Lane, 2007)

Recognizing that there are clear benefits to expanding evidence collection within property crimes scenes, it is important to highlight how common evidence remains at crime scenes. While most research depicts the 11% recovery rate as noted by the Home Office (2005), it is important to recognize that in the DNA Field Experiment, offenders with prior felony arrests were significantly more likely to leave evidence behind at a scene. Factoring in that many of the offenders are young, non-specialized (therefore lacking knowledge of how to avoid detection), and are unfamiliar with DNA, it is quite common for DNA evidence to be left at a scene.
Therefore it is important to highlight a few cases demonstrated how common evidence is discovered in these incidents. Consider the following case as reported by Smith Alling Lane:

In Kansas City, Missouri, DNA evidence left on chicken bones at a burglary scene have now been matched with a man who was already serving time in a Kansas jail on an unrelated crime using the national DNA database. Investigators at the scene found chewed-up chicken scattered around the residence - leftovers authorities believe were stolen from a refrigerator at the earlier burglary. The suspect had stolen firearms from several different residences. He has 16 prior felony convictions for second-degree burglary, stealing, tampering, receiving stolen property, automobile theft and resisting arrest (Smith Alling Lane, 2008).

In Wisconsin, a man has been charged with a church burglary after a cold hit on the DNA database. Authorities say they matched his DNA with some recovered from a saliva-laced cigarette butt found at the scene. The church building is a smoke-free facility. Investigators say had no suspect in mind when the butt was sent to the crime lab last winter, and a suspect in the church break-in probably would not have been found without the DNA match (Smith Alling Lane, 2004).

In Oregon, police detectives arrested a sixth member of the so-called "Dirt Crew," a ragtag cast of men suspected of burglarizing some 120 East Portland homes during the summer. While burglarizing homes, the man helped himself to whatever was in the cupboards, leaving his DNA on unfinished food and soda cans. Bio-evidence from cigarette butts left at several houses tied the other five suspects to the burglaries, he says. In fact, it appears they were behind scores of other break-ins that had gone unsolved. The total number of burglaries is edging toward 150. Investigators also uncovered DNA samples that don't belong to the current gang of suspects. "There could be some more arrests coming” (Smith Alling Lane, 2004).

In England, a man who took a bite out of a pear during a burglary was caught after his DNA was found on the fruit. The man was given a 12 month suspended sentence after admitting burglary. DNA analysis of the remains proved the suspect had been in the house (Smith Alling Lane, 2005).

“Prolific Burglar Jailed For Four Years.” Express & Echo (Exeter), January 22, 2004.
In England, a prolific burglar who admitted raiding 17 homes in three counties and stealing
£20,000 of property has been jailed for four years. The court that the heard 18-year-old was caught after police found his DNA on a carton of apple juice at the scene of a burglary (Smith Alling Lane, 2004).


In Australia, a man, whose DNA was traced to the scene of seven burglaries nearly two years after they were committed, has appeared before the Supreme Court. The man has pleaded guilty to the burglary of seven commercial premises committed between March 2001 and July 2002 but he was not charged until this year. It was not until advances in DNA technology, coupled with the fact that DNA samples were taken from the man after his arrest in 2003, that police were able to link him to the earlier offences. On different occasions, blood stains, a cigarette butt, part of a latex glove, and a partial fingerprint were all left behind (Smith Alling Lane, 2004).

While but a series of news accounts, these cases again demonstrate how common DNA can be recovered at burglary crime scenes. Likewise, as DNA is recovered and processed, it becomes engrained as a standard operating procedure to be included when suitable evidence is detected. As the rates described within this subsection note, there are clear improvements within clearance rates, but that is not the only factor that influences decision-making. Arguably, the factor most commonly reported as limiting DNA forensic analysis is that of costs and while the costs of testing were discussed in-depth in the forensic section, it should again be noted that in comparison, the cost of crime significantly outweighs the financial burden placed upon the agency that processes forensic evidence within these crime scenes.

Clearance Rates and Costs: The Pursuit of the Bottom Line

As reported by Kleiman (2009), currently, the police are allocated 60% of the overall criminal justice budget, which was $200 billion (p. 27). The reality is that the police receive a considerable allocation but the bulk of the costs reflect in personnel costs and equipment upkeep. From a forensic perspective, only a few studies have attempted to estimate the cost of processing and until recently, few that provided updated estimates concerning the cost of crime. With the economic recession and law enforcement hiring reductions that have occurred, it is important to
highlight the costs of processing and the costs of crime to demonstrate how the pursuit of
evidence processing within property crime scenes clearly fits within the “bottom line” mentality.

As McCollister, French, and Fang (2010) and Kleiman (2009) denote, the cost of crime
exceeds into trillions of dollars. To demonstrate the “bottom line” to the police, it is important to
recognize the politicalization of technology inclusion within law enforcement. As Garland
(2001) and others have discussed, politics drives policy, and as denoted within this literature
review, there has been considerable resources allocated to DNA forensic testing and analysis.
To frame this for an agency, in what is the crudest but most effective visual way, consider that in
the most recent cost estimates for crime, McCollister, French, and Fang (2010), denote the
tangible and intangible 7 cost of burglary at $6,170 and $321 (p. 104). In 2009, there were
2,199,125 burglaries as reported by the UCR (Federal Bureau of Investigation, 2009) and using
the conservative estimate of 11-percent of property crime cases yielding DNA evidence suitable
for testing, there were potentially 241,904 burglary cases containing DNA evidence suitable for
collection. The total tangible and intangible costs of burglary exceeds $14,210,745,750
calculated by the total reported incidents of burglary and the reported cost estimates of
McCollister, French, and Fang (2010) of $6,462. To further breakdown those rates using the
McCollister, French, and Fang (2010) victim cost rates of $1,362, the total cost of burglary to
victims in 2009 was $2,995,208,250. Important is that this rate reflects tangible costs; the
intangible costs (risk of homicide costs) would add another $705,919,125. The calculated
criminal justice system costs include costs at the federal, state, and local levels reflecting police,
prosecution, legal and adjudication, and corrections costs. According to McCollister, French, and

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7 According to McCollister, French, and Fang (2010), Tangible costs include crime victim, criminal justice system,
and crime career costs. Intangible costs include pain-and suffering, and risk of homicide costs.
Fang (2010), these costs were $4,127, resulting in $9,075,788,875 in criminal justice system costs.

![Burglary Costs](image)

Figure 3: Burglary Costs

Factoring in the DNA costs at the most efficient level as reported by Roman et al. (2009) of $3,679 and the 11-percent forensic evidence recovery rate, reported by the Home Office (2005), would suggest that the total costs of processing DNA evidence within property crime scenes at $889,964,816. It is reasonable to conclude that what Roman et al. (2009) state in their analysis into property crime scene high volume processing is entirely accurate; "it is probably fair to characterize spending $3,679 to arrest a burglary suspect who would otherwise never have been caught, and who averages three prior felony convictions, as a small cost" (p.365).

As depicted in the chart, the costs of evidence processing is significantly lower than the costs that victims incur. The reality of the costs of crime are often lost to visual depictions, but consider the victim whose house is burglarized, who feels apprehensive in their home, which should confer comfort and security. The loss of a few thousand dollars pales in comparison to the
loss of security and the unfortunate reality that in what is ~88% of the cases there will not be a successful resolution to the case. The formatting of the chart was specifically selected to highlight the uncomfortable reality that the cost of processing forensic evidence within property crime scenes is arguably not that expensive. As Ashikhmin et al. (n.d.) noted in their report, the pilot program within property crime scene evidence uncovered a cost saving of more than $5 million in police costs and $36.8 million in property loss prevented by the expansion in processing of forensic evidence within property crime scenes. To further demonstrate a point, the costs incurred as result of an average burglar, with an offending history of ~100 incidents per year (Visher, 1986), would result in a financial impact of $638,445 for one offender. Considering that most juveniles can go undetected for several years before a criminal justice intervention, demonstrates the potential financial impact a single offender has on the system. In addition, as the prior section noted, many of these offenders do not specialize so their offending will transition from property and personal, violent and non-violent, which significantly increases their financial cost to the system.

Improving evidence processing within property crime scenes clearly improves clearance rates and is financially sustainable in that it has the potential to intervene early in offending and improve clearance rates within unsolved cases. As the cost of processing samples decreases, through the inclusion of robotic platforms and improved detection and information sharing, and assuming a similar processing cost of $1,000 as noted for sexual assault kits, the cost of evidence processing, maintaining the 11-percent rates would cost $241,904,000 per year. While this is a considerable amount of resource expenditures, it pales in comparison to the $14,210,745,750 that burglary costs to society.

*DNA Concerns and Legal Challenges*
Originally, there existed considerable challenges, but as noted prior in the discussion on federal acts and state statutes authorizing DNA expansion, the current legal climate supports the collection of DNA at property crime scenes. However, it should be carefully reminded that victim consent should be sought. From an offender’s perspective, there is no expectation of privacy concerning samples recovered from a crime scene. That is to say that if they drink from a glass at the home, flick a cigarette to the ground, or spit on the sidewalk they have provided that to the public and have no expectation of privacy. However, the expansion of forensic evidence processing and the associated challenges reflect at a legal, ethical, and practical level.

Statutes of Limitations and Property Crime

While the collection of such evidence and database expansions are federally authorized and state supported, statutes of limitations have not kept up with expanded forensic protocol (Lynch, Cole, McNally, & Jordan, 2008). Specific to property crime scene statutes of limitations, the statute may expire in five years or as Lynch et al. (2008) note, in some states the statue may extend until ten years if the offender(s) is unknown or be as little as three years. The reliance upon and use of property crime scene processing exists to improve clearance rates but also improve hits for prior unsolved or “cold cases”. As discussed prior, it is not uncommon for evidence without a suspect to sit for in excess of 180 days before it is processed. In addition, as later detailed within the IPA interview of the rural, Alabama agency, this was common practice for cases of this type.

To overcome such limitations, agencies and prosecutors have returned to a legal loophole known historically as a “John Doe” warrant or more commonly today as a CODIS warrant. While unconventional, the application of such a warrant freezes the case in time. In essence, the DNA of the individual is charged with perpetrating the crime and when a match occurs, the clock
begins. California became the first state in 2000 to employ the tactic within a sexual assault case (Lynch et al., (2008). While little research exists to analyze the utilization of such warrants, anecdotal information suggests that the practice has become commonplace when the state legislature has not modified statutes of limitations to account for DNA forensics.

*Daubert Standard*

Of importance within this standard is not the acceptance of DNA as admissible evidence. The court has upheld a unanimous viewpoint that DNA forensics is a valid and reliable scientific technique, which is supported by its conclusive strength and universal acceptance as a scientific principle. However, where the standard becomes a challenge is the expansion of the police role to collect such scientific evidence. While Roman et al. (2008) highlighted that officers were equally capable of collecting forensic evidence from crime scenes, what remains unclear is how the court or that of the jury will view the officer as a suitable “expert”.

The *Daubert* Standard reflects the evaluation of expert witness testimony. When evaluating testimony the court looks to two prongs of admissibility:

1. Relevancy prong: The expert’s evidence must fit the facts of the case.
2. Reliability prong: The expert must have derived her conclusions from the scientific method.

While officers have become quite proficient at collecting fingerprints, little research has been able to answer the viewpoint of the court or that of the jury when the forensic expert responsible for such precise evidence collection (when contamination is incredibly easy) or when an officer undertakes the in-house lab facility analysis will influence decisions. The relevancy prong is quite easily met, but the ability for an officer to meet the reliability prong concerning forensic evidence may pose a challenge.
The means to overtake this challenge have been ongoing but what remains unclear is how much of the knowledge and training has been disseminated to agencies and officers. As described earlier, there is a federal training curriculum on property crime scene evidence processing, which most certainly could be expanded and modified to meet basic forensic evidence collection certification criteria. However, as later detailed, the movement to collapse the responsibility of investigation and evidence collection to a single person may prove a complicated venture (discussed later as a future issue – Conclusion).

**Ethical Dilemmas**

While there are clear benefits to the agency, there are most certainly aspects within the expansion of DNA evidence that prove worrying at an ethical level. Arguably the most outspoken on the expansion of DNA evidence is that of the ACLU (2009) issuing multiple statements concerning the expansion, retention, and potential issues involved with forensic evidence. The ACLU argues that continued expansion is just one-step closer to a national DNA database of all citizens. The organization has been very outspoken in ensuring that DNA evidence in rapes are processed efficiently, but are highly critical of expansions within the arrestee levels. Certainly, it could be argued that the expansion to the arrestee level is cause for alarm. As Ford (2009) reports in an examination into police practice, there has come to exist a practice within the U.K. to arrest and release individuals with the sole intention of collecting their DNA. While no research has examined such a practice within the United States, a similar practice could certainly be occurring.

To connect this to crime scene processing, the success of scene processing is dependent on the amount and type of individuals within the system. While match rates will decrease as the system further builds the offender pool, the focus on arrestee leveling processing will aid in
improving scene match rates (Goulka, Matthies, Disley, & Steinberg, 2010). Agencies that are efficient within offender and arrestee level processing and those more forensically active (submitting more scene profiles) will see a larger return on their investment (Walsh, Moss, Kliem, & Vintiner, 2002).

Joining the ACLU (2009) perspective, Simoncelli (2006) offers that the expenditure of DNA databases (and by proxy evidence collection practices) is a reckless venture and one that ought to be resisted on matters of principle, legality, and practicality (p. 390). While writing from the perspective on DNA sampling from all persons (National DNA Registry), Simoncelli (2006), notes a diminishing return for law enforcement. She focuses on two primary points, that of social and financial costs. From a practical perspective, Simoncelli (2006) notes that the current DNA database process has disproportionately highlighted increasing the number of persons in the database, which arguably has created an imbalanced database. To increase the amount of "hits" within the system, it is important to increase the inclusion of scene samples (Goulka, Matthies, Disley, & Steinberg, 2010). A second point offered by Simoncelli (2005) is that the recovery of property crime scene DNA is an exhausting and painstaking process. Noting statements from the Chief of Investigation of the Denver Police Department, the author claims that only 8-percent of burglaries can be investigated using DNA gathered from the crime scene (p. 392). However, as earlier discussed in this dissertation, this claim would prove false based on the results of the DNA Field Experiment. In fact, one outcome measurement of the research was that when properly trained, the quality of the collected scene sample were nearly identical. This was also noted by Bond, Phil, and Hammon (2008) within their analysis into the value of DNA material recovered from crime scenes. When properly trained, the collection of evidence is neither exhausting nor a painstaking process.
Despite research later refuting many of the points of critique offered by Simmoncelli (2006), within her analysis specific to law enforcement, the author does offer one specific point that lends itself well to this research. Currently, the collection practices have come to highlight offender and arrestee DNA sampling, which has overburdened crime laboratories. It is this point that must be echoed that while it is vital to match offenders to current samples; it is of equal importance to ensure that scene samples are processed to link offenders to their prior crimes (Goulka, Matthies, Disley, & Steinberg, 2010).

In times of financial constraints and with an ever-present focus on the status of the backlog, some states have made what could be considered dramatic changes in their policies to streamline costs. Arguably, a controversial adaptation to reduce overall costs is the decision to transition the financial burden of processing from the state to that of the offender or potentially even the victim.

**Shifting the Burden**

Survey research conducted by the Interstate Commission for Adult Offender Supervision (2005) noted several state requirements that placed the financial burden on those convicted of crime. Included examples note, the obligation within Arkansas, Pennsylvania, and South Carolina that requires offenders pay a $250 DNA sample fee (Interstate Commission for Adult Offender Supervision, 2005). The highest fee imposed on an offender was Hawaii at $500 (Interstate Commission for Adult Offender Supervision, 2005). Additional research undertaken by the North Carolina Office of State Budget and Management (2006) discovered that several states utilize fees and surcharges to offset the costs for DNA processing. As noted in the ICAOS (2005) research, the most common fee assessed for convicted offenders was $250. However, Kansas, Idaho, and Hawaii all included fees $400 or above and Arizona, Florida, and North
Dakota assessed fees for the actual cost of the forensic testing (Office of State Budget and Management, 2006). As states face financial burdens and continued pressure to expand processing across the arrestee and crime scene levels, it is important to take note that in many of these instances, those most likely to be arrested are also those most likely to be unable to pay and as such, the financial burden is returned to the state. In the pursuit of expanded forensic practice, it would seem logical to transfer the burden to those convicted of crimes. However, it seems illogical to extend such burden on those who are arrested for an offense.

At a practical level there is a real cost associated with the expansion of such forensic processing and while there has existed a movement to transition the burden to offenders and arrestees, it should be noted that it is likely feasible to assume that victims may share in the burden. It was not long ago that stories emerged of rape victims being billed to cover the costs, or partial costs, of their rape kits. If property crime scene processing becomes routine and the success rates increased, it is feasible to see the cost of testing transferred in whole or part to victims or slightly more damaging that of a new insurance industry, dedicated to such testing, which is an entirely different argument and an equally important cause for concern.

Conclusion
By combining literatures within forensic science and that of the criminal justice system to that of the relationship between technology, policing, and the investigative process, this dissertation provides a framework through which to examine how the expansion of forensic evidence processing within property crime scenes is both beneficial and warranted, while also understanding the potential for misuse. Horvath et al. 1996) offered that, “the police criminal investigation process has remained relatively unaffected by the significant changes that have occurred in policing, the crime problem and technology in the past thirty years" (p. 108).

However, in examining the most recent literature, including a comparative analysis of such
research has suggested that there has been a significant change to the investigative process. Agencies continue to look for ways to modernize their agency. While such modernization may only exist as symbolic capital (Manning, 1992), there exists a clear movement to incorporate forensic practice into the investigative process at a standard operating procedure level.

In addition, while the movement to expand such processing may only reflect the politicalization of the technology, its politicalization may in fact ensure its success. The benefits to an organization (and that of a politician in support of such expansion) are clear. An agency can expect to see better clearance rates, improvements within their “cold hit” programs, and there is a very minor deterrence application (<~1-2 percent). In addition, the increasing signification of DNA being used to identify the most heinous criminals from seemingly unaccustomed sources (property crime scenes) is just now starting to be highlighted in the media (see. Smith Alling Lane collation of news stories for examples).

Furthermore, there exists a clear practical benefit, which is supported by the underlying forensic science literature. To expand into property crime scenes is to improve policing. As such, there exists a considerable scene processing backlog and cases of evidence remaining uncollected and analyzed. While this literature review has provided the source of such backlogs and the evolution within technology to overcome such issues, there still exists an “unknown” within the literature. Research has demonstrated the cost benefits, agency benefits, and political benefits (and dangers). However, to date, no scholar has examined the current state of property crime scene processing and the factors associated within the decision to collect and process such evidence.

In the chapter that follows, I will explain the methodology utilized to answer these two specific questions to better understand the state of forensic crime scene processing and the
decision making process. It is the intent of the survey method used to highlight the experiences of officers. As Lipsky (1980) states, officers are your policy implementers. It seems appropriate to speak with officers, survey officers, and involve officers within the discussion that is property crime scene processing and the factors that influence their decision to collect and process evidence. If only at a practical level, this dissertation will be able to highlight if there has been a dissemination of knowledge concerning the benefits of DNA forensic evidence to the officers in the streets. In what has been millions of dollars spent to study the practice, it would prove advantageous to understand if any diffusion has occurred. Likewise, it would be valuable to understand the influence of additional external stakeholders within the investigative process. The following chapter highlights the methodology undertook to provide a "holistic" view of evidence processing within property crime scenes to complete an analysis that peers into the "black box" of police agency and crime laboratory evidence processing (i.e. decision-making).
CHAPTER FOUR
RESEARCH METHODOLOGY

INTRODUCTION

As Strom and Hickman (2010) discovered in their research, largely unexamined are the inner-workings within the forensic investigative process. The design of the survey and interviews conducted were designed to examine the decision making process at the officer level, and to move forward future survey-based studies by understanding the factors that influence the decision to process forensic evidence recovered from property crime scenes.

In order to reveal the status of forensic crime scene processing, specific to property crime scene evidence, and the factors that influence an officer’s decision to collect and process evidence, the research incorporates three sources of data to inform the study. The methods incorporated, include a quantitative component including a national survey of law enforcement officers and a qualitative component including personal interviews with police officers and external stakeholders within the investigative process. These data sources were designed to answer two primary questions: (1) How routine is property crime scene forensic processing within the United States and (2) What external, organization, and internal factors influence an officer's decision to process forensic evidence discovered at a property crime scene?

Developing a suitable sampling frame using officers proved rather challenging considering the reduction in financial assistance provided to researchers. However, with the generous assistance of the Southern Police Institute and Alabama Association of Chiefs of Police (AACOP), a suitable frame was identified and with a reduced sample size, it became increasingly important to include additional research methodologies. To answer the two primary research questions, triangulation was incorporated via survey research, open-ended questions,
and interviews. This mixed methodology approach relies upon both quantitative and qualitative data sources to explore the status of property crime scene evidence processing and the associated decision-making factors. While the quantitative component would provide the “hard data” concerning the rates of property crime scene processing, it was not suitable alone to peer into the “black box” that is officer decision-making (Strom & Hickman, 2010). For this reason, interviews proved invaluable sources to understand these multifaceted influences.

Prior to the research being undertaken, an expedited approval was sought from the Washington State University Institutional Review Board. A formal consent was obtained from each participant within the study across the survey research and personal interviews. While consent was obtained, it is important to highlight that no personal or agency specific identifiers were included within the survey to ensure confidentiality and anonymity. When names are used, they have been altered, as forensic evidence collection has become a considerable topic of interest within the media and to understand the state of forensic processing and more importantly the decision-making process, it was important to provide for anonymity within the research project.

*Design Overview*

Traditionally, research within the investigative processes specific to forensic evidence has come to rely upon describing the state of processing, the creation of backlogs, the forensic laboratories, or undertaking an analysis into to high-level crime incidents (i.e., sexual assault and homicide). However, even within the current research, few studies seek to involve officers and their experience and perceptions to highlight factors that influence their decision to process forensic evidence. In reviewing the literature, it became apparent that there exists a wealth of information to inform the inclusion of forensic science within the investigative process.
However, specific to property crime incidents, there were few studies that sought to involve officers as their primary sample to elicit their perspective on forensic processing within property crime scenes.

**The Theory behind a Mixed Methods Design**

As defined by Creswell (2009), “Mixed methods research is a research design (or methodology) in which the researcher collects, analyzes, and mixes (integrates or connects) both quantitative and qualitative data in a single study or a multiphase program of inquiry”. As a methodology, mixed method designs are not a new paradigm. Discussions on the approach can be noted as far back as the late 1950s, when Campbell and Fiske (1959) demonstrated the use of multiple research methods to validate findings. Later coined *triangulation* (Webb et al., 1966), the method is designed to minimize error to strengthen the confidence of the findings. Through incorporation of multiple research methods to study a single problem, a mixed method design produces complementary strengths with non-overlapping weaknesses (Johnson, Onwuegbuzi, & Turner, 2007), which enables a researcher to minimize error by collecting data from the same source but through different methodological designs. Denzin (1978) referred to this as a *between-methods* triangulation relying upon the inherent value of both the quantitative and the qualitative, while accounting for the weaknesses within each. As Creswell (2009) notes within his discussion of mixed methods as the “gold standard” of research designs, its explanatory power relies upon understanding that neither quantitative or qualitative can solely understand a problem or explain a phenomenon. Johnson, Onwuegbuzi, and Turner (2007) view mixed methods research as a powerful third paradigm that “often will provide the most informative, complete, balanced, and useful research results” (p. 129). When undertaken and when feasible, this research paradigm
provides superior research findings and outcomes (Johnson, Onwuegbuzi, & Turner, 2007, p. 129).

To accurately identify the status of property crime scene forensic processing and the factors that influence an officer’s decision to process such evidence, it became clear that while quantitative data would prove invaluable to assess the “rates”, understanding the factors associated with decision-making would require speaking with officers and allowing officers to express those factors through a dialog with the interviewer. What follows is a detailed overview of the sampling frames, sample size, methods selected, and the modes of data collection.

*Sampling Frame*

The sampling frame consists of officers who registered for courses at the Southern Police Institute (SPI) and that of their respective agencies. Under ideal circumstances, a true national random sample would have been preferred. However, the fiscal reality of such a design could not be met. The decision to utilize the SPI as a sample frame originated from experience working for the prior director of the institute, Dr. William Walsh. During my tenure with the institute as a researcher, I was able to interact with officers completing the training curriculum and noted that they were diverse in location and SPI has records dating back to the start of the training program.

The original database contained over ten thousand email addresses. While it was extremely exciting to have the potential to undertake one of the first large scale, law enforcement surveys using email requests and an internet survey modality, there was no feasible way to ascertain which email addresses were still valid. Unlike traditional mail surveys, it is not practical to determine if an address is still valid beyond “failed to deliver” notifications, which only reflect if the email address has been turned off at the server level. It is entirely likely that an
email address could deliver the survey but the respondent could no longer have access to the email address (i.e., departed the agency).

To overcome this limitation, it was decided to select a period comprising the last five years and would select only those who enrolled at the institute. This strategy reflected the belief that those most recent emails and those who enrolled and therefore received email communications from SPI, would be the most likely to still be valid. This consolidation brought the original list of potential respondents with email addresses down to 4,677 reflecting those who both enrolled at the institute and possessed a complete email address. Duplicates were removed from the sample, leaving 4,354 potential respondents.

Following the distribution of the first wave of participation requests, it was discovered that nearly 1,400 emails were undeliverable, indicating addresses that were no longer active. This was concerning as only those emails selected in the last five years were selected and only those who enrolled and completed SPI courses. The implications of this were profound in that over 25-percent of the potential respondents were no longer active at their respective agencies. Moreover, nearly sixty of the emails were auto-returned indicating the respondent was “deployed” and was not at the agency, indicating a new point of contact. In these cases, those individuals were removed from the total sample. Following the first wave and subsequent removal of invalid email addresses on the second and third waves of participation requests the final sample contained 2,893, indicting a final sample of 66% of the original sample.

Inclusion of the AACOP membership resulted from interactions with one of the interview participants, a Chief of Police, who believed the research results would prove valuable to the state and provided me contact with the Director, Daphne Levenson. Interviews were derived
from a research participation request made through the AACOP newsletter and through snowball sampling.

Sample Size

There were 460 completed surveys comprising the online survey system and those emails returned with a completed survey, indicated by those who requested the survey by mail, as they were not able to access the survey within their agency or encountered technical issues, and those who completed the online survey. The response rate was ~16% for this research.

Delivery Mode

The decision to utilize the internet as the primary delivery mode reflected the fiscal reality of what a mail distribution mode would cost. While not the primary choice of survey distribution, the internet has proven to yield adequate response rates (Dillman, Smyth, & Christian, 2009). Remark was the internet survey delivery system utilized for the research project.

To improve response rate and reduce the four sources of survey error (sampling, coverage, measurement, and non-response), Dillman’s (2000) Tailored Design Method (TDM) was incorporated into the administration of the survey when applicable. The TDM method suggests a three-email contact strategy involving initial email invitation and two follow-up emails. The SPI sample frame incorporated the TDM approach. The AAOCP interview sample frame involved distribution in the newsletter, which appeared bi-weekly.

Quantitative Method - Survey Research

The survey instrument incorporates a mixed method approach utilizing closed-ended and open-ended question formats, cognitive recall, and appreciative inquiry to facilitate obtaining accurate information (Dillman, Smyth, & Christian, 2009; Dillman, 2000). Portions of the survey
were modified from the PERF DNA Survey (Griswold, 2011). A central theme in this research and the guiding research question is the internal and external factors that influence an officer’s decision to process forensic evidence within property crime scenes. To understand the factors, it was highly important that respondents be motivated to participate and to accomplish this, the questions were designed to reduce any potentially biased statements resulting in a carryover effect, issues involving social desirability, and to ensure anonymity increasing accurate results and improved completion of the survey (Dillman, 2009). What follows is a detailed explanation of the survey mode.

The question format includes four category items comprising thirty-seven questions: agency information, lab information, officer perspective, and general information. The determination of the category items was partially based upon the PERF DNA survey and valuable input from law enforcement colleagues. The survey was pilot tested on a series of police officers, former and current chiefs of police, and two committee members who all provided valuable contributions and helped identify unfamiliar answer choices and assisted in the creation of additional questions, such as an officer’s familiarity with CODIS warrants. Below is a summary of the survey categories and question content. A complete copy of the survey is available in Appendix B.

Agency Information (12 Close-Ended Questions) - The determination to lead the survey with agency information would seek to determine the familiarity and experience the agency has with forensics. Questions within this subsection highlight the familiarity of the agency within DNA forensics, its utilization of the forensic analysis specific to property crime scenes, current forensic policy, and sources of any potential backlogs. Prior research would suggest that
agencies with more familiarity with forensic analysis and more integration of the practice into
the agency would be more likely to expand evidence collection into property crime scenes.

*Lab Information (3 Close-Ended Questions)* – While brief, the purpose of this subsection
was to determine who performs DNA analysis for the agency, the accessibility of the facility and
the quality of the interaction and communication between the agency and the forensic lab. As a
primary stakeholder, it became important to understand the relationship between officers and the
facilities that they utilized as prior research had indicated the lab as a source of influence.

*Officer Perspective (10 Close-Ended Questions and 1 Open Ended Question)* – The
questions within this subsection specifically focus upon the officer’s experience and that of the
factors that influence their decisions. Themes within the subsection include, current utilization of
forensic evidence, perspectives on the expansion of forensic collection to that of the officer,
benefits of forensic analysis specific to property crime scenes, an analysis into challenges of
forensic analysis at a practical level (training, crime scene contamination, identification of
evidence, etc.), influence of stakeholders, factors associated with the decision to collect evidence
(modified from Strom and Hickman (2010), and lastly the familiarity the officer has with the
“DNA Field Experiment: Cost-Effectiveness Analysis of the Use of DNA in the Investigation of
High-Volume Crime”. Each question was designed to specifically understand decision-making
while accounting for financial constraints. This section measures cultural, organizational,
institutional and personal factors associated with the officer’s decision to collect and process
such forensic evidence. The open-ended question attempts to collect incidents where the
collection of property crime scene evidence could have prevented a subsequent violent crime.
This was a later addition to the survey, originating from an interview with an officer who
indicated such a case and how it influenced him to be more active within collecting evidence
within such cases. The use of the open-ended question at the end of the subsection includes elements of appreciative inquiry to improve response rates. While open-ended questions yield lower response rates than closed-ended questions (Dillman, 2009), framing the question by recognizing the knowledge only the respondent has and their importance, is highly likely to increase participation (Whitney & Trosten-Bloom, 2003).

*General Information (11 Closed-Ended Questions)* – This subsection contains general questions concerning the respondent’s demographics (age, gender, education level, and years of service) and that of the agency, including agency type, size, state and specific questions on community make-up and social class that agency serves.

*Statistical Analysis*

The intended purpose of the study is to be descriptive in nature. While the survey results could certainly be used to predict police officers’ evidence collection intentions, this would put the “cart before the horse”. Currently, few research projects have sought to specifically focus on the factors that influence an officer’s decision to process DNA forensic evidence. Current practice within DNA forensic evidence has often become required (e.g. cases of sexual assault). While historical research provides some factors, few studies within DNA forensic evidence have sought to collect and collate those influences. After careful discussion with several committee members, the decision was made that the study should be used to inform policy makers, to move forward the discussion within the expansion of forensic analysis and to identify additional factors through the mixed method design. If an entire set of influences were identified, and it is the intention of this dissertation to illuminate many of those influences, the research results would assist future studies. Therefore, the focal emphasis on the statistical analysis is to *describe* the
state of forensic analysis within property crime scenes and identify the factors that influence an officer’s decision to collect such evidence

**Quantitative Method - Interviews**

This data source consists of interviews with police officers, LEO executives, forensic experts, and prosecutors. The interviews were conducted using an open-ended, semi-structured conversation technique, which allows the participant’s first-hand knowledge to become a focal point of the conversation. The sampling strategy utilized within this data source comprised purposive sampling and snowball sampling. Through a combined effort of my committee, a participation request distributed by the AACOP, and the assistance of my law enforcement colleagues, I was able to develop an interview sample comprising all stakeholders within the investigative process from across the United States.

**Interpretative Phenomenological Analysis**

The guiding philosophy within the qualitative component was to understand the perceptions of officers and additional stakeholders within the investigative process and the relationship between the expansion of forensic evidence within property crime scenes and how such an expansion would influence the investigative process. The decision to utilize interpretative phenomenological analysis (IPA) as the guiding qualitative method was to tap into the participants knowledge, to highlight their perceptions, cognition, experiences, and most importantly the personal accounts (Smith & Osborn, 2003). IPA acknowledges that experience is a combination of cognition and perception and that to understand a phenomenon it is vital to allow the participants experience to frame the study. Within IPA, there is no theory to frame the interviews nor is there a predetermined hypothesis (Smith & Osborn, 2003). Through the interviews, a set of themes will emerge. These themes allow for a pragmatic approach to
understanding the phenomenon. As Smith and Osborn (2003) state, the power of IPA reflects in the ability for the researcher and reader to take into account their own experience (personal and professional), the findings of the research, and the current literature to better understand the phenomenon. As the intent of this research was to offer a pragmatic examination into the state of forensic analysis and the intended audience, that of practitioners and policy makers, IPA provided a unique methodical approach.

A reader could certainly question the use of IPA within the current study. Its utilization within criminal justice has been limited but has become increasing utilized, when ethnographies are not suitable and a more rigorous and in-depth analysis is preferred. Smith and Marshall (2007) undertook the method when examining barriers to effective treatment for street-level prostitutes. Most recently, McLean and Marshall (2010) examined police officers’ perspective of mental health issues and services. As this research is designed to examine officer and stakeholder perspectives of forensics evidence within property crime scenes, it seems appropriate to incorporate the method within the dissertation.

As the sample frame utilized purposive sampling, IPA affords a researcher to undertake an in-depth examination while maintaining a practical application. That is to say, IPA does not require a large sample size nor establishes a minimum sample size. IPA is bound to the participants, and most importantly those who agree to be included and therefore attempts to acquire the entire range of experience the participant holds (Smith & Osborn, 2003). In this regard, IPA sacrifices breadth for depth (Smith & Osborn, 2003). However, the thematic expression of what the qualitative study reveals via IPA can produce a detailed analysis, rich with exploratory and explanatory power. At a practical level, IPA includes a specific methodology for interviews, which includes guidelines, methods, and techniques to ensure that
any findings can be supported through the interview process.

*Interview Sample and Summary of Interview Process*

Participants were recruited through two primary paths: participant requests within the AACOP newsletter and snowball sampling originating from current contacts. While IPA does not require a minimum sample size, the reasonableness associated with attempting a large sample can overwhelm a researcher who is new to the method (Smith & Osborn, 2003). As such, it was decided that the sample size would reflect the current recommendation by Smith and Osborn (2003) for early practitioners within IPA, a sample size of three. As prior research noted that officer decision-making is not reserved to the agency; additional stakeholders were included within the interviews. The final interview sample included the following: Police Officers (n=3), Law Enforcement Executives (n=3), Prosecutors (n=3), Forensic Experts (n=3). In concert, the perspectives of those within the investigative process reflects a moderate sample size for IPA (n=12) (Smith & Osborn, 2003).

As discussed prior, forensic analysis is currently a “hot media topic”, as such to improve reliability and facilitate in more meaningful dialog with participants, individuals were assigned pseudonyms. Pseudonyms were assigned according to the position of the individual. For example, Forensic Expert #1 became Frank, Police Officer #1, became Powell, and this continued for each participant within the project. Table 4 provides the background information of each participant.
Table 4 – Participant Overview

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<th>Participant Name</th>
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<th>Agency Type</th>
<th>Years of Service</th>
<th>Higher Education</th>
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<td>21</td>
<td>Professional</td>
</tr>
<tr>
<td>Parker</td>
<td>Prosecutor</td>
<td>Female</td>
<td>Medium Suburban</td>
<td>10</td>
<td>Professional</td>
</tr>
</tbody>
</table>

While there is no set collection method, the recommended approach is a semi-structured interview with one or two broad questions to develop a two-way dialog and establish early rapport with the participant (Smith & Osborn, 2003). Most important within the data collection is that the interview is not an interrogation, the purpose is to maximize the opportunity for the participant to express their expertise (Smith & Osborn, 2003). In developing the questions, it is important that they be neutral, avoid jargon or assumptions of technical proficiency, and be developed to facilitate in an in-depth examination of the participants experience (Smith & Osborn, 2003). While open-ended questions are preferred, the use of closed questions is acceptable in such a way as the intent and context are to engage the participant to continue within the dialog (Smith & Osborn, 2003). What follows are the questions used across each of the participants. It should be noted that all interviews began with a statement of confidentiality and anonymity, and a general question concerning each participant’s background was asked.
Police Officer

- Can you walk me through a typical property crime scene call?
- Under what circumstance would you make the determination to collect DNA evidence?
- What do you think of the recent developments to expand evidence processing within property crime scenes?
- As a police officer, where do you believe you are most influenced to process forensics evidence at a property crime scene?

Law Enforcement Executive

- What is your outlook on forensic analysis within property crime scenes?
- What do you think of the current focus to expand property crime scene forensic testing?
- How can we improve forensic analysis within property crime scenes at the agency level?
- What do you think of the recommendation that officers collect forensic evidence?
  - (If needed) Do you believe your officers are prepared to collect evidence or should they be responsible for evidence collection?

Prosecutor

- How influential is your department in having forensic analysis completed [Follow-up: Property Crime Scenes]? 
- How do you believe the expansion of forensic analysis into property crime will affect your department?
- What do you foresee as potential benefits or consequences in such an expansion?
Forensic Experts

- What changes do you believe are necessary to expand forensic analysis into property crime scenes as a routine investigative practice?

On average, each interview ranged between 45 minutes to an hour, with the longest interview exceeding two hours with a Law Enforcement Executive whose agency was very familiar with DNA forensics and wanted to share their innovations and their challenges. All interviews were conducted over the phone or via Skype at a time requested by the participant.

Analysis of the Interviews

The interview process included a transcription of each session, completed during the interview, as it was not feasible or authorized by participants to have a digital recording of the interview. Under ideal circumstances, it is preferred within IPA to have a recording to which you can listen and identify themes (Smith & Osborn, 2003). However, in speaking with several participants during selection, many requested to not be recorded. The most common response was that some of what they would discuss could be viewed negatively if identified back to their agency. For example, Lee discussed an innovation within the agency that rewarded officers for collecting forensic evidence at a scene, which was an innovation even the higher command staff was unaware of and if it became public knowledge, they would face considerable scrutiny.

As their expertise was invaluable to the study, and as a condition of their inclusion into the research, the decision was made to not record the interviews, which proved to be a challenging venture. Following the first interview, it became apparent that a noise-cancelling headset would be vital to the success of the interviews or at the least muting and unmuting the phone to reduce the background noise of the keyboard. During the first interview transcription, the participant would pause and ask, “If I was able to get that”, or would seek confirmation, if
only to see if I was following along. I suspect this was a result of the clicking sound of the keyboard, which was distracting them. Following the first interview, I transitioned to a Bluetooth headset, with noise canceling technology, which seemed to eliminate the issue during subsequent interviews.

Expressing Themes

Smith and Osborn (2003) provide a framework for IPA, which involves reading the transcript closely and multiple times to become familiar with the participants account. Through multiple readings, additional themes may become identified, which may reflect within identifying the structure of the participants answers (how they answered the question) or the use of code switching within the dialog they used. For example, during one interview, a forensic expert and former police officer would transition between speaking as a scientist (objective), to recounting cases and the importance of expanding forensic evidence into property crime scenes because of the cases he worked and seeing victimization first hand. With each read, I became more familiar with the experiences of the participants and how they viewed the expansion of forensic evidence and the factors that influence their collection practices.

Following transcription of the interviews and collation within AnSWR, thematic analysis occurred, which were input into Microsoft Excel. The resulting analysis produced long lists of themes, to which I was able to cluster many of the themes to create superordinate themes. Of importance in the thematic expression is that the first stage of analysis involves creating concise phrases from the text and the secondary analysis produces abstraction of the phrases, which can be expressed as themes. Take the following analysis of “Frank” the forensic expert.

**Interviewer:** What do you think of the current state of forensics?

**Frank:** What we have right now is just not working, we are inundated with evidence and bogged down in testing marijuana (pause)... they keep sending us
evidence, want us to travel 1-2 days to testify, and then expect us to be on call to collect evidence. Then we are blamed when a mistake happens. We need a smarter process in place.

In the analysis, I noted frustration, lack of control over time management, frustration with the internal (organizational goals and values) and external (political, police agency, and prosecutorial) pressures on prioritization, and directed anger. In concert with the additional analysis, I was able to express two major themes reflecting the current literature: Overburdened Crime Labs and Ineffective Forensic Process. Of importance is that within the analysis, the entire text becomes data, but it is not expected that each sentence will generate a theme. The clusters that form and the themes that emerge are interpretative in relation to the researcher, which requires that the researcher continue to return to the transcript to ensure that what becomes expressed reflects the true intentions of the participant. Once the phrases are clustered, the themes identified, it becomes possible to create superordinate themes. These reflect as top-level themes or “Global Themes”.

In what is likely more familiar to a criminal justice reader is the analytical process of thematic networks. Attride-Stirling (2001), offers a set of analytical tools to aid qualitative researchers, which enables a researcher to create web-like illustrations, expressing the findings of the researcher by leveraging the themes discovered during the interviews. As Attride-Stirling (2001) notes, the development of the thematic network begins by identifying basic themes, moves to organizing themes, and then into a global theme. Important within the model is that many global themes may result (p. 389). Of importance within the structure depicted is that the basic themes may connect with additional organizing themes, which are then expressed into global themes. By using this approach, the researcher is able to provide a very detailed and visual depiction of the interviews.
Limitations of Design Study

Concerning the survey research, the intended design was meant to limit the four sources of error (coverage, sampling, nonresponse, and measurement). However, because of the sample frame and mode of delivery, this research does incur coverage error and nonresponse error. The accuracy of the study reflects at the 95% confidence interval with an error level of 4.3% (A final sample removing incomplete data of 441) and a response level of 15%. The use of the mixed-method design provides ample explanatory power to reduce the weakness within this quantitative component. Ideally, a true national random sample would have been preferred, distributed via mail, and incorporating TDM (Dillman, Smyth, & Christian, 2009). However, such a design was unattainable and the intended design does incorporate a mixed-method approach to address the obvious weaknesses within the quantitative and qualitative measurements.

In addition, some critics could offer that there is an official source of data on the status of property crime scene processing within the CODIS funding program. Any agency that receives federal funding is required to provide statistics concerning DNA collection, including the number of items pertaining to property crime scenes. While this would provide strong support for the status of evidence collection, it would have reduced generalizability in that only agencies that receive funding are required to submit such reports. Likewise, data collection of this type would also miss those agencies that collect but do not process such evidence, “simulating evidence collection”.

The use of IPA, while important, is a potential source of concern. It was not possible to record interviews, and while transcription did occur, it very often involved shorthand to keep pace with the participants. As such, thematic expression could be limited because of the nuances

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8 The practice of simulating evidence collection is discussed within the findings section.
missed within the speech patterns and specific use of certain words. For example, during one interview, a police officer would use the word complainant, if then only to correct the term with citizen. The word victim was never used. In reviewing, the transcription of the interview, this would have been missed, had I not noticed it during the interview and specifically highlighted it as an important element. The purpose of any research is to be valid and reliable, and specific to the qualitative component, it should establish trustworthiness, reflecting in credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985).

To ensure credibility, it is recommended to allow participants to review the transcripts or notes of the researcher for verification (Lincoln & Guba, 1985). While this is a suitable method to increase credibility of the findings, I found it limiting in that aspects of social desirability could certainly influence participants analysis of the dictations that had occurred. That is to say, in reading their interview they may deem a line of answers as possibly being something they ought not to have said. As an alternative, during the interviews, I would notice key statements that reflected the literature or emerging themes and would state them to the participant for confirmation. At first this proved challenging, but as the interviews progressed and I became more familiar with the interview process and themes expressed, it became easier to verify what was expressed by the participant and what I noted was valid.

Transferability relates to the generalizability of the participants selection, which is to say, will the sample interviewed transfer to other similar populations. As this research utilized purposive sampling, a component of transferability (Lincoln & Guba, 1985), the sample includes officers from across the United States, reflecting different agency sizes, a wide range of experience, and educational backgrounds. The one limiting factor within transferability is the limited participation by females within the research. Ideally, it would have been preferred to
have two female and two males participate within the interviews across each stakeholder category to ascertain if gender influences an officer’s decision to collect evidence within the scenes.

Dependability and conformability are interrelated concepts, wherein dependability examines the process of inquiry and confirmability examines the validity of the findings (Lincoln & Guba, 1985). While mutually exclusive, these concepts are interrelated and can be confirmed with a rigorous assessment process (Schwardt, Lincoln, & Guba, 2007). To that end, it was important to use a debriefer. A committee member was selected as the debriefer, because of her familiarity with the IPA process. Following interviews, a discussion would occur concerning how the themes were identified and the process of expression was validated. Furthermore, the interviews were conducted before the results of the national survey were analyzed. This was a purposeful decision to remove any potential for interpretations to be influenced by the results of the survey.

Despite incorporating three methods of analysis into this dissertation, it is important to highlight that there are limitations and potential sources of error. It is the intent of the mixed-method design to overcome these potential weaknesses and enhance the reliability and validity of the study through convergence of the data. Further validation would be reinforced through the officer survey and the detailed IPA interviews. In this manner, there is always a cross validation of the findings. If the survey research denotes little influence by the prosecutor’s office concerning forensic analysis, and all participants reflect the same, it can be said that the prosecutor has limited influence on an officer’s decision to collect such evidence. Likewise, when there is a divergence within one or all of the modes, it is important to understand how such a divergence could occur.
Summary

This chapter discusses the methods undertaken, the rationale, and the potential limitations of the study design. In writing this chapter, I became quickly aware that no study is perfect. It is not feasible to design a perfect study, there are always going to be sources of error or perceived weaknesses. The goal of research is to select the design best suited to answer the question. As I reflect on the study design, I recognize the inherent power of the mixed-method paradigm. The use of such a method has great explanatory and exploratory power, but does require considerable knowledge and expertise to bridge the methods into a powerful research design and to interpret the findings across three modes. The decision to incorporate these two overlapping methods will offer insight into the current state of forensic evidence processing pertaining to property crime scenes and the factors that influence officer decision-making. Additionally, this research offers policy makers a straightforward approach in which to design and implement changes to improve their forensic practices.
Chapter 5

Research Findings

The purpose of this chapter is to report the results of the national survey and stakeholder interviews. This chapter is subdivided into three areas. The first section provides the detailed analysis of the stakeholder interviews, analyzed with interpretative phenomenological analysis. The decision to present this information first is to establish the context within the factors that influence an officer’s decision to process or ability of a stakeholder to influence evidence collection within property crime scenes and provide context for the later presentation of the national survey results. Moreover, this process will greatly assist the reader in better understanding the presentation of the thematic tables with specific context originating from the interview synopsis. The second section describes the results of the national survey. Section three collates the findings of the qualitative interviews and quantitative survey results into a mixed-method presentation of the findings to indicate areas of interaction and disconnect in what was reported. The relative strength of those factors emerging are then said to be highly influential when reported across both methods or exploratory when expressed within only one method.

Section One: Stakeholder Interview Results

As described within the methods section, the fifteen interviews were conducted across the investigative stakeholder continuum, comprising patrol officers and detectives, police executives, forensic experts and technicians, and prosecutors. The analysis of the results utilized interpretative phenomenological analysis (IPA). As the direct benefits of IPA were prior explained, it is important to denote that the following analysis does not contain the complete transcripts as compiled. The raw interview material contains information that would allow identification of the individual, and presentation of such information in this manner is not
suitable vehicle to inform the decision-making process and subsequent influence on police
officers. Subsequently, each interview is written to aid readers with understanding the organizing
and global themes. Block quotes were utilized to stress important themes and a guiding narrative
complements the expression of the global and organizing themes.

To assist in the presentation of the organizing and global themes, section one is
subdivided into four areas reflecting each of the investigative stakeholders: Police Officer, LEO
Executive, Forensic Expert, and Prosecutor. Each subsection then contains the interview
synopsis with direct quotes from the interviews and ends with a thematic table containing the
influences as expressed by each stakeholder. It is important to again note that each person
interviewed is identified with a pseudonym and any specific information that could be used to
identify the person has been removed. This decision proved incredibly important as discussed
later in the interviews, as an incentive program discussed would place considerable scrutiny and
criticism on the officer and agency in how they have innovated to improve forensic evidence
collection. Moreover, it was discovered that some agencies, even with clear and viable forensic
evidence, were greatly inhibited to collect evidence at property crime scenes. What follows are
the interview summaries, thematic tables, and expression of unique themes.

*Police Officer Interviews*

The officers interviewed reflected a broad range of agency types and years of service.
The minimum education for any of the officers was an undergraduate degree and the highest
reflected a graduate degree (M.S. or M.A.). All officers interviewed within the research were
male and held positions as patrol officers or detectives within each organization. The following
table provides the participants information.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Role</th>
<th>Gender</th>
<th>Agency Type</th>
<th>Years of Higher</th>
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</table>

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Powell – Detective

Powell possesses a considerable degree of familiarity with genetic forensic evidence, he has been for the past twenty years an officer in a large urban agency, and currently is a detective within the special investigations division. Powell had responded to an open interview request with a high degree of eagerness to participate. From our first interaction, it was clear that Powell would provide a wealth of insight into the topic reflected in his candidness on his organization and most importantly their forensic policy. The agency that Powell works for has engrained within their standard operating procedure the requirement to collect forensic evidence when present at a scene. I was immediately intrigued what prompted such a policy and the below excerpt provides a backdrop to the high utilization of genetic evidence in property crime cases.

“The policy began with an incident involving one of our officers, while off-duty and on the way to an ATM, he was robbed at gun point and taken to their car. As they shoved him into the car, he was able to get his weapon and shoot one of the individuals, both escaped. Blood was collected at the scene, it was processed, but there was no hit. Years later, we continued to check for a hit and we received a hit in the system two states over. The individual was arrested on a marijuana charge and apparently they require that DNA is collected. He was extradited, charged with robbery and attempted murder, and from that moment on we have been collecting and processing forensic evidence and adjusted our policy.”

As Powell described the incident, there was a clear sense of how the incident had influenced the other officers. However, enveloping what is a complete forensic collection protocol within the agencies standard operating procedure (SOP) certainly must have faced some resistance. As budgets are certainly on the minds of the administration, I had asked if there was

<table>
<thead>
<tr>
<th>Name</th>
<th>Service</th>
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<tbody>
<tr>
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<td>Paul</td>
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<td>Graduate</td>
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<table>
<thead>
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<th>Name</th>
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<tr>
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<td>Patton</td>
<td>Police Officer</td>
<td>Male 10+</td>
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<tr>
<td>Paul</td>
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</tr>
</tbody>
</table>
any resistance within the organization, as Powell stated, “Money is always tight, but this was one of our own; the entire organization was behind the transition.”

After explaining the policy, I had inquired about the process. Powell explains the process for a typical property crime call.

“Because evidence collection is routine, the responding officer will make a decision if there is suitable evidence and if there is, he will call out an evidence technician, which can be either an on-duty officer or a civilian, we use both. If the evidence is viable, it is collected and processed.”

With a SOP centered collection practice, Powell does not believe that victims or the prosecutor have any influence on the decision to collect evidence. Rather, they look internally and expect processing to occur in cases. The following excerpt reflects this sentiment.

“If the officer is not calling out an ET for evidence collection often, I want to know why. Maybe he is not trained how to identify evidence or properly assess the quality of a sample, but if there is evidence the expectation is a full forensic response.”

With clearly high utilization of genetic forensic collection and processing within property crime scenes, I inquired about the costs of processing. Powell jokingly responded that “there is always a cost; you just have to ask yourself if it is worth it.” To Powell, the agency had very poor hit rates or success rates with DNA evidence within property crime scenes, but that was unimportant. According to Powell, “you play the odds”; we collect now, in hopes that it helps us later.

With such marked use of the practice, the funding to support it, and the institutional buy-in within the organization, it became clear that the next level of discussion would need to highlight the forensic lab. With such marked utilization and routine practice, Powell had noted, “It is not uncommon to shut down a house” for processing. The process could take thirty minutes to a few hours, wherein the evidence technician would process the entire scene looking for viable
samples, collecting those samples, and then processing those samples. Of importance within how Powell describes the agency’s collection practice and his perception of the benefits, is the reality that the agency has the benefit of having an in-house facility that is capable of processing a multitude of forensic evidence, including traditional physical forensic evidence and computer forensic evidence.

Despite the clear utilization of this evidence type and the routine collection practice, there had to be a limiting factor, some factor that inhibited the decision to collect evidence at these scenes. It seems within the agency, training and the reality of patrol work becomes the primary inhibitors. The following excerpt provides some insight into this issue.

“We have the resources to process scenes, what we have to continue to improve is recognizing evidence…. I just had an officer responding to a robbery at a convenience store that did not collect the big gulp cup that the person threw as they ran. We continue to see these things happen when the responding officer either overlooks evidence or as it commonly happens is trying to get to the next call in the queue.”

At this level, training to identify viable evidence is incredibly important. Despite the agency possessing considerable resources (funding, in-house lab, available evidence technicians) one of the limitations is clearly training as Powell states, “If they cannot identify it, it does us no good to have this policy.” This is an important point because the decision to collect then becomes considerably reliant on not the resources of the agency but rather the ability for an officer to recognize what is viable evidence, quickly, to then call out the evidence technician for collection. Additionally, Powell had noted that there is pressure on the responding officer to take the report, do a quick assessment, and then move onto the next call in the queue. Most important within this pressure is that it originated not from administrators, but within the patrol officers. Powell expressed this rather succinctly, “Someone else is covering your calls when you are stuck at the scene waiting on the ET [Evidence Technician].”
As I concluded the interview with Powell, I had inquired on the challenges that agencies and cities will face as forensics becomes more engrained within law enforcement beyond violent crime. Powell offered this final point, “It [the expansion of forensics into property crime scenes] is great for the agency but the outcome for the system not certain, I look at it this way, why limit police effectiveness, to reduce strain on the system.”

Summarizing the interview with Powell, the wealth of insight and reality that the agency has a SOP-centered collection practice is phenomenal. However, despite all of the resources, there are intrinsic influences affecting the officer’s decision to collect. The reality of police work and pressures to “share the load” of calls does influence an officer. Additionally, officers who lack training on identification of evidence may miss important evidence and the expectation of full forensic processing means that if an officer is not using the evidence technical at calls, the question becomes, “why”. It became equally feasible that officers would collect evidence aware that its viability would be quite low to ensure that they were actively pursuing forensic evidence. This is a point of contention acknowledged by the forensic experts.

*Patton – Patrol Officer*

Patton is the former Chief of Police of a midsize agency, and current part-time patrol officer with a tri-county consolidated agency. Patton had transitioned into the part-time position as he pursued his PhD. The current department that Patton works is comprised of three overlapping city agencies that consolidated resources to reduce costs, which includes an interoperability agreement allowing officers to affect arrests in any of the three jurisdictions. As a result, there are approximately ten officers on at a time. While consolidation was not uncommon to hear about, I was interested specifically in how consolidation could influence forensic practice; the following excerpt provides detail into this area.
“The consolidation was a bit of a mess, there was a lot of inconsistencies, policy that had to change as we were basically becoming a single department, when it comes to our forensic policy, the standards had to become uniform across agencies, meaning our training, procedures, and policy all had to become singular. You can’t have one officer doing one thing and another doing something else, agreeing on policy was important and that had some influence on our current [forensic] practice.”

With the consolidation, the agency lost access to a dedicated crime scene person.

Moreover, through consolidation the agencies lost considerable resource allocations, which required going to the state for evidence collection. Patton expressed some frustration at this level.

“The state would take hours to come out to collect evidence, even fingerprints, and it was ridiculous. You could have an officer on the scene for hours waiting for a person to come out, so I trained a person to collect evidence and it saved officer time to tie them up on the scene. {Me: You trained them?} Yea, I am trained through the state on forensic evidence collection and back when I was a Chief, I would send my officers out to classes through the state MTU (multiple training units).”

As Patton explained, it became too frustrating for everyone involved to rely upon the state; they had lost resources, were covering what are three overlapping jurisdictions, and were entirely reliant on the state for collection and processing of evidence. This was further complicated by the reality that often a state technician would be sent not from the local district but from the closest district with an available technician. This could result in extended delays and was even more frustrating because as Patton describes, “We have a good working relationship with our district facility, they get back to us on our evidence but we do have to wait, which is just what happens with the amount of evidence they see daily, it is not uncommon to wait a few months for evidence to be processed.”

As was common in the interviews, the reality of a backlog was ever-present. However, as Patton noted, the backlog had little influence over if they collected evidence at a property crime scene. Once the officers were trained and certified on basic evidence collection, they were able to process basic scenes like burglaries, car thefts, but in cases where it was a violent crime or a
large scene with multiple samples, policy dictated that they would call the state facility for processing. As Patton explains, “We have to be cautious because of the defense, we are qualified to collect evidence but I am not certain we are qualified enough to meet the standards the defense would likely argue in a high profile case.”

As the interview continued, the conversation turned to victims and their influence on the officer’s decision to collect evidence, specifically those victims of property crime scenes. According to Patton, the victim became their primary influence. The following excerpt depicts just how influential victims can be on the process.

“The CSI effect has seen a tendency for... callers (Patton then changed the word to complainants, then changed the word again to citizens), to want to collect evidence. In the 90s we would look around for obvious evidence... and tell them” if we hear anything we will contact you” –noting what was done at the point. CSI came around and they [victims] believed we could do anything, solve anything, catch everyone, and it came expected to do the basics. Let me back up, we had to do the rudimentary to appease the citizen (...complainant). I did basic evidence collection and when I took a class on fingerprinting. When we went through the class, the instructor said, “If all else throw some dust around, to dust a little bit, for some PR. It is about pacifying them, they expect for evidence to be processed at the scene. Smaller communities almost need that community satisfaction component. Larger agencies do not need them. The gap is so small between the access to city government, so at a small agency we have to process and make sure the citizen are satisfied. WE {emphasis intended} have no buffer.”

The influence of victims on the process was something other stakeholders had expressed. However, Patton presented it from a uniquely different perspective, in that for most of the officers, the collection of evidence or in many cases, the simulation of evidence collected became necessary to appease victims. However, Patton offered additional points on genetic forensic evidence and the decision to collect such evidence as noted in the following excerpt.

“There is really no meaningful benefit thus far. Let me qualify that, we are not seeing any better hit rates, but it is the threat that comes with the physical proof, and is the best way to get them to crack. We use the threat of the evidence as a tool, we say “How long do you think it will take for the crime lab to link this to you?” and in our state lying in the
course of any offense class is another felony and we get to charge them the cost of crime lab work. It also helps that these guys have no idea what we can do with technology, I shouldn’t tell you this but we had an officer a while back put a man’s hand on the top of the photocopy, told the man it was a lie detector, and he confessed. The belief is that the crime lab can do almost anything – CSI perpetuates this myth that the science can do anything. The gap between what the average citizen has and the actual practitioners is immense, forensics is almost like magic. When you tell someone, that it is only a matter of time before forensics can solve this, it is the magic that it will link them and it is expensive so we tell them that we will charge them for the forensics or they can confess now and I can stop the paperwork, and they will confess because they will pay the bill to process the forensics.”

In summarizing my interview with Patton, I was reminded of the practical reality of what forensics provides. While it can be incredibly important at a national level (CODIS), pragmatically it is but a tool and officers will adapt to the tool and leverage the asymmetric knowledge difference. As officers became trained, they were more likely to collect evidence. Moreover, their decision to collect evidence at a property crime scene would reflect in any pressure from victims or the perceived expectation to collect evidence. In the end, the agency had increased its collection and processing of forensic evidence within property crime scenes. However, there was no perceived benefit to the expansion, as of yet, beyond community satisfaction and ability to leverage forensic evidence knowledge to assist in a confession.

Paul – Detective

Paul has a combined experience of over thirty years in law enforcement, is currently a detective in a large, metropolitan agency, and is nearing retirement. We sat down early one morning to discuss the state of forensics within his agency and the associated influences on an officer’s decision to collect such evidence. It was apparent immediately that Paul possessed considerable experience and familiarity within genetic forensic evidence as he immediately
identified the current limitations preventing his agency from pursuing property crime evidence processing.

“Being honest, a large issue for us is prioritization, we devote forensic resources to serious personal crime, and then there is the issue that we have no one to go out and collect and process – budget is an issue, there’s no money to investigate the case or send out an evidence tech. In some instances, we take property calls over the phone.”

As Paul continued to describe the state of forensics within the agency and the state, he had noted how recently two regional crime labs had closed, which had a significant impact on staffing and as a result, his agency had to fall back to the county for collection and processing. While this meant there was a closer facility to work with, it also incurred higher backlogs as a result because they lacked proper staffing, equipment, and in many cases training. While this was not a new addition to the research, it proved to open up another line of discussion that had not been discussed prior in any interview; not every county has a lab, so a single county lab can serve multiple agencies, which creates considerable problems as the following excerpt expresses.

“We have very fragmented police departments across the state, everyone treats forensics different. A statewide policy is lacking, we need one. The larger cities have the resources, the labs, and when you look at what the smaller agencies have it is like two worlds, if you are not in a large city agency, it seems impossible, when you really think about the pay, there is a real disparity in pay and expectations [ME: In what regard?] Grant money is available but the training is highly apprenticeship based and there is a backlog on evidence technicians becoming qualified. Our evidence technicians are civilians but then you get into the politics of it all, we wanted to hire a tech early this year, the money is there for officers, tougher to get money for non-sworn, we ended up with a few new officers and no tech.”

As I expressed the themes of the interview on subsequent reads of the transcript, there was an unfortunate reality; the political payout was greater for hiring more officers versus more evidence technicians. In talking with Paul, he offered that much of it came down to what they
reflected, “When you have an officer on the street, it says something to the community.”

Moreover, as Paul described evidence technicians are viewed as costly.

This relationship between access to a technician and use of that technician was a point that Paul discussed often in the interview. However, this created an additional complication as Paul discuses,

“You have probably heard a dozen times about the CSI effect, but you know, it has an influence on our decisions. When you have a violent crime, if there is evidence, you are going to take it, and there is really no influence on if we do or do not collect, but when you are dealing with property crime, we do a lot for PR, and it sits in the evidence room. Victims have influence. [ME: Are there any characteristics about the victims that have a larger influence?] Political affluency certainly has some influence.....and of course, the higher the financial loss, the more likely we are to call out a technician.”

I continued to return to the characteristics of the victim, but as Paul frequently noted, there is always going to be an influence based on where the victim lives. In his perspective, the type of community certainly has an influence and if the higher the status of the victim sees more influence to process, it was equally possible, but he would not state, that the lower the status of the victim, the less likely an officer would be inclined to call out for collection. The goal according to Paul is for the agency to be as effective as possible, in the end Paul offered that, “Crime is crime, a criminal is a criminal regardless of the type of crime committed, ultimately the goal is to treat evidence equally, but you are going to have to change not just the agency or even the officer, but the community must change as well in how it views crimes.”

To Paul the expansion and increasing use of technology is going to prove incredibly important but in his last closing point, Paul wanted to express how we must be cautious in how we apply technology to problems, and wanted to ensure that I was able to maintain this focus in my dissertation conclusion. I end here with the last excerpt from Paul.
“Technology is going to be the best thing but also a hindrance, we will need better trained officers, but then we have to think about the costs to hire, retain those officers. Something we rarely think about is how it changes the type of officer we have. I also think about can we [older officers] keep up. Even then, if we can hire officers able to use the technology, I am worried if we can retain them.”

**Thematic Expression**

The process that informs an officer to collect genetic forensic evidence at a property crime scene is shaped by the interaction between external factors, organizational factors, and personal factors. These factors independently and in concert are able to influence an officer’s decision to collect such evidence. As to be expected officer decision making is primarily influenced by the policy of the organization, which was a factor of the organizations size, budget, and call volume (interrelated). While much of the themes contained in the table reflect those common within decision making across any matter, there are several unique themes (points of influence). The unique organizing themes emerging from the interviews highlighted the influence of victims, perception of worth, and age of officer.

The ability for a victim to influence the decision to collect was both a product of the CSI effect influencing the victim and the expectation that if evidence was not collected it could result in a complaint. This resulted in discussions on “simulated evidence collection”, a term coined reflecting the decision to swab, powder, or collect nonviable samples to demonstrate that the victim received the full resources of the agency. In some cases, evidence could be collected with no intent of formally processing the evidence. Subsequently, it became important to discuss the status of the victim, which despite lacking specific quotes, it is entirely feasible and was expressed that if the higher the affluence of the victim can increase processing, it is feasible that a person within a lower socio-economic community could receive less forensic treatment. This is a point of discussion within the following chapter as a future research topic.
Concerning perception of worth, as a second unique theme, most important to highlight are the cases denoting how processing of property crime scene evidence was beneficial. However, it was the case of the off-duty police officer, which stands out as a very important theme and subsequent source of additional research. Here the entire policy of the organization was reformed around the specific incident wherein a fellow officer was victimized. To see an agency embrace full forensic processing of all crime types was remarkable. However, the reality that the agency possessed an internal lab certainly did facilitate the adoption.

The interplay between older and younger officers proved to be a unique organizing theme within the research. While age has typically been expressed as a factor within decision making, the unique relationship here factors in the ability for working relationships between the younger and more seasoned officers to influence the younger officers into processing evidence less overtime because of the reality of the call queue. Within the interviews, it became very clear that while perceptions of worth are influential, the reality of police work, signified by the ever present call queue can influence an officer to move on to another call or a task deemed more worthy of time.

The expression of the global themes, organizing themes, and organizing concepts are depicted in Table 6.

<table>
<thead>
<tr>
<th>Global Theme</th>
<th>Organizing Theme(s)</th>
<th>Organizing Concepts</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Victim Affluence (status)</td>
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<tr>
<td></td>
<td></td>
<td>Buffer Between Victim And Officer</td>
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<tr>
<td></td>
<td></td>
<td>Simulated Evidence Collection or Collection but No</td>
</tr>
<tr>
<td><strong>Lab Facility</strong></td>
<td>Expectation to Process</td>
<td></td>
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<tr>
<td>------------------</td>
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</tr>
<tr>
<td><strong>Lab Facility</strong></td>
<td>External Lab</td>
<td></td>
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<tr>
<td></td>
<td>Working Relationships</td>
<td></td>
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<td></td>
<td>Evidence Prioritization</td>
<td></td>
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<tr>
<td><strong>Evidence Technicians</strong></td>
<td>Availability of Technicians</td>
<td></td>
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<tr>
<td></td>
<td>Response Time of Technicians</td>
<td></td>
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<tr>
<td><strong>Prosecutor</strong></td>
<td>Influence Noted More Frequently in Larger Agencies</td>
<td></td>
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<tr>
<td><strong>Crime Scene Characteristics</strong></td>
<td>Easily Recognized and Viable Evidence for Collection</td>
<td></td>
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<td></td>
<td>High Value of Items Stolen</td>
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<td></td>
<td>Unique Scene (Similar MO to Other Scenes)</td>
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<tr>
<td><strong>Organizational Factors</strong></td>
<td>Policy</td>
<td></td>
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<tr>
<td></td>
<td>Standard Operating Procedure (Agency Wide – Collect if Present)</td>
<td></td>
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<tr>
<td></td>
<td>Officer Discretion</td>
<td></td>
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<tr>
<td></td>
<td>Informal Policy (Incentivized Evidence Collection)</td>
<td></td>
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<tr>
<td></td>
<td>Formal Policy (Check with Patrol Sargent)</td>
<td></td>
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<tr>
<td><strong>Organizational Commitment</strong></td>
<td>Command Staff Acceptance and Support</td>
<td></td>
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<td></td>
<td>Tragedy (Personal Experience or Reflection)</td>
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<td></td>
<td>Overlaps with Personal Factors</td>
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<tr>
<td></td>
<td>Institutional Buy-in</td>
<td></td>
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<tr>
<td></td>
<td>Future Focused</td>
<td></td>
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<tr>
<td></td>
<td>Perception of Worth – Property Crime</td>
<td></td>
</tr>
<tr>
<td><strong>Nature of Police Work</strong></td>
<td>Call volume (Relates To Availability Of Evidence Technicians &amp; Dedication to Time on Task)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incident reported over the phone</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incident Evaluation (Enough to pursue, suspect, specific items taken that are easily tracked, witness, resources to spare)</td>
<td></td>
</tr>
<tr>
<td><strong>Lab Facility</strong></td>
<td>Internal Lab</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Working Relationship</td>
<td></td>
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<tr>
<td></td>
<td>Evidence Prioritization</td>
<td></td>
</tr>
<tr>
<td><strong>Personal Factors</strong></td>
<td><strong>Training</strong></td>
<td></td>
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<tr>
<td></td>
<td>Academy Training</td>
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<td></td>
<td>Agency Training</td>
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<td></td>
<td>State Training</td>
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<td></td>
<td>DNA.Gov Training</td>
<td></td>
</tr>
<tr>
<td><strong>Nature of Police Work</strong></td>
<td>Perception of Worth</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perception of Victim</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reality of Call Queue Backlog and Sharing the Load</td>
<td></td>
</tr>
<tr>
<td><strong>Incentives</strong></td>
<td>Intrinsic Reward (i.e., Crime Fighter)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extrinsic Reward (i.e., Time Reduction)</td>
<td></td>
</tr>
<tr>
<td><strong>Officer Characteristics</strong></td>
<td>Age – Younger Officers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Older – Less Likely To Collect</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perception of Worth of Property Crime</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Personal Stories of Success</td>
<td></td>
</tr>
</tbody>
</table>
While not the intent of the research to rank the factors, rather the purpose here is to identify relevant sources of influence, it seems appropriate to indicate the organizing theme most expressed within interviews and that is the policy of the organization. As to be expected, agencies that possess a standard operating procedure for the treatment of genetic forensic evidence at property crime scenes made the decision making process that much easier and removed additional influences. If evidence was present, it would be collected, which was made significantly easier by the availability and response time of technicians. However, once the policy of the organization became that of officer discretion, the interplay between the external, organizational, and personal factors become of vital importance. Unique influences expressed within the police officer interviews is the influence of victims to collect, have collected, or to simulate evidence collection or collection without the intent to process to appease the victim or to meet the expectations that forensic processing has occurred.

*Law Enforcement Executive Interviews*

The interview participants for the law enforcement executives all possessed graduate degrees, over twenty years of law enforcement service, and ranged from a Patrol Sergeant to a Chief of Police. Of importance to highlight here is that agency size reflected each agency type, which proved incredibly beneficial. All participants were male. The following table provides the participants information.

<table>
<thead>
<tr>
<th>Participant Name</th>
<th>Role</th>
<th>Gender</th>
<th>Agency Type</th>
<th>Years of Service</th>
<th>Higher Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larry</td>
<td>LEO Executive</td>
<td>Male</td>
<td>Small Rural</td>
<td>20+</td>
<td>Graduate</td>
</tr>
<tr>
<td>Lars</td>
<td>LEO Executive</td>
<td>Male</td>
<td>Medium Suburban</td>
<td>20+</td>
<td>Graduate</td>
</tr>
<tr>
<td>Lee</td>
<td>LEO Executive</td>
<td>Male</td>
<td>Large Urban</td>
<td>20+</td>
<td>Graduate</td>
</tr>
</tbody>
</table>

*Larry – Chief of Police*
Larry is the Chief of Police for a small, rural police agency servicing a population of about 4500. The agency employs three full-time and four part-time officers and according to Larry is “extremely focused on DNA evidence.” The interview with Larry was rather brief in comparison to the other executives or even that of the officers, which is important to highlight not in the brevity of the content but rather the emphasis on a very specific influence that the Chief was incredibly interested to discuss.

The interview with Larry originated from an open request for interview participants and his email reflected his extreme interest to share his agencies comprehensive use of genetic forensic evidence. As Larry describes, “My agency is very active with DNA evidence both within property crimes and in personal crimes, if we see it we collect it.” Recognizing that Larry comes from what can only be described as a very small and rural agency was incredibly fascinating. Immediately, the financial reality sets in and it became important to understand how it was that the agency was able to have a rather standard operating procedure for dealing with forensic evidence. As Larry explains, “The costs are there, really you can never really get away from the costs but I believe it is important and if there is evidence, our task is to collect it.” As the conversation continued, Larry transitioned into discussing the relationship between his agency and the lab, “We have been fortunate to have a great working relationship with our lab, they do blood work for us but latent prints [tactile DNA] are not focused on, which has a lot to do with the fact that we had three crime labs close recently.”

As Larry further explains, there has been considerable financial constraints within the state, which has resulted in a decrease in lab facilities and total services provided by the state. In fact, as Larry describes, “We can send out evidence and it could take 18-months, with no suspect identified, maybe 180 days with a suspect. If it is high priority, say a sexual assault, we could get
results in 90-120 days if we have a suspect in custody, if not it really depends on the lab.” As the
conversation continued, Larry expressed how the lab backlog is truly not an influence on his
decision or that of his officers to collect evidence at a property crime scene (or any scene for that
matter).

“There is always going to be a backlog at the lab, we still collect it, send it out, we just
end up playing the waiting game, which is more of a frustration for the county attorney
then us. It’s [DNA forensic evidence and property crime] going to pay off in the end.”

It was refreshing to hear Larry have such positive outlook on the practice, but it still
remained unclear what exactly contributed to the agency having such a standard approach to
genetic evidence collection. It is at this point that Larry expressed exactly what contributed to the
practice.

“If I had to pick the strongest influence, I would say it was the CSI effect [Me: Why is
that?]…There is not much to do in the area, so we have a lot of people that watch those
crime dramas, there is this expectation that DNA is everywhere. They want it collected,
they even expect that it is discussed in court. One of the first questions a Grand Jury will
ask is on DNA. They want to see it. What really started us collecting it at property scenes
was that the public wanted it, the lab makes it a low priority, but we still collect it.”

As we continued to discuss the influence of the victim, it became clear and Larry
affirmed that a large part of their policy is the reality that there is a direct line of communication
from the victim to him. There is no buffer zone to insulate the agency from the complaints, the
suggestions, or the requests of victims. For Larry and that of his officers, when they respond to a
scene, if they identify forensic evidence or even if the victim makes note of an item that is not
theirs, they will collect it, even if it is not viable for processing.

As one of three law enforcement officer executives interviewed, Larry highlights
specifically how financial constraints, while a limitation, are countered by the belief in the
inherent benefit of the evidence and the pressure they receive from victims. As I concluded the
interview, I began to wonder if the CSI effect is dualistic in that the community has a
misconception on the reality of forensic evidence but it is quite possible that the effect is in fact influencing officers and executives to collect information, because that is what a “Modern Agency” would do. The use of the term modern agency, originated here, as often in the interview Larry would acknowledge how modern the agency was despite their location and size. I note this here not as a criticism or as a negative commentary, quite the contrary, the policy of the agency and their focus on genetic forensic evidence collection and processing; do set them apart from other similar sized agencies. The primary influence at this level is a Chief (executive command staff) that has bought into the practice and has applied forensic policy to improve community satisfaction, the image of the agency, and in the long-run to improve information sharing.

_Lars – Sargent_

Lars is a sergeant within a small, suburban police agency with approximately twenty-five officers and possesses over twenty years of experience. Lars is a trained evidence technician and unlike other law enforcement executives or police officers firmly believes that the primary influence is not the agency, the officer, or the prosecutor, rather the primarily limitation is the lab.

“Training is adequately done for DNA and our first responders will do a preliminary assessment and they make the call if it should be collected, they may check with me or another sergeant but once the call is made, they can collect it. Now the issue is that we rarely collect evidence, even if blood is available it is still rare because the demand on the crime lab limits us greatly. We cannot push it [property crime scene evidence] because of personal crime priority, you know burglary evidence is just not a priority. In fact, we have two public labs, county and state, the level of priority is property crime dead last on the list.”

Demand on the lab facilities was an issue often brought up throughout the interviews. However, as Lars expressed, he believed that the agency was capable of expanding their collection into all scenes as expressed in the following excerpt.
“We could have a policy to collect it [DNA], we have no technical limitations, no major expense issues, no real resistance, we just have to fix the demand [on the lab].”

As Lars continued to explain, there was no real involvement of the prosecutor and the lab technicians from the country or state were always willing to come out and collect evidence when the officers were unable to handle or were not comfortable processing a scene, typically large scenes with multiple evidence types. The officers were adequately trained, and while there was minor pressure from victims, the agency rarely would simulate evidence collection. If they collected evidence, it was processed.

The relationship between collection and processing became a central focus of the interview following this point. According to Lars, the linking of collection to processing at a policy level was certainly a strong influence on the decision to collect. Within the agency when forensic evidence was collected, it had to be processed, which meant that an officer would either collect or have collected the crime scene evidence and would have it submitted for processing, but because of the prioritization it would receive the lowest priority and in some cases could be relegated to obscurity. As Lars describes, the turnaround time on property crime evidence could take months and the belief was that to inundate the lab with property crime requests could potentially cause the lab to treat other evidence types submitted by the agency as secondary. In essence, the lab could prioritize requests from the agency as non-priority because it was deemed that the agency was submitting property crime scene evidence. The perception of use was also a theme expressed within several other interviews, wherein there was an influence to not collect or send for processing evidence within property crime scenes so as to not appear to be “overusing the service.”

Lee – Patrol Sargent
Lee is currently a Patrol Sargent within a medium sized agency representing a population of 275,000, with a current staffing allocation of approximately 400 officers. Lee has been in this position for approximately ten years but possesses nearly 30 years of law enforcement experience from prior military and federal law enforcement positions. In describing the agency, Lee had acknowledged one current factor that influences their forensic collection practice and that is the four generations of officers within the agency, with a range from 1-35 years of service. The agency has been fortunate to have a wealth of experience within the agency, which has proved beneficial, but it has also proven detrimental to pursuing a more active forensic collection practice, as described in the following excerpt.

“If I were to describe our collection policy, I would say it is basic, we do not have a formal policy on property crime scenes. I have yet to see any specific property crime scene training. We have teams and each team has an expert officer that is assigned and trained to collect evidence but they do not handle the larger scenes (homicides, sexual assaults that are large, major accidents). Minor scenes are what they primarily handle.”

In a follow-up to the point on training, I had inquired why officers were not sent out to training and as Lee explained, the agency is already understaffed by approximately 50 officers and currently to send one officer away for training would see them fall below minimum patrol staffing. Additionally, the agency has witnessed a reduction in technicians or as Lee notes, “We are keeping officers but releasing technicians.” The decision to create the expert officer, trained on forensic evidence collection, was a direct result of the removal of several forensic technician positions. This officer works with the crime scene technician to help evaluate the scene and may collect evidence at the scene, but it is the primary responsibility of the crime scene technician. However, the availability of this person has become significantly reduced over the years as the following excerpt describes.
“We use to have a 24-hour crime scene tech- those positions went away—now normal duty hours and on call---if they do not believe they [the expert officer] can process it they ask the tech. One of the major issues for us is the budget, we have two budgets criminal investigative division and patrol division – CSI comes from CID – so what happens is that there may not be any more overtime budget for the month, which can limit sending out a tech even when they are needed." {ME: Does it really get that bad?} Got so bad, we had an officer who had to use a box of Qtips, unopened, to collect blood because no one was available.”

The financial reality was very apparent as also expressed in all of the interviews, but what Lee then explained was significantly more insightful on how the perception of property crimes are viewed within the agency. The conversation had initiated with the perspective of victims and the recognition that victims often ask for forensic testing, but because of the process used for incident handling within the cases, the victim is unlikely to have any real influence over the decision.

“For property crime scenes we use a point system to determine what is a workable case, if the case does not have enough points, a letter is sent to the victim saying at this point the case is unworkable.”

I was unable to ascertain the exact way the points are allocated but as Lee explained, like most agencies, the perception of worth for dedicating resources, including officer time is very minimal for property crime scenes, “they are viewed as the lowest of the scale, no one care to process the evidence.” Moreover, CODIS warrants were almost never issued on property crime scene cases not because the process required considerable resource investment, rather the belief is that there are already considerable warrants out and adding them for DNA recovered at a scene would only exacerbate the issue. For reference, the agency has approximately 20,000 warrants on backlog.

As the interview neared its end, the conversation had turned to his officers and their treatment of forensic evidence; it is here that I learned of an innovation that had originated years
prior, an innovation to incentivize officers for their collection and processing of forensic
evidence and subsequent “hits” within CODIS or AFIS. The following excerpt describes the
innovation and subsequent organizational issue.

“What I am about to tell you is not official policy, in fact I am quite certain that if it got
out we would face some considerable blowback for it. It started with taking prints; they
are such a pain to take. No one was collecting evidence, it was business as usual, so we
created an incentive. What happens is an officer gets 3-hours off if they get an AFIS hit,
meaning they get to go home early and there is no limit. We did this to get officers to take
prints. Works for CODIS as well. Been working for 3-4 years, but it is causing an issue
with the resources to process, [we] had to hire a person to just process prints and our
CODIS backlog grows.”

It was incredibly fascinating to hear of such an innovation to reward officers, which
certainly would influence an officer’s decision to collect or have collected evidence. It also
reminded me of how important anonymity was to the research and the reality that Lee had
revealed an informal policy that if known to the upper command staff, would pose a considerable
risk to those who created the policy. Moreover, the potential community backlash in
incentivizing, what the community believes as “standard” was a real risk. However, with the
development of the policy, there was an unfortunate organizational rift that formed between the
younger officers and older officers.

“The incentive program works, but we had this issue arise. New officers are processing
everything, but the older officers complain because they end up handling the cases.
Average scene can take several hours for larger scenes and a burglary can take 30
minutes to 2 hours to take photographs, look for fingerprints, speak to victims, canvas
neighborhood and as the older officers see, they are out handling the calls in queue that
the younger officers are unable to take because they are sitting at a scene. Then there is
the issue that the older officers do not see the benefit of processing.”

Despite the agencies informal incentive program, there was a disconnect between the
newer officers and the older officers, which would explain how despite the incentive program the
agency did not possess an active forensic program within these crime scenes. The reality of the
call queue, coupled with the resentment of the older officers, was likely limiting expansion of the practice. However, Lee provided an additional explanation for why the incentive was vital to the agency.

“We are a COMPSTAT agency, we use it, we have the meetings, we go over the rates, the hard data, which is what the higher-ups believe in but it limits forensics. We created the incentive because when we went to COMPSTAT, [evidence] collection went down, you get so focused on performance that forensic is an afterthought.”

In summarizing and expressing the themes within the interview, the new additions were innovations and policing model. I had not considered the influence of COMPSTAT on forensic practice. While Bayley and Dixon (2010) had briefly mentioned the influence of forensic on community oriented policing, the influence of COMPSTAT on the decision to process forensic evidence at a property crime scene must be considered and therein originated a new organizing theme.

**Thematic Expression**

The thematic expression of the law enforcement executive interviews exposed several familiar organizing themes across the primary global themes of external, organizational, and personal factors. Important within the expression of the themes within the interviews was the transition from street level bureaucrat to administrator, beholden to the bureaucracy of resource management, policy formation, contract negotiations, and community expectations. As was expected the reality of the budget had a significant influence within the discussion on policy formation or influence on officers to collect forensic evidence within property crime scenes. Budgetary issues were universally noted throughout the interviews. However, the budget was but one influence.
The unique themes expressed within the interviews reflected the interplay between the community expectations of what a modern agency should undertake, grounded within the CSI effect and the influence of the CSI effect on the organization and administrators who seek forensic collection to demonstrate modernity within the agency. Consider the small, rural, Chief of Police who despite a limited budget had facilitated in a broad collection policy for the treatment of any forensic evidence sample, regardless of crime type. A second unique theme that had emerged was the perception that increased use could result in seeing differential treatment of future forensic processing at the lab facility. This was expressed often within discussions concerning the lab backlog and crime prioritization within the lab, compounded by agency policy. A third unique theme had emerged reflecting the organizations policing model. The influence was expressed across all interviews in the influence of community oriented policing and COMPSTAT on the decision to collect forensic material. While COP seems to influence the small organizations, which lacked the buffer between the community and the command staff, COMPSTAT was suggested to undermine forensic expansion and routine collection. In the COMPSTAT agency, the lower level command staff had created an innovative incentive program to increase the collection of forensic evidence to overcome a lack of evidence collection, even within cases that contained forensic material.

Table 8 – Law Enforcement Executive Thematic Expression

<table>
<thead>
<tr>
<th>Global Theme</th>
<th>Organizing Theme(s)</th>
<th>Organizing Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Factors</td>
<td>Victim Influence</td>
<td>Limited Buffer – Direct Line to Command Staff – From Minimal to Significant Influence</td>
</tr>
<tr>
<td></td>
<td>Community Influence</td>
<td>Public Expects Forensic Analysis&lt;br&gt;CSI Effect&lt;br&gt;Crime Prioritization within the Community</td>
</tr>
<tr>
<td></td>
<td>Lab Facility</td>
<td>External Lab (Cost of Using the Facility, Expedited Costs for Rush Processing)&lt;br&gt;Evidence Backlog&lt;br&gt;State or County Labs</td>
</tr>
</tbody>
</table>
Evidence Prioritization

Evidence Technicians
Availability of Technicians

Prosecutor
Limited Influence on Command Staff

Organizational Factors
Policy
Available Funds for Policy (Standard Operating Procedure, Informal Policy)
Collect and Process Policy

Budget
Funding for Property Crime Scene Testing, Training, Technicians
Funds to Send out Technicians to Scenes (Overtime, On-call)
Hiring Officers vs. Hiring Technicians

Organizational Commitment
Modernity of the Agency
Enticing Officers (older and younger to process)
Future Focused – It Will Pay Off In The Future
Willingness to Send Officers to Training

Nature of Police Work
Call Volume (Relates To Availability of Evidence Technicians, Dedication to Time on Task, And Available Funding)

Lab Facility
State or County Labs
Evidence Prioritization
Working Relationship

Personal Factors
Training
Forensic Evidence Training

Nature of Being an Administrator
Fear of Losing Access If Perceived To “Overuse” The Lab Facility

Job Performance
Clearance Rates – Priority of Calls
Influence of Police Model (COP vs. COMPSTAT)

Incentives
Using Technology to Fullest Modern Agency

Officer Characteristics
Personal Stories of Success

Forensic Expert Interviews
The inclusion of forensic experts within the interview sample was incredibly beneficial to further understanding how the decision to collect evidence is significantly influenced by working relationships and the pragmatic expression of the multiple roles forensic experts undertake. The education experience ranged from graduate to professional degrees with one expert holding a medical degree. Years of service spanned from two to over twenty years of service within a small rural and large urban agency types. All forensic experts were male. The following table provides the participants information.
Table 9 – Forensic Expert Participant Information

<table>
<thead>
<tr>
<th>Participant Name</th>
<th>Role</th>
<th>Gender</th>
<th>Agency Type</th>
<th>Years of Service</th>
<th>Higher Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frank</td>
<td>Forensic Expert</td>
<td>Male</td>
<td>Large Urban</td>
<td>20+</td>
<td>Professional</td>
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<tr>
<td>Fenton</td>
<td>Forensic Expert</td>
<td>Male</td>
<td>Small Rural</td>
<td>2</td>
<td>Graduate</td>
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<tr>
<td>Fred</td>
<td>Forensic Expert</td>
<td>Male</td>
<td>Large Urban</td>
<td>16</td>
<td>Graduate</td>
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*Frank – Forensic Expert (DDS)*

Frank presented as a unique interview with a background encompassing positions as a patrol officer, police investigator, Forensic Odontologist, Oral and Maxillofacial surgeon, expert witness and a practicing defense attorney with a combined experience of over twenty years within a very large urban city. Deciding on how to best use his interview within the dissertation was complicated. Frank holds a DDS, JD, M.S. and considerable professional certifications. I decided that I would not place Frank into a category; rather I would allow the interview and the themes expressed to place him into one specific category.

After introductions and explaining the intent of the research, I inquired about the overall perception of genetic forensic evidence. Frank immediately and without hesitation started expressing the frustration within the lab, noted in the below excerpt.

*“The issue we face is the lack of spending by the state; there are not enough forensic experts. Think about all they have to do, they are required to travel, what can be one or two days, to be in the courtroom to testify, they are in the lab, in the field, and are often on-call to do all of these. We cannot put an officer on the stand [Me: Why?]...... the officer will not meet the threshold for the Daubert Standard, so we need the evidence technician in court, but the same technician in the court room is often the same that is going to be called for assistance at a scene, in court or on the way back from court, testing and court testifying is too burdensome to do both.”*

From the excerpt, it is clear how the multitude of positions that Frank has held reflect here. The reality of overburdened lab technicians and laboratory facilities is very clear within the literature, but what Frank expresses here is not so much the burden concerning the amount of evidence, rather the multitude of roles that the forensic technician is expected to fulfill.
Recognizing the increased expectations, I inquired about how this may influence decisions by the officer to call an evidence technician.

“Of course it influences the officer, you are working with these people, you rely on them to help you do your job. If they are overworked, even stressed, you may not call them out to a scene where evidence is likely present but where it is most likely not needed.” Often the reality of working relationships can go un-discussed at this level; here Frank offers that the decision to call an evidence tech can reflect in their working relationships with the technicians. Additionally, the ability for officers to recognize potential sources of evidence becomes important.

“I had a case I was working, a local robbery, patrol had worked the scene, and I was called out, in talking with the clerk he notes that the person had walked in with a Subway cup and left it on the counter, the officer did not think to collect it.”

Following this example, I had transitioned the dialog into specifically property crime scene calls. When speaking on the use of evidence within property crime scenes, Frank notes how there are a clear lack of awareness as to the benefits, which can have disastrous results.

“There is little to no dissemination of the benefits to collecting evidence at these scenes, we get officers at the scenes who contaminate evidence or just do not even notice there is evidence. Early in my career I encountered a car burglary where the only thing missing from the car was the registration, apparently the person used it to follow her to her home, DNA was at the car, we had blood from a cut forearm, it was not collected, never processed, about a month later the girl was raped at her home.”

Frank went on to offer additional examples, where evidence was not collected but none offered such the unfortunate reality that can result from a lack of processing, the rapist was never identified. As Frank would describe, property crimes are treated as unworthy of resources, they receive less time, less dedication, and as commonly is occurring, being “handled over the phone.” As the interview progressed, it became clear how his law enforcement and defense attorney experiences reflected in how genetic forensic evidence becomes used.
“DNA is important, but it is meant to only help us, we know how to investigate these cases but if we come to overuse it, horrible things can happen. Let me offer you an example, I offer to students when I teach, a few years back I had this case where a young man met this girl at the bar, and they went out to her car, they had aggressive sex, so much so that she had torn skin off his back, and he said that was enough and got out and left. Later that night she is found dead in the parking lot, head smashed in with a rock. You cannot pull prints of the rock, so we have evidence of sexual trauma, DNA belonging to the guy, and witnesses that see them leave and hear them having sex in the parking lot. Detectives go out, meet the guy, he admits having sex but come to find out she had a boyfriend, who had watched her outside the bar, got into an argument, smashed in her head, and the only way this comes out was because someone noticed him at the scene. They had a suspect, evidence tying him to the scene, and clear indication of some type of violence. The coroner report noted she had vaginal tearing. Had they stopped investigating, it is entirely possible that the prosecutor would have pursued the case.”

As this excerpt illustrates and as nearly every interview noted, forensic evidence is but another tool to assist the investigation, but it is not to be the “end all be all.” The institutional knowledge that the police and forensic technicians possess is vital to the successful resolution of cases. I had heard cases like this often in the interviews, but what later became important in the interview is that there was a clear sense of emotion, investment into the cases. It is at this point, that Frank expressed what was an entirely new set of themes, as highlighted in the following excerpt.

“The issues I see now is that the experts are becoming tools for the prosecution, technicians and experts are becoming emotionally involved and this is when mistakes happen, they see their importance in solving cases and see themselves as not objective, neutral, scientists but rather as crime scene investigators solving crime.”

In the interviews with the forensic technicians, this became very noticeable in how they view their role; they are not disconnected but rather become emotionally invested and seek confirmation, acceptance, and even admiration for their role in solving crime. To their credit, everyone seeks acknowledgement of their successes regardless of how minor their role.
However, here what is meant to be an objective, scientific tool, becomes enmeshed within the investigative process.

In summarizing the interview with Frank and expressing the themes within the interview, it is clear how his insight into the forensic process and associated issues proved invaluable. The expansion of genetic forensic collection and processing will undoubtedly add to the burden of the forensic technicians, which will influence the working relationships between officers and technicians. Currently, the perception of technicians as “crime solvers” may be providing the incentive to overcome their increasing burden. Frank offers that forensic technicians must step back from this perspective and become once again disconnected, this is an aspect that additional research must focus.

Fenton – Forensic Technician

Fenton is a young forensic technician, recently passing his forensic boards, with about two years of professional experience. He works on call for a small agency, part-time, as their lead forensic technician. His agency reflects a small rural agency, with about thirty-five officers, a very small executive staff, and about twenty-four patrol officers. The physical location of the agency places it in close proximity to the county courthouse, local jail, a public and private prison, and holding center for immigration detainees. With such close proximity and creation of specialized task forces, between two to three patrol officers are shared with other agencies as members of multi-agency taskforces, and several patrols officers are assigned very specific tasks, taking them out of active patrol. On average, the agency has about fifteen active patrol officers working cases.
Despite the close proximity, partnerships, and specialized task forces, the agency has yet to receive any funding specific to their genetic forensic testing. As Fenton describes, he has made requests for additional funds to improve his department but he is unable to get through his primary barrier, the Chief of Police. As Fenton notes, “The Chief is a great guy, he supports me and the officers, but he is old school, he does not see the benefit in DNA.” Like most forensic technicians and even officers interviewed, the influence of the command staff is very noticeable in determining if they collect and process genetic forensic evidence.

To better understand the complexity of the relationship between the Chief and Fenton, it is important to understand the context of the crime in the community. The crime in the area is primarily property crime as homicides are incredibly rare in the area as are sexual assaults. The primary call type is property crime scenes, which from 2009 to 2010 nearly quadrupled because of new home constructions that remained unfinished, vacant, and in many suburbs, complete construction materials and tools remained available for would-be thieves. Additionally, it is important to describe the climate of the area, it is hot, windy, and can often be very humid. According to Fenton, “there is a belief that if there is a visible print, you can pull it, but you know more often than not, I am rarely able to pull a print because of the climate.” Over the last year, Fenton has had success in collecting genetic forensic evidence, but despite the success, the Chief is still reluctant to allow Fenton to send out genetic evidence for processing, despite his successes.

One such success story involved a series of break-ins at a new construction site, seven burglaries in total with the same method of operation. The on-scene officer noted that commercial tools had smudges on them and called Fenton out to process the scene. When he arrived at the scene, he attempted to pull the print for processing, but because of the placement
on the tool, it was impossible to pull a viable print so instead Fenton made the decision to swab it for tactile DNA. According to Fenton, he figured, “*what the hell, take a chance.*” When he went back into his office, he completed the paperwork, submitted it for analysis, and several months later he received word that a match was found in CODIS. I had asked him how the Chief felt about the decision, “*Well he did not say much, and I did not think he would because here we had seven burglaries and no leads. However, once we got the hit from the system (CODIS), he told me good work and I provided the information to the detectives.*”

Despite demonstrating success with collecting and processing genetic evidence recovered at property crime scenes, the Chief was still reluctant to expand the processing. The influence of the Chief and the unwritten policy of the agency for handling evidence, almost nearly ensured that Fenton would collect fingerprints when able and unless absolutely necessary, would limit his collection of genetic forensic evidence. As Fenton explained had he been able to pull a fingerprint off the tool, he knows he would not have attempted the DNA swab. The following excerpt denotes the frustration Fenton experiences.

> “*We do not pay for evidence processing, I can send off as much as I want to the lab, we pay for my kits but evidence costs us nothing and yet the Chief still is resistant to allowing me to submit evidence for processing.*”

At a thematic level, this was incredibly interesting but more importantly at a practical level, I wanted to know exactly what could be influencing the resistance to processing. While there is clear influence from the command staff, I wanted to know what influenced the command staff. It was incredibly rare to hear from any interview that their cost of processing was already covered by the state and therefore I used this opportunity to uncover more. Fenton provides some additional insight into this issue as expressed in the following excerpt.
“I can send evidence to one of the four major crime labs. We no longer are charged but the Chief is apprehensive to send a lot to them for fear we will lose the access. The state got funding, so no one pays, but when I talk to the techs at the lab, they always tell you about the agencies that overused the service because they had money.”

In this regard, Fenton had highlighted a common theme in that perceptions matter and the fear of losing access to the service be it through overuse, reduction in funding, or simply being charged for the actual service, influences the decision to both collect and process evidence. To highlight the level of frustration at the lab, Fenton provided the following example.

“One of the lab technicians that I have worked with on a few cases, told me how agencies [large agencies primarily] would inundate them with requests simply because they had the money. In some cases, they did not even need evidence [processed]. He tells me, about this case where the person is on camera, identified by several witnesses, and the agency still sent in DNA to be processed.”

At this level, there is clear indication that the command staff may be partially influenced by the fear of losing access to services if they are perceived to be overusing the service. Moreover, there exists a dualistic dilemma wherein the expectation at the prosecutorial level is for full processing and the agency, which seeks to minimize the use of the process unless vital to the case. The following excerpt from Fenton notes these additional influences.

“*The county attorney has a large say in what I do at a scene, let me qualify that, the county attorney often wants me to return to a scene to process it for additional evidence, when sometimes there was no DNA at the scene to begin with.*”

Despite my additional questions attempting to elicit the influence of the prosecutor, Fenton provided nearly identical statements. It was clear that while the prosecutor influenced the decision to collect, it was in so much as the decision to obtain more evidence, not necessarily the decision to collect evidence. In this regard, the prosecutor became a positive influence to expand evidence collection and processing of forensic evidence and the agency reflected as a desistance mechanism to reduce collection of genetic forensic evidence. However, this reflected in the
treatment of forensic evidence by the Prosecutor. As the interview continued, I had inquired if there were any additional factors and it is here that an additional factor emerged, the victim.

Victim influence on the decision to collect genetic forensic evidence was not a new theme within the research. However, Fenton would describe the influence and the unintended consequence of the practice. The following excerpt summarizes the influence and the potential consequence well.

“When you are called to a scene, victims want DNA processed. They want me or the officer to tell them or better yet explain to them why it is not there if I leave with no swabs. I had this case, attempted criminal damage case, some kids set nails under tires at three houses, we had a dust storm, so hand prints are all over, I take some swabs, try to pull prints, nothing really usable, have this homeowner come over and notes there is a condom that he says is not his in his front yard, wants it collected, so I go over and collect it. I know it’s not going to be of any use, but you take it for a little PR [public relations].”

As we discussed this influence, I had been reminded of the literature on evidence room backlogs and I had asked Fenton about his evidence room. It appeared to me that simulated evidence collection could in fact be a source of some of the high backlogs discovered. Fenton provided some additional insight in that it was certainly feasible to have large backlogs of evidence because he has been known to collect evidence when it was not needed to simply appease a victim, according to Fenton, this directly related to the “Small town atmosphere” of the agency.

Throughout the interview, Fenton had offered many unique points, but what intrigued me most was his enthusiasm to expand or more importantly, to convince the Chief that expanded use of genetic forensic evidence is warranted and beneficial to the agency. In closing the interview, I had asked what about the practice influenced this perception of the benefits. It is here that Fenton offered what was entirely unique across any of the interviews, he was familiar with the national
study and had recently completed the free, online training that was made available at DNA.gov. Prior to the training he was not convinced that it was going to be beneficial, in closing Fenton offered the following, which summarizes well how influential training can be to disseminate benefits, “In this job, you have to stay current and for professional development, I had found the Free Training on DNA in Property Crime Scenes. After I had went through it, I could see where I was potentially missing evidence and after the last module, I knew that expanding my collection was going to help us, I believe it works.”

Fred – Director of Forensic Training Center

Fred has sixteen years of crime scene investigation experience and several additional years within law enforcement investigations. His selection as a forensic expert reflected his current role as the Director of a training facility for forensics. Fred provides training, education, and collection assistance to state and local agencies and specializes in homicides and sexual assaults and evidence detection. Frank describes his career as “I’ve kinda done it all.”

“I started in the military, like a lot of the officers, and worked a lot of different cases, nothing with evidence at first, but we had the opportunity for training, I then got out and started working with the state [crime] lab, I started with a specialized forensics taskforce on officer involved shootings, then got into computer forensic, homicide and rape taskforces. As time went on, I really had done it all in forensics and decided that I wanted to see an improvement in forensic training, which brought me to the training facility……. Things have moved so fast, now it is not just about collecting or lab work, we now include training on how to present forensics in the court.”

In his capacity as the director and his prior experience within law enforcement and evidence collection, Fred possesses amazing insight into the overall factors that influence decision making and as the interview proceeded, Fred wasted no time highlighting the current reality and challenges.

“The challenge here for us is not expanding but the priority. Prioritization is an issue, property crime is low. Violent crime continues to receive the highest priority, but it all gets done. You just end up waiting months {ME: How long on average?} It depends on
how many items, the prosecutor for the case, the viability of the evidence, or even what we rarely talk about is the pressure on the directors [ME: In what way?] They get pressured on rape kits to get them tested quick and then you have a DA who may be calling daily or even hourly to get updates ...... On average you can expect a few months or longer ... with property crime cases you are waiting the longest.” {Fred returned to his point on the lab later in the interview, it was moved to here to further express the frustration at the lab level} “Labs are still inundated with older samples to get processed and into CODIS; prioritization comes from all levels, current cases, backlogged cases, offender samples, and now arrestee samples.”

As the conversation continued, Fred had taken time to explain how training is first-and-foremost and issue within decision-making.

“New detectives want to collect everything, so they collect everything at the scene, the obvious is easy but you never know what may contain evidence so they collect everything that is relevant; out of the ordinary, items moved, things open, cigarette butts all over or they may even take a random sample of them, when it gets to the lab, they are going to test those in the best condition, those that logically hold the best useable evidence, the condition of the item. When we are dealing with an item alleged to be contaminated it may have evidentiary value—connect the suspect to the crime scene --- not for the court-- - but for the investigation.”

Specific to this excerpt, Fred had spent time discussing how new detectives and patrol officers who have received training on forensics become those most likely to collect or request processing of a crime scene for forensic evidence. Moreover, Fred had noted that there seems to be a decrease in utilization as officers become more aware of “how investigations work”, which is to say that overtime officers must balance their time-on-task against the benefits of collecting or requesting for scene processing. At first, they receive considerable evidence from these officers and as Fred explains, “Everything tends to be sent in and we have to sift through it.”

As we continued discussing the lab and the pressures, Fred expressed how influential the district attorney can be in the process or rather how the disconnect between the lab, the officer, and the prosecutor can become so vast.
“One issue is the field people [local officers, detectives] want in to work or are beginning to work a case and then the CSI techs [from the state] come in and often need to take it over if the DA requests. He may want new techs to reduce any legal challenges (high profile cases).”

As the conversation continued, Fred had explained how there was a clear influence between the prosecutor and the lab, which he expressed with a great deal of specificity in that the evidence technician becomes overworked and the burden placed on the lab great.

“You hear all the time now, about how there is no money, but funding is always an issue, we can adapt to the new work flow, but there needs to be better resources for court testimony, you are seeing more negative lab testimony, which is double the workload, called to testify on evidence and called to testify why evidence was not there, this happens all the time and you still have no real willingness to hire more [evidence technicians].”

Fred had offered major themes, which supported what other forensic experts and officers had noted, but most important from this interview were the suggestions offered on how to improve genetic forensic evidence collection within property crime scenes. According to Fred, what is limiting expansion is not necessarily funding, it is always an issue he offered, the complication is better education, or more succinctly, education that reaches all levels of the organization to inform them of the benefits, and then better training, certification, and a unified policy on the treatment of forensic evidence within these cases. As Fred explained, “Currently everyone goes about it their own way; we need a unified system, if anything to reduce challenges by the defense.”

Thematic Expression

The Forensic Evidence Technicians (ET) proved an invaluable and incredibly insightful addition to the research. They represented both sworn and non-sworn personnel, held a range of a few years to decades of experience, and possessed graduate, terminal, and professional degrees. Often the role of the ET is examined within the context of simply collecting evidence, which
initiates via officer request, prosecutor request, or formal policy. However, as expressed within the interviews, the ET is influenced across several factors in deciding if to collect evidence, which is not limited to an officer’s decision to call for scene processing.

The unique themes expressed within the interviews highlight the overburdened crime technicians, victim influence, ineffective forensic process, image of technician, and command staff. While some of these are expressed as unique themes across the other interviews, their potential to influence evidence collection is firmly present as an organizing theme.

A consistent theme within all of the interviews is the reality that the workload on an ET is considerable. The multiple roles they are responsible for within the criminal justice process is astonishing. Their involvement does not end with collection. All of the participants discussed their frustration or that of the frustration of other ET’s or lab technicians who becomes responsible for evidence collection, evidence transportation, processing, training, and court testifying. While none of the participants had carried out all of these roles, they all discussed how these multiple roles, coupled with the limited availability of ET’s, made the positions incredibly stressful. This was compounded by the recognition that the other stakeholders were not familiar with the “multiple hats” the ET’s wear. Prosecutors would expect collection, or inundate a lab with processing when evidence is present, but would also call out an ET to conduct negative evidence testimony when no suitable evidence was discovered, which was equally time consuming because this would require the ET documenting the scene and how they arrived at the conclusion that no viable evidence was discovered.

With numerous roles and responsibilities, an additional unique theme expressed, related to ineffective forensic processing policy, wherein collection (packaging, paperwork) and submission of marijuana for testing created both a backlog in the forensic labs for processing but
also would occupy the time of the ET preventing them from spending resources on additional tasks. What became important is that the recent expansion of Synthetic Cannabinoids has resulted in policy requiring submission of the evidence for forensic processing (influenced by the prosecutor) because officer field kits were not capable of identifying them, which requires precious resources dedicated to determining that the evidence is in fact a synthetic narcotic.

Despite being an unique organizing theme within the police officer interviews, the expression of victims as an influence is still important to highlight here as a unique theme. The reality is that both sworn and non-sworn ET’s become influenced by victims to collect evidence at their scene, which can result in “simulated evidence collection”, wherein the decision to swab, powder, or collect nonviable samples to demonstrate that the victim received the full resources of the agency. In some cases, evidence could be collected with no intent of formally processing the evidence. Important here is the recognition that victims are capable of influencing the officer to call out an ET for scene processing (or policy may dictate they are called), and the victim then is able to influence the ET to collect evidence, even if no viable sample is present.

Problematic is the unique organizing theme reflecting the image of the technician. Either expressed as emotion within the cases worked, or expressed as “winning” over officers by solving a case, it became apparent that influencing the ET is the pragmatic reality that is their emersion within the investigative process as “crime fighters”, “crime solvers”, or “officers in lab coats.” This becomes important because forensics is meant to epitomize democratic policing, wherein forensics is disconnected, a neutral, objective scientific tool and the technicians reflected in these qualities. This presents as both a unique theme and as a policy issue in that the expansion of forensic processing and further alignment of forensics within agencies may prove problematic for issues of accountability, oversight, and potential for misconduct.
The last unique theme expressed is that of the command staff, which certainly appears to be a common theme within decision-making, but becomes unique within the context of evidence submission and budgets. As expressed within the interviews, there appears to be an influence wherein command staff is inhibited by the belief that if they submit evidence from lower prioritized crime scenes, they may lose access to the reduced costs for processing or receive reduced priority within their evidence submissions for being deemed to “overuse” the service. This was echoed across several interviews and becomes unique in that some agencies do not pay for processing and yet were not collecting forensic evidence, even when present because of the perception of worth and the reality that the labs are overburdened. The assumption would be that if an agency does not pay for processing they would use the service in assist them, but the reality is that as expressed here, it is likely that even when the costs are accounting for, collection may not occur.

Table 10 – Forensic Expert Thematic Expression

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<th>Organizing Theme(s)</th>
<th>Organizing Concepts</th>
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<td>Internal And External Pressures on Prioritization</td>
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<td>Relationship With Lab Testing Technicians</td>
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*Prosecutor Interviews*

Three prosecutors were interviewed reflecting large urban and a medium suburban agency. Each prosecutor possessed considerable years of service and familiarity with genetic forensic evidence. The following table provides the participants information.

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<th>Table 11 – Prosecutor Participant Overview</th>
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<tr>
<td>Participant Name</td>
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<tr>
<td>Patricia</td>
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<td>Patty</td>
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<td>Parker</td>
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*Patricia – Former Prosecutor*

Patricia presented an interesting interview participant; she was for the past twenty years a prosecutor in a very large, urban city. This was until one year ago when she decided that she would transition into defense work, much to the criticism of some of her colleagues. She was knowledgeable, skilled, and highly adept at presenting forensic evidence within the courtroom.
and working with laboratories and agencies in trying cases. Patricia valued the investigative benefit and prosecutorial strength that genetic forensic evidence provided. With one opening question, a few follow-up questions, and the occasional statements, Patricia led me through her influence on the investigative decision-process in what was nearly an hour and a half. The insight she offered and the influence of her department on the investigative process mirrored much of the other prosecutors. Her unique transition into defense work provided meaningful points of reflection on just how the criminal justice process would have to adapt if to account for expanded processing of this evidence type.

I began with the primary guiding question on how influential was her department on the processing of forensic evidence. Patricia, quickly and without hesitation offered, “Very.” As Patricia went on to describe, her decision to charge a case reflected the severity of the offense, the weight of the evidence, and the resources at her disposal. Concerning DNA evidence, Patricia made a very interesting analysis in that, “what we [prosecutors] ask ourselves is if the DNA is worth it, it is a fantastic tool but it takes months and months to get processed and even then what you may send out may not come back completely processed.” This was a similar point of contention that Patty noted, in that there was conflict between the office and the forensic laboratory. There was disconnects between what the prosecutor believed needed to be processed and what the laboratory technician deemed viable. This disconnect also extended into the officers’ decision to collect evidence. In reality, there was clear prioritization of cases and evidence and if there were little evidence within a burglary, the prosecutor would be unlikely to pursue the case. Likewise, if there was evidence linking the person to the scene (i.e., eyewitness, caught with the stolen property, or etc.) and there was genetic evidence at the scene, the officer
would be more likely to collect the evidence to ensure that the prosecutor would not return the case file for additional preparation. Consider the following points expressed by Patricia.

“There is a sense of superiority within the office, we have the final decision.” “Officers most certainly would be influenced because they [officers] are preparing cases for us and therefore our priorities and expectations influence how they prepare the file.”

Additionally, as Patricia highlighted, often you may have a case where evidence is not processed but where the strength of the evidence was so overwhelming, there was no need to spend the resources to have it processed. However, when the grand jury convened, there was almost a “group think belief where DNA is absolute.” According to Patricia, to not present forensic evidence to the grand jury or even to a trial jury was to open up a line of questioning by the defense as to why it was not processed. This is known as “negative evidence testimony”, wherein the prosecutor would need to put an expert on the stand to present “why DNA evidence was not found at the scene or would not be at the scene.”

Lastly, Patricia offered that like any investigative tool at the disposal of an agency, resources are always going to be important. The decision to collect genetic forensic evidence at a crime scene would be influenced by the office. However, what most has to change to accommodate the increased use is putting money into the prosecutor’s office. This line of discussion was prompted by my question, “If the office was capable of handling an increased collection and processing of DNA by law enforcement.” Patricia offered that while the agency has the ability to influence an officer’s decision, a change in the agencies practices would require the office to adapt. With stronger evidence linking a person to an incident, Patricia noted that the officer would certainly see “more plea bargains” and “more cases.” It is here that Patricia offered the most interesting insight; she noted that the expansion of forensic evidence analysis within property crimes scenes would be a catalyst for change within the office. The agency
already was familiar with using diversionary programs, but for cases of felony burglary, the only penalty was incarceration. With increased collection and processing by the police, the leadership within the prosecutor’s office would have to “acknowledge and implement restorative and rehabilitate alternative programs.”

In summarizing my interview with Patricia, I was reminded how connected each of the institutions are within our system. A change in police practice will influence the courts, and that of corrections. In this interview, it was clear that Patricia had direct and indirect influence over an officer’s decision to collect and process DNA. However, if the police agency made dramatic changes in their collection and processing of forensic evidence there would most certainly be challenges for the office to overcome. This was echoed in the last point offered by Patricia,

“The more tools, the more effective, the better at it and the quicker we get at using this evidence type, the more we are able to obtain justice. The office will just have to adapt and how we adapt will matter for the community.”

Patty – Prosecutor

Patty epitomized the perception of a prosecutor. She was direct, inquisitive (always asking for additional clarification or additional research to support a line of questions), and possessed twenty-one years of prosecutorial experience working within a large, urban, and by her accounts a “highly focused” office. The office has been highly cited for its streamlined approach to felony prosecutions, resulting from the creation of a specialized unit that evaluates felony violent and property crime scene cases. It is here that the office becomes as noted by Patty, “very influential in the forensic process.”

As Patty explains, when the unit evaluates cases brought to them by the officer, they will evaluate the evidence and “if the case does not have enough evidence or DNA was not collected, they [evaluating prosecutor] may send it back for more evidence.” The felony review stage and
subsequent approval of the case for trial by the Assistant District Attorney has created a system where the prosecutor has the utmost of say over if an officer collects evidence. By the account of Patty, “They [Police] want charges; we [Prosecutor] want to win.” For the police to get their charges in felony cases, they will, as noted by Patty, “Do as we request.” If the police do not, the case does not move any further. Furthermore, because of the highly streamlined approach, DNA became used only when it is advantageous to the prosecutor’s office. As Patty depicted, “if there is overwhelming evidence, we do not need to test the forensics.” I had asked Patty if this limited the use of CODIS and linking of unsolved cases to suspects, her perspective was that “current resources allow for us to focus on the cases we have, not the cases that are potentially out there.”

Unlike the other prosecutors, Patty had direct involvement within the collection and processing of forensic evidence. Patty does send evidence directly to the lab to be processed. It is at this point, that it became very clear that there was considerable contention and even resentment reflecting the conflict between the prosecutor and the forensic lab. The following excerpt from the interview clearly depicts this conflict.

“I may want 50 items tested, just had 100 valid requests in a case where a kid killed his father, the crime lab wants to tell me we do not need to test this, or this is not important [the lab technician]. They [lab technical] will selectively decide what is important and not important to test. I had recently sent in 42 items of evidence and they had the audacity to send me back, eight. I do not tell them how to process evidence, but here they are in essence trying to tell me how to argue a case, they believe they can tell me what is important and not.”

While there is clear conflict between the prosecutor and the laboratory, Patty acknowledges there are issues that force prioritization within the lab. As Patty notes, “The crime lab is overburdened and more DNA is being required, there are mandates to increase processing, but no additional funding.”
The point of being overburdened is a clear reality across all levels. There exists legislative policy that has mandated that facilities process certain evidence within a particular time. However, often neglected is the reality that a quick turn around on processing does not mean the case makes it to trial faster. Consider the following example offered by Patty, “Right now, sex assault kits are required to be processed in 30 days. Rape charges may take a year to charge and then often we are dealing with consent not identification.” There is internal and external pressure on labs to processes the kits that other evidence types becomes secondary.

“Properly crime scenes are a low priority, and the burden on the lab simply creates additional problems, I even had a homicide last year that took a year and a half to get all [the evidence] tested.”

To return to the influence on the officer to collect evidence, Patty highlights the reality that juries expect for the evidence to be presented.

“We now put on negative evidence testimony, putting on a fingerprint expert or forensic expert to explain why forensic was not available – to counter the expectation that it is always there, we have to demystify forensics to overcome their burden of doubt.”

In this line of discussion, it became clear how frustrated she has become with the expectation that society has placed on forensics. She offered a very humorous closing argument that she delivered, explaining to the jury how “It (DNA) is not like Pig Pen from Charlie Brown.”

Like Patricia, Patty expressed the reality that with an increasing use of DNA (if only collection), there would be a transition within the office. As she expressed “More evidence can only help us, it provides good evidentiary value, but it may force us to adapt our approach to adjudication.” However, Patty was quick to follow-up that because of the “fiscal and backlog reality, it is not feasible to collect all evidence, even if there is [genetic] forensic evidence at a scene.” If the police agency is able to improve their collection of genetic forensic evidence, Patty firmly believes that we will see clearly more plea bargains. Patty offers this basic statement.
on the expansion, “More evidence, more pleas – less evidence, more likely to go to trial.” It is important to frame this statement by noting that the conversation had transitioned into a dialog concerning felony cases with evidence linking the person to the scene.

Lastly, Patty provided an example in the inherent dangers in the overuse of genetic forensic evidence. Patty provided me the following case to illustrate her point.

“I recently worked a case involving a young mother murdered, brutally, shot four times, and her throat slit. Swabs worked up another male profile [DNA]. We knew about the guy as she has recently gone out on a date that Saturday, she died on Monday. As the man explained he did know her and he did have sex with her on the night of their date. They had had anal sex on their first date and she ended up dead on Monday. At the jury trial, I had to explain why his DNA was there and how this was not a rape murder, but a murder only committed by another man.”

As I listened to Patty offer this example, I was reminded of the other perspectives across the stakeholder continuum that genetic evidence is but a linking item to establish a connection to a scene. Here Patty had a case where the defense had offered that there was DNA of another man found inside the victim and that there was clear indication of trauma and she was brutally murdered. The clear weight of genetic evidence and the perception of the jury have, as noted by Patty, “significantly influenced how we try cases.”

In summarizing my interview with Patty, she clearly details her influence on the decision of officers to collect evidence at a scene, reflected in her expectations and evidentiary threshold for pursuing a case. However, her expectations are influenced by her interaction and thus working relationship with the laboratory and the technicians working the cases. With such a streamlined approach to evidence collection, Patty becomes the gatekeeper to the processing of forensic genetic evidence across all felony cases. Therefore, it can be expressed from this interview that the experience, familiarity, and perception of the evaluating prosecutors influences the officer’s decision to collect evidence.
Parker – Prosecutor

Parker was an enthusiastic and eager participant wanting to share with me her experience, knowledge, and outlook from the initial conversation we had. She possessed nearly ten years of experience, representing a medium suburban area within what she would consider a “small agency, with little money.” Parker has considerable knowledge presenting genetic forensic evidence within the courtroom but expressed that concerning property crime scenes, “We were lucky to see fingerprints taken, property crime is simply so low we rarely see it presented.” However, as Parker walked me through her experience and the associated challenges and opportunities that have emerged, she shared an important insight that all three prosecutors have come to share during the interviews, that of the view of the jury, which is detailed by the following excerpt.

“The jury is media driven, they think we can do everything, duplicate what is done on CSI, in the courtroom, but it falls flat.

The impact of the CSI effect on the courtroom is well-documented as discussed within the literature review. However, the CSI effect did little to change how evidence was collected. The influence of the prosecutor on officer decision making as expressed by Parker was present but not overly influential because the goal was to win, as the following excerpt expresses.

“Being honest, I have little influence on the officers decision-making, but that does not mean there is no influence in general, it depends on the level of the prosecutor, new prosecutors get what they get, so they need to work with officers to win their cases. Because of the time it would take to get DNA tested, we would ask, do we need it to win? If it is too costly, or will take too long, we may not take it to trial.”

The practical reality of a prosecutors experience has an influence on officer decision-making. Parker was relatively new within the office, so her ability to request additional forensic
collection or processing was dependent on what she considered, “Being nice” or fostering a good working relationship with the lab. As the interview continued, Parker began to discuss how the backlog is a barrier but prosecutors have been working around it for years.

“The backlog is the main issue, it is problematic, we have to wait, and wait, and wait months and months, a few times a year. It slows us up so we go into court a year later. Lots of time, we get the case, it just got submitted and then it gets to the lab, so we have to wait for it to process, luckily as a prosecutor I have some pull to get the DNA pulled and get it out of the hopper so I could get it tested because I needed it. To work up a case to see it settled. So they [forensic technician at the lab] wait until you call, the DNA could stay in the hopper and it could take 3-6 months. I call the lab, tell the technician that I am about to present a case, and more often they pull it out and get it tested over the next few days. The working relationship is key, you need them as a friend, on your side, because they are so vital, they hold your ability to go to court.

As Parker denotes here, the backlog is always an issue, it has been for years, but through fostering a good working relationship with the lab and lab technicians, the backlog may possibly be sidestepped to see evidence processed when the prosecutor is ready to go to court.

As the interview continued, I had inquired about any recent challenges that she has experienced and immediately Parker expressed issues involving negative evidence testimony. According to Parker, “Negative evidence testimony will likely increase, because the defense attorney will mention why it [forensic evidence] was not collected, so you have to rebut it, because we tried and there wasn’t.” With a jury expecting to see evidence collected, when it is not, it is only natural for the defense to present a challenge to the case. As Parker jokingly stated, “you cannot blame them, I’d do the same…..Defense attorneys are aware of our backlog and continually try to poke holes in the cases why was it [forensic evidence] collected and not processed.” In this regard, it can be expanded to include the issues within simulated evidence collection, which only open up more criticism.
Lastly, I had inquired about the future of forensics, specific to how a routine genetic forensic treatment towards property crime scenes would influence her office. Parker very eloquently and almost immediately stated the following, “The burden is not on the court, because you have the plea, it takes minutes, the trial can take a day or even days. No reason to take the case to trial, just settle left and right, there is no reason for a diversionary program, just plea it out.” Unlike the prior prosecutors who expressed potential issues or an opportunity to force a change within the office, Parker clearly saw no need for the court to change, rather routine forensic processing only makes more efficient the use of pleas. Routine treatment as Parker expressed epitomizes the court system; it would make it significantly easier to close cases.

Thematic Expression

Until recently, the involvement or subsequent influence of the prosecutor and that of their office was anecdotal concerning forensic evidence collection. As expressed within the three interviews, the influence of the prosecutor within collection can be said to be moderately influential. The unique organizing themes emerging within the IPA interviews include jury perception and CSI effect, crime prioritization, and career success.

As expressed by each of the prosecutors within the interviews, juries have come to expect forensics within the courtroom. This expectation has fostered a need to either have available expert witnesses to testify on recovered evidence or calling forth a forensic technician or officer to explain why no suitable evidence was recoverable. The CSI effect has permeated all aspects of the criminal justice system, most specifically the agency, officers, and the courtroom.

The influence of the prosecutor can be said to be moderately influential as the familiarity that the prosecutor has with genetic evidence and the associated costs of processing does
influence how they evaluate cases, as noted by both Patricia and Patty. However, the ability for the prosecutor to stipulate that genetic forensic evidence be collected within property crime scenes is minimal. As discussed by each prosecutor, they have little influence beyond calling for additional processing, or ensuring that evidence was attempted to be collected, when they evaluate a case file. They do so based on the propensity or likelihood that the defense may challenge that evidence was not recovered, playing to the CSI mentality, or if such evidence can ensure a conviction. As Parker noted, if the prosecutor does not prepare an expert witness list including forensic experts, it is likely that the defense could simply raise the question within the court.

Expanding on the influence that the prosecutor has on officer decision making, the prioritization of cases cause prosecutors to devalue property crime scene cases except those deemed high profile or those where the use of forensic evidence may link a suspect to several scenes increasing the notoriety. In this regard, the influence of the prosecutor can facilitate in both collection and processing. As expressed within the interviews, the influence of the prosecutor at the collection level is minimal, but the influence of the prosecutor in what is processed can be significant. As noted by Patty, she controls what is processed or more succinctly, she submits for analysis forensic evidence. The influence of those prosecutor officers that control processing, can certainly display considerable influence on the part of an agency. If a prosecutor does not value property crime scene cases and will not authorize processing within those cases, unless there is a specific threshold, it is certainly feasible that it can inhibit collection at the agency level as Patty denotes.

Career success was a final unique organizing theme. While a reader is likely to claim that career success is a general theme in all work environments, it is every important within the work
of the prosecutor and their influence on officer decision making. Each interview participant noted very specifically that their goal is to “win.” Each selected for prosecution cases based on their ability to win those cases. As genetic forensic evidence becomes more routinely analyzed (collected and processed), prosecutors will witness more efficient prosecutions, more effective outcomes, as the average sentence noted in the Denver study witnessed a 10-fold increase in the average sentence for a residential burglar (Ashikhmin, Berdine, Morrissey, & LaBerge, ND), and as an outcome will likely come to influence agencies to become better trained in forensic evidence collection. At the prosecutor level, DNA evidence in property crime scene cases may be prioritized lower on based on the crime type, but having nearly guaranteed conviction rates when forensic evidence is present and selected for prosecution, longer sentences, and in many cases, linking the suspect to multiple crime scenes is a tremendous motivation to influence officers.

Table 12 – Prosecutor Thematic Expression

<table>
<thead>
<tr>
<th>Global Theme</th>
<th>Organizing Theme(s)</th>
<th>Organizing Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Factors</td>
<td>Jury Perception</td>
<td>Negative Evidence Testimony</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CSI Effect</td>
</tr>
<tr>
<td></td>
<td>Crime Labs</td>
<td>Overburdened Crime Labs , Turn-Around Time on Evidence, Disconnect Between the Office and the Lab</td>
</tr>
<tr>
<td></td>
<td>Forensic Funding for Evidence Testing</td>
<td>Funds for Backlog Testing, Limited Funds for Evidence Testing, Synthetic Cannabinoids</td>
</tr>
<tr>
<td></td>
<td>Daubert Standard</td>
<td>Evidence Technicians, Collection, Testing, Testifying</td>
</tr>
<tr>
<td></td>
<td>Police Agency Policy</td>
<td>Formal Policy, Officer Discretion</td>
</tr>
<tr>
<td></td>
<td>State Policy</td>
<td>Mandate to Increase Processing</td>
</tr>
<tr>
<td></td>
<td>CSI Effect</td>
<td>Weight of Genetic Evidence</td>
</tr>
<tr>
<td>Organizational Factors</td>
<td>Crime Prioritization</td>
<td>Personal vs. Property</td>
</tr>
<tr>
<td></td>
<td>Felony Review Stage</td>
<td>Specialized Evaluation Teams to Evaluate Cases for Prosecution</td>
</tr>
<tr>
<td></td>
<td>Budget</td>
<td>Evidence Testing, Expert Testimony, Prioritization of Cases</td>
</tr>
<tr>
<td></td>
<td>Case Loads</td>
<td>Plea Bargains, Diversionary Programs</td>
</tr>
<tr>
<td>Personal Factors</td>
<td>Reputation</td>
<td>Winnable Cases, Cases of Value (Community and Individual Perception)</td>
</tr>
</tbody>
</table>
Perception of Property Crimes | Value in Testing Evidence
---|---
Career Success | Take Cases Based On Those With The Most Return, Focus On The Now Not The Later
Experience | Value of Forensics, Necessity of Forensics, Familiarity with Success of Property Crime Scene Evidence

**Section Two: National Survey Results**

This section provides the results of the national survey of law enforcement officers across the United States. Presentation of the results are provided in descriptive format to provide an unfiltered portrayal of the factors that influence officer decision making in concert with agency policy and contextual points within the treatment of genetic forensic evidence within property crime scenes.

*Survey Response Rates*

Removing attrition from invalid email addresses and deployed officers, the final sample reflected 2893 potential respondents, of those potential respondents 460 surveys were completed, and removing surveys with >75% missing values, resulted in a completed sample of 441. The response rate for this survey was 15% with an error level of 4.3% at the 95% confidence interval. The survey took approximately 20-minutes to complete as indicated within the Remark system, when controlling for obvious outliers (one respondent is indicated as having taken 2680 – 2700 minutes to complete the survey). Table 13 provides an analysis into the response rates across each participant notification wave that occurred.

**Table 13 – Survey Response Rates**

<table>
<thead>
<tr>
<th>Participation Requests</th>
<th>N</th>
<th>Response Rate</th>
<th>%Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Participation Request</td>
<td>250</td>
<td>.086</td>
<td></td>
</tr>
<tr>
<td>First Reminder</td>
<td>364</td>
<td>.125</td>
<td>+3.9%</td>
</tr>
<tr>
<td>Second Reminder</td>
<td>460</td>
<td>.159</td>
<td>+3.4%</td>
</tr>
</tbody>
</table>
As Table 13 indicates, each subsequent participation request improved the response rate on average 3.6-percent, which while not a large improvement, did provide moderate gains within the sample improving the overall sample by nearly half (an increase of 210 participants into the research). During the subsequent analysis of the survey results, a standard non-response analysis was conducted, marking all those respondents who failed to complete more than 75-percent of the survey (reflecting missing information within the agency or officer sections of the survey). Individual analysis of those specific records resulted in the removal of the respondent data when pertinent responses were not answered. Subsequently, the sample was reduced by 19 respondents, which resulted in a final sample of 441, reflecting a 15% response rate.

Of the 441 officers who responded to the survey, 87.3-percent (n=384) were male and the average age was 44 with a minimum age of 25 and a maximum age of 66. The majority of respondents were predominately white and non-Hispanic or Latino, reflecting at 86.4-percent (n=381) and 89.3-percent (n=394). Representation of other races were significantly lower reflecting at 2.9-percent (n=13) for both black and American Indian officers. Asian and Native Hawaiian or Pacific Islander officers represented five officers comprised under 2-percent of the total sample. 5.7-percent (n=25) of officers declined to provide the racial demographic characteristics.

Concerning education levels, 43.4-percent (n=190) of officers held a Bachelor’s Degree, though it should be noted that 17.4-percent (n=76) of officers possessed some college experience but did not possess a graduate degree. Just over 18-percent (n=80) of the officers possessed a graduate degree. The range of education levels is as expected. The complete frequencies and percentages for the respondent data are displayed in Table 14.
<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
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<tr>
<td>Male</td>
<td>384</td>
<td>87.3</td>
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<tr>
<td>Female</td>
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<td>Total</td>
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<tr>
<td>Age</td>
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<tr>
<td>20-30</td>
<td>11</td>
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<td>31-40</td>
<td>127</td>
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<td>41-50</td>
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<td>51-60</td>
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<td>61-70</td>
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<td>Total</td>
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<td>Race *</td>
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<tr>
<td>White or Caucasian</td>
<td>381</td>
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<td>American Indian or Alaska Native</td>
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<tr>
<td>Black or African American</td>
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<tr>
<td>Asian</td>
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<td>1.1</td>
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<tr>
<td>Native Hawaiian or Pacific Islanders</td>
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<td>.7</td>
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<tr>
<td>Other</td>
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<td>1.8</td>
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<tr>
<td>Ethnicity</td>
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<td>Hispanic/Latino or Hispanic/Latina</td>
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<td>Yes</td>
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<tr>
<td>No</td>
<td>394</td>
<td>89.3</td>
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<td>I do not wish to provide this information</td>
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<td>5.7</td>
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<tr>
<td>Education Level</td>
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<td>Some School no diploma</td>
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<td>High school diploma or GED</td>
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<td>1.8</td>
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<td>Some college no degree</td>
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<td>17.4</td>
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<td>Vocational school graduate</td>
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<td>1.8</td>
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<td>Associate’s Degree</td>
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<td>Bachelor’s Degree</td>
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<td>Master’s Degree</td>
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<td>Professional Degree (JD)</td>
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<td>Total</td>
<td>438</td>
<td>100.0</td>
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</table>

*Respondents were able to indicate multiple responses for the racial demographic question and as such, the total reflects higher than the total sample of 441.
Concerning the agency variables, the majority of officers worked within municipal police departments at 66.4-percent (n=293). 26.1-percent (n=115) of officers were associated with a Sheriff’s Department, 5.9-percent (n=26) from a state agency, and 1.6-percent (n=7) worked within either a Tribal or Federal agency. The majority of the officers responding to the survey, 56.3-percent (n=247) worked within agencies with more than 100 officers. 19.6-percent (n=86) of officers worked within agencies with staffing levels between 50-99 officers, 14.6-percent (n=64) between 25-49 officers, and 9.6-percent (n=42) worked within agencies with below 25 officers.

Accounting for the margin of error (4.3%), on average the majority of the officers served communities reflecting middle to working class neighborhoods. 32.1-percent (n=140) of officers served middle-class neighborhoods predominately and 30.7-percent (n=134) stated serving working-class neighborhoods. The least represented within the survey are those serving predominately upper-class neighborhoods with only 3.7-percent (n=16) of officers serving this specific population. Nearly 10-percent of officers indicated that they work within what they would classify as poor neighborhoods. Additional analysis of the “other” answer category (n=42) revealed that officers worked across a variation of “working and poor” (n=2), ‘working and middle” (n=1), “Lower to Upper with a large gap” (n=1). The primary answer provided within the other category reflected “All Classes Equally Represented” at 62-percent of the total answers written in by respondents.

The racial demographics for the primary service populations were nearly equally divided with 43.7-percent (n=191) of officers servicing areas primarily Caucasian and 46.2-percent (n=202) servicing what they consider to be highly diverse. 8.2-percent (n=36) of officers indicated that they work within largely minority neighborhoods and only four officers indicating
they work within a largely immigrant community. A complete analysis of the agency descriptive information is displayed within Table 15.

**Table 15 – Frequencies and Percentages for Agency Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agency Type</strong></td>
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<td></td>
</tr>
<tr>
<td>Municipal Police</td>
<td>293</td>
<td>66.4</td>
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<tr>
<td>Sheriff’s Department</td>
<td>115</td>
<td>26.1</td>
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<tr>
<td>State Agency</td>
<td>26</td>
<td>5.9</td>
</tr>
<tr>
<td>Other (Tribal, Federal)</td>
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<td>1.6</td>
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<tr>
<td><strong>Total</strong></td>
<td>441</td>
<td>100</td>
</tr>
<tr>
<td><strong>Agency Size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;25 Officers</td>
<td>42</td>
<td>9.6</td>
</tr>
<tr>
<td>25-49 Officers</td>
<td>64</td>
<td>14.6</td>
</tr>
<tr>
<td>50-99 Officers</td>
<td>86</td>
<td>19.6</td>
</tr>
<tr>
<td>100+ Officers</td>
<td>247</td>
<td>56.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>439</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Community Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>16</td>
<td>3.7</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>61</td>
<td>14.0</td>
</tr>
<tr>
<td>Middle</td>
<td>140</td>
<td>32.1</td>
</tr>
<tr>
<td>Working</td>
<td>134</td>
<td>30.7</td>
</tr>
<tr>
<td>Poor</td>
<td>43</td>
<td>9.9</td>
</tr>
<tr>
<td>Other</td>
<td>42</td>
<td>9.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>436</td>
<td>100</td>
</tr>
<tr>
<td>Community Makeup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primarily Caucasian</td>
<td>191</td>
<td>43.7</td>
</tr>
<tr>
<td>Largely Immigrant</td>
<td>4</td>
<td>0.9</td>
</tr>
<tr>
<td>Largely Minority</td>
<td>36</td>
<td>8.2</td>
</tr>
<tr>
<td>Diverse</td>
<td>202</td>
<td>46.2</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>437</td>
<td>100</td>
</tr>
</tbody>
</table>

Vital to the decision to collect genetic forensic evidence is the associated experience officers possess and the quality of the training they have received. Concerning experience, 38.6-percent (n=157) of officers indicated that they possessed between 6-10 years of experience working with genetic forensic evidence. Slightly less officers reported experience levels between 1-5 year with 25.6-percent (n=104) indicating experience at this level. 15.5-percent (n=63) of
officers indicated that they had between 11-15 years of experience within this evidence type and further less with experience between 16-20 years, 5.7-percent (n=23), and 21-25 years of experience, 2.2-percent (n=9). Of importance to note is that 12.5-percent (n=51) of the officers surveyed possessed no experience working with genetic forensic evidence. The resulting average years of experience officers possessed working with this evidence type was 7.88 with a minimum of no experience and a maximum of 25. The standard deviation was 5.5.

The officers evaluation of the training they received specific to this evidence type indicated that 31.6-percent (n=139) of officers would rate their training as good, 23.4-percent (n=103) as fair, 20.9-percent (n=92) as very good, 11.1-percent (n=49) as poor, and 7.7-percent (n=34) as excellent. A summary of the survey question would indicate that the majority of officers positively evaluated their training, which as Patton commented on during the IPA interview, “it’s O.K.” Of importance to denote is that 5.2-percent (n=23) of the officers indicated that they received no such training. This is even more important when placed within the context of the fifty-one officers who possess no experience working with genetic forensic evidence.
Table 16 – Frequencies and Percentages for Officer Training and Genetic Forensic Evidence Collection Experience

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genetic Forensic Evidence Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Experience</td>
<td>51</td>
<td>12.5</td>
</tr>
<tr>
<td>1-5 Years of Experience</td>
<td>104</td>
<td>25.6</td>
</tr>
<tr>
<td>6-10 Years of Experience</td>
<td>157</td>
<td>38.6</td>
</tr>
<tr>
<td>11-15 Years of Experience</td>
<td>63</td>
<td>15.5</td>
</tr>
<tr>
<td>16-20 Years of Experience</td>
<td>23</td>
<td>5.7</td>
</tr>
<tr>
<td>21-25 Years of Experience</td>
<td>9</td>
<td>2.2</td>
</tr>
<tr>
<td>Total</td>
<td>407</td>
<td>100</td>
</tr>
<tr>
<td>Quality of Training Received</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>34</td>
<td>7.7</td>
</tr>
<tr>
<td>Very Good</td>
<td>92</td>
<td>20.9</td>
</tr>
<tr>
<td>Good</td>
<td>139</td>
<td>31.6</td>
</tr>
<tr>
<td>Fair</td>
<td>103</td>
<td>23.4</td>
</tr>
<tr>
<td>Poor</td>
<td>49</td>
<td>11.1</td>
</tr>
<tr>
<td>Did not receive training</td>
<td>23</td>
<td>5.2</td>
</tr>
<tr>
<td>Total</td>
<td>440</td>
<td>100</td>
</tr>
</tbody>
</table>

Geographic Profile and GeoMapping of the Survey Participants

The geographic profile of the sample indicates that there is a broad representation of officers from throughout the United States, including a participant representing the United States Department of the Interior BIA/OJS – Crow Agency, located in Montana. The states with the most participants include Florida (80), Illinois (44), and Ohio (32). The least represented states include North Dakota (1) and Hawaii (1). Two respondents did not indicate their state, resulting in a geographic profile of 439 respondents. In completing the geographic profile, it was unexpected to see both Texas and New York not represented in the survey as their law enforcement populations are considerable. Figure 3 provides the GeoMapping of the final sample reflected in the number of officers responding to the survey.
Figure 4 – GeoMapping of Research Participants
Survey Results Question Analysis

To provide a more direct analysis of the research findings, the following section contains the descriptive results of each survey question, presented as asked on the survey and sectioned across each primary field (Agency Information, Lab Information, and Officer Perspective). It is the intent of this approach to provide readers with the results of the national survey in the most easy to digest manner. The last section of this chapter contains the mixed-method analysis of the results with specific analysis into the associated factors that influence an officer’s decision to collect or call for collection of evidence within property crime scenes.

Agency Information

The majority of officers indicated that their agency had more than 5 years of experience routinely collecting genetic forensic evidence for all crime types. 45.9-percent (n=202) indicating that their agencies possessed over 10 years of such experience. 39.8-percent (n=175) possessed more than 5 years, but less than 10 years of experience with this evidence type on a routine basis. 11.1-percent (n=49) had 2 to 5 years of experience and analysis of genetic evidence, and 3.2-percent (n=14) had two or fewer years of experience with genetic evidence analysis at a routine level.

Specific to genetic forensic within property crime scenes, 29.3-percent (n=129) of officers indicated that genetic evidence is collected “a few times during the year.” Accounting for the margin of error (4.3%), nearly equal numbers of officers, 25.9-percent (n=114), indicated that genetic evidence was collected “more than once a week.” This demonstrates that in many cases, the treatment of such evidence within these crime scenes is not uniform nor does an informal treatment exist within this evidence type. It appears, as discovered within the IPA interviews that treatment of this evidence type is highly depending on numerous factors. No
standardized approach seems to exist across the United States. 18.8-percent (n=83) of officers noted that evidence is routinely collected “two to three times a month”, 12.7-percent (n=56) “about once a month”, 8.4-percent (n=37) at “about once a week”, and 5-percent (n=22) indicating that they do not routinely collect crime scene genetic forensic evidence. However, it can be said that collection is common in that 65.8-percent of officers indicated that property crime scene genetic evidence is collected once a month and nearly a quarter of officers indicating more than once a week.

While collection of this evidence type is important, it holds little investigative benefit unless it is processed for comparison. Concerning agencies that routinely collect and process genetic evidence within property crime scenes, there was again a nearly even split in the treatment of such evidence with 31.4-percent (n=139) indicating that it is “Seldom” analyzed and 31.4-percent (n=137) expressing that such genetic evidence is “Frequently” analyzed within property crime scenes. Identical rates were found at the extremes of evidence analysis with 18.3-percent (n=80) of officers responding that genetic evidence within property crimes scenes are “Almost Always” and “Hardly Ever” analyzed. Of importance here is that only 1.1-percent (n=5) of responses were missing for this item. There is a 50/50 split in if property crime scene genetic forensic evidence is processed. It is collected but it is not processed.

When asked to rate their satisfaction with the treatment of genetic forensic evidence within property crime scenes, 33.9-percent (n=149) indicated that they were “Somewhat Satisfied”, 33-percent (n=145) indicated that they were “Very Satisfied”, and 22.3-percent (n=98) were neutral in their evaluation. Few officers indicated that they were “Somewhat Dissatisfied” or “Very Dissatisfied” with 8.2-percent (n=36) and 2.7-percent (N=12) respectively.
When asked to evaluate the current policy treatment, officers indicated that primarily their agency is neither expanding nor reducing policy within this crime type at 62.9-percent (n=275). With that said, 32-percent (n=140) of officers indicated that their agency is expanding policy to see better genetic evidence treatment within property crimes scenes, and a very small percentage 5-percent (n=22) expressed that their agency is reducing genetic collection and processing for property crime scenes. Table 17 contains the complete frequencies and percentages for this subsection.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period of Routine Genetic Evidence Analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 2 years</td>
<td>14</td>
<td>3.2</td>
</tr>
<tr>
<td>2 to 5 years</td>
<td>49</td>
<td>11.1</td>
</tr>
<tr>
<td>More than 5 years, but less than 10 years</td>
<td>175</td>
<td>39.8</td>
</tr>
<tr>
<td>10 or more years</td>
<td>202</td>
<td>45.9</td>
</tr>
<tr>
<td>Total</td>
<td>440</td>
<td>100.0</td>
</tr>
<tr>
<td>Routine Property Crime Scene Collection – Last Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not At All</td>
<td>22</td>
<td>5.0</td>
</tr>
<tr>
<td>A Few Times during the Year</td>
<td>129</td>
<td>29.3</td>
</tr>
<tr>
<td>About Once a Month</td>
<td>56</td>
<td>12.7</td>
</tr>
<tr>
<td>Two to Three Times a Month</td>
<td>83</td>
<td>18.8</td>
</tr>
<tr>
<td>About Once a Week</td>
<td>37</td>
<td>8.4</td>
</tr>
<tr>
<td>More than Once a Week</td>
<td>114</td>
<td>25.9</td>
</tr>
<tr>
<td>Total</td>
<td>441</td>
<td>100.0</td>
</tr>
<tr>
<td>Collection and Processing of Genetic Evidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almost Always</td>
<td>80</td>
<td>18.3</td>
</tr>
<tr>
<td>Frequently</td>
<td>137</td>
<td>31.4</td>
</tr>
<tr>
<td>Seldom</td>
<td>139</td>
<td>31.9</td>
</tr>
<tr>
<td>Hardly Ever</td>
<td>80</td>
<td>18.3</td>
</tr>
<tr>
<td>Total</td>
<td>436</td>
<td>100.0</td>
</tr>
<tr>
<td>Satisfaction with Agency Treatment of Genetic Forensic Practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Dissatisfied</td>
<td>12</td>
<td>2.7</td>
</tr>
<tr>
<td>Somewhat Dissatisfied</td>
<td>36</td>
<td>8.2</td>
</tr>
<tr>
<td>Neutral</td>
<td>98</td>
<td>22.3</td>
</tr>
<tr>
<td>Somewhat Satisfied</td>
<td>149</td>
<td>33.9</td>
</tr>
<tr>
<td>Very Satisfied</td>
<td>145</td>
<td>33.0</td>
</tr>
<tr>
<td>Total</td>
<td>440</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 17 – Frequencies and Percentages Agency Genetic Forensic Treatment - Continued
Collection

Concerning who is responsible for evidence collection within the agency, it appears that there is already overlap in responsibility with 59.7-percent (n=243) of patrol officers being responsible for evidence collection, which exceeded the reporting that civilian crime scene technician were responsible with 52.1-percent (n=190) of officers indicating that civilian technicians were responsible for collection. The sworn officer crime scene technician is utilized in appropriately 64.2-percent (n=237) of agencies. Most surprising is the results that 82.9-percent (n=348) of officers indicated that investigators are responsible for evidence collection. While respondents were able to indicate across all roles within the organization, it was surprising to discover that investigators are responsible for evidence collection at this level.

When evaluating those who collect genetic evidence, the vast majority of officers indicated that collection would be rated at “Good” or “Very Good” with 41.1-percent (n=181) and 38.4-percent (n=169) respectively. 18.2-percent (n=80) would rate those responsible for evidence collection at “Fair.” Very few officers expressed ratings of “Poor” or “Very Poor” with only 1.6-percent (n=7) and .7-percent (n=3) responding as such. The complete frequencies and percentages for this subsection are within Table 18.

Table 18– Frequencies and Percentages Agency Genetic Forensic Responsibility

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy Treatment of Genetic Forensic Evidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The agency is expanding policy</td>
<td>140</td>
<td>32.0</td>
</tr>
<tr>
<td>The agency is reducing policy</td>
<td>22</td>
<td>5.0</td>
</tr>
<tr>
<td>The agency is neither expanding nor reducing policy</td>
<td>275</td>
<td>62.9</td>
</tr>
<tr>
<td>Total</td>
<td>437</td>
<td>100.0</td>
</tr>
<tr>
<td>Variable</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----</td>
<td>---------</td>
</tr>
<tr>
<td>Responsible for Evidence Collection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patrol Officers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>164</td>
<td>40.3</td>
</tr>
<tr>
<td>Yes</td>
<td>243</td>
<td>59.7</td>
</tr>
<tr>
<td>Total</td>
<td>407</td>
<td>100.0</td>
</tr>
<tr>
<td>Investigators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>72</td>
<td>17.1</td>
</tr>
<tr>
<td>Yes</td>
<td>348</td>
<td>82.9</td>
</tr>
<tr>
<td>Total</td>
<td>420</td>
<td>100.0</td>
</tr>
<tr>
<td>Sworn Officer: Crime Scene Technician</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>132</td>
<td>35.8</td>
</tr>
<tr>
<td>Yes</td>
<td>237</td>
<td>64.2</td>
</tr>
<tr>
<td>Total</td>
<td>369</td>
<td>100.0</td>
</tr>
<tr>
<td>Civilian: Crime Scene Technician</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>175</td>
<td>47.9</td>
</tr>
<tr>
<td>Yes</td>
<td>190</td>
<td>52.1</td>
</tr>
<tr>
<td>Total</td>
<td>365</td>
<td>100.0</td>
</tr>
<tr>
<td>Evaluation of those who collect Genetic Evidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Poor</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td>Poor</td>
<td>7</td>
<td>1.6</td>
</tr>
<tr>
<td>Fair</td>
<td>80</td>
<td>18.2</td>
</tr>
<tr>
<td>Good</td>
<td>181</td>
<td>41.1</td>
</tr>
<tr>
<td>Very Good</td>
<td>169</td>
<td>38.4</td>
</tr>
<tr>
<td>Total</td>
<td>440</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Respondents were asked to indicate what guided their decision to collect genetic forensic evidence within property crime scenes. Respondents were able to mark any selection within the list and the results determined that in 93.6-percent (n=393) of cases, investigator discretion guides the officer’s decision to collect genetic forensic evidence within property crime scenes. 42.1-percent (n=171) of officers were guided to collected property crime scene evidence by formal agency policy, though 35 respondents did not answer the question. Informal agency policy provided guidance in 55-percent (n=219) of cases, with a non-response rate of 49. Most surprising was the indication that 62.2-percent (n=245) of officers indicated that they collected genetic forensic evidence at the request or guidance from the prosecutor. 28.2-percent (n=55) of
officers indicated that additional sources guided their decision to collect evidence within these scenes, primarily reflecting command staff guidance, crime scene technician quality assessment, budgets, and within the other category, the policy of the crime lab (n=16) dictated if evidence would be collected or processed by the facility. Moreover, several respondents noted that the state lab would only accept samples where there was a known suspect or would not accept genetic forensic evidence for non-personal crimes. The complete frequencies and percentages for this subsection are within Table 19.

Table 19 – Frequencies and Percentages Guidance on Evidence Collection

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency Policy (Formal)</td>
<td>171</td>
<td>42.1</td>
</tr>
<tr>
<td>Agency Policy (Informal)</td>
<td>219</td>
<td>55.9</td>
</tr>
<tr>
<td>Request or Guidance from Prosecutor</td>
<td>245</td>
<td>62.2</td>
</tr>
<tr>
<td>Investigator Discretion</td>
<td>393</td>
<td>93.6</td>
</tr>
<tr>
<td>Other</td>
<td>55</td>
<td>28.2</td>
</tr>
</tbody>
</table>

As discussed within the literature review, there has been considerable progression within policy expansion to see the collection of offender genetic samples, which have placed burdens on agencies and labs to meet the influx of additional samples. When asked about official state policy, 67.5-percent (n=257) of officers indicated that they collect genetic samples from “All Offenders Convicted of a Felony, 59.3-percent (n=213) for “Certain Misdemeanor and/or Felony Convictions”, and only 8.8-percent (n=30) having a complete collection practice for “All Convictions.”

While the collection of genetic samples at the conviction level places minimal burden on the agency, the arrestee level collection policy does see an increased burden. According to respondents, over 40-percent of agencies collect genetic samples “For Certain Misdemeanor and/or Felony Arrests”, 45.8-percent (n=171) and for “All Felony Arrests”, 42.3-percent
(n=170). Very few agencies were required to collect arrestee genetic evidence for “All Arrests” with only 3.6-percent (n=13) reporting such requirements. The complete frequencies and percentages for this subsection are within Table 20.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Policy on Offender Samples</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Arrests</td>
<td>13</td>
<td>3.6</td>
<td>362</td>
</tr>
<tr>
<td>All Felony Arrests</td>
<td>170</td>
<td>42.3</td>
<td>402</td>
</tr>
<tr>
<td>Certain Misdemeanor and/or Felony Arrests</td>
<td>171</td>
<td>45.8</td>
<td>373</td>
</tr>
<tr>
<td>All Convictions</td>
<td>30</td>
<td>8.8</td>
<td>342</td>
</tr>
<tr>
<td>All Felony Convictions</td>
<td>257</td>
<td>67.5</td>
<td>381</td>
</tr>
<tr>
<td>For Certain Misdemeanor and/or Felony Convictions</td>
<td>213</td>
<td>59.3</td>
<td>359</td>
</tr>
</tbody>
</table>

As discussed within the literature review in detail, the utilization of forensic evidence requires considerable resource expenditures, which exceed the pure costs of analysis. Managing genetic forensic evidence is both challenging and complicated in that the utilization of this evidence type involves numerous stakeholders and as such, there are considerable obstacles presented. Respondents indicated that the primary obstacles in managing cases within genetic evidence reflect “Conflicting philosophies between agency and outside lab(s)” and “Lack of money to pay for analyses” with 57.1-percent (n=252) and 53.5-percent (n=236) responding as such. This is a vital point in that as indicated within the IPA interviews, all participants noted how lab policy presented a challenge or as many detailed a “barrier” to property crime scene genetic evidence analysis. Of importance is the point raised, indicating lab policy that would limit processing to only those crimes where a suspect was identified or completely denying submission of property crime scene DNA evidence. Of interest to note is that the conflicting philosophies exceed the economic burden, with 53.5-percent (n=236) of officers expressing that “Lack of money to pay for analysis” was a primary obstacle. While the margin of error (4.3%) could reflect lab policy (both formal and informal) and resource expenditures at nearly identical
levels, this is a very important contributory finding in that lab policy, as an external stakeholder, presents a primary obstacle. 35.6-percent (n=157) expressed that there was “Not enough communication between forensic analysts and investigators” and while communication is vital, this was not strictly reserved to personal communications. 33.8-percent (n=149) of officers expressed that the computer and technology systems were an obstacle within managing cases. 30.6-percent (n=135) of officers noted that a “failure to withdraw evidence prior to analysis” (when the case was solved) presented an obstacle. As noted in the IPA interviews and as expressed within the open-ended content analysis, this often presented a challenge in that an agency who had solved a case, believing the analysis was not needed, would still incur the budgetary loss.

Concerning internal obstacles, 20.6-percent (n=91) of officers indicated that there were “Conflicting philosophies regarding prioritization of cases” within the agency, including 18.4-percent (n=81) expressing that “Differing views within the agency on the usefulness of DNA evidence” presented an obstacle. Moreover, 16.3-percent (n=72) of officers indicated that “Lack of follow up by investigators after DNA results are received” presented an obstacle to successful utilization of this evidence type.

The content analysis of the “other” answer category indicates that predominately the lab backlog, facility policy on the prioritization of cases, and agency treatment are the primary obstacles. Officers expressed backlogs of 2-3 years and on average a year or longer to see a sample processed, often including violent crime samples. The following statements provided by officers summarizes nearly the entire field of responses.

“Our state lab added additional personnel to help ease the backlog but then our corresponding increased use of DNA analysis has slowed the process back down. Five years ago, DNA was primarily used solely for major crimes of violence against people. Now we routinely collect and submit for cases involving property crimes (felony only).”
“We are able to call the analysts directly. The Lab does not take any sample we’d like to submit. On major crimes cases, we are required to have a meeting to discuss the case and narrow down the evidence that can be submitted. We are only able to submit 9 evidence items (does not include victim, suspect or witness DNA standards) at a time.”

Additionally, a respondent indicated that in a burglary case where they had a suspect identified, the sample took a year to be analyzed. As discovered within the IPA interviews and expressed within the survey, there is a considerable conflict between the agency and the laboratory, where lab policy has come to shape organizational practice within the treatment of genetic forensic evidence. The complete frequencies and percentages for this subsection are within Table 21.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Obstacles Managing Cases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conflicting philosophies regarding prioritization of cases</td>
<td>91</td>
<td>20.6</td>
</tr>
<tr>
<td>Conflicting philosophies between agency and outside lab(s)</td>
<td>252</td>
<td>57.1</td>
</tr>
<tr>
<td>Differing views within the agency on the usefulness of DNA evidence</td>
<td>81</td>
<td>18.4</td>
</tr>
<tr>
<td>Too many evidence samples collected for cases</td>
<td>123</td>
<td>27.9</td>
</tr>
<tr>
<td>Inappropriate communication between forensic analysts and investigators</td>
<td>67</td>
<td>15.2</td>
</tr>
<tr>
<td>Not enough communication between forensic analysts and investigators</td>
<td>157</td>
<td>35.6</td>
</tr>
<tr>
<td>Lack of follow up by investigators after DNA results are received</td>
<td>72</td>
<td>16.3</td>
</tr>
<tr>
<td>Failure to withdraw DNA analysis request prior to analysis (Case Solved)</td>
<td>135</td>
<td>30.6</td>
</tr>
<tr>
<td>Lack of interoperability between agency and forensic lab systems</td>
<td>149</td>
<td>33.8</td>
</tr>
<tr>
<td>Lack of confidence in available labs</td>
<td>34</td>
<td>7.7</td>
</tr>
<tr>
<td>Lack of money to pay for analyses</td>
<td>236</td>
<td>53.5</td>
</tr>
<tr>
<td>Other (please explain):</td>
<td>30</td>
<td>6.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>441</td>
<td>100</td>
</tr>
</tbody>
</table>

A final item asked to officers within this subsection, reflected at a training level concerning familiarity with utilizing a "John Doe" warrant or CODIS warrant. As discussed prior, a CODIS warrant freezes the case in time. In essence, the DNA of the individual is charged with perpetrating the crime and when a match occurs, the clock restarts. By submitting a CODIS warrant, officers are able to side step the statute of limitations for cases. As discovered, very few
agencies utilize CODIS warrants within property crime scenes. In fact, 83.6-percent (n=366) indicating that they are aware of no one in the organization filing such a warrant within a property crime scene.

**Table 22 – Frequencies and Percentages CODIS Warrants**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>72</td>
<td>16.3</td>
</tr>
<tr>
<td>No</td>
<td>366</td>
<td>83.6</td>
</tr>
<tr>
<td>Total</td>
<td>438</td>
<td>100</td>
</tr>
</tbody>
</table>

**Lab Information**

The following subsection provides information on the utilization of the lab and the working relationship between the agency and facility. Concerning laboratory utilization, respondents were asked to indicate who performs genetic forensic analysis for the agency. Results indicated that predominately agencies utilize a state facility for their analysis across all crime samples (n=295). Agencies fortunate to have in-house facilities reflected nearly 20-percent of the sample (n=84). While agencies did utilize the federal laboratory, no agency indicated utilizing the facility for property crime analysis. Agencies indicating the use of a private laboratory to process property crime evidence was rare with only 9-percent (n=40) indicating as such.

When asked to evaluate the accessibility of the lab facility, 76-percent (n= 333) found the facility to be accessible reflecting in the ability to talk to analysts directly or submit *any* sample to the facility. It must be noted that this question reflects the submission of any sample, not just property crime scene evidence. The working relationship according to officers in the survey, indicates that the communication between the agency and the lab is satisfactory, with only 6-percent (n=26) indicating that communication was “*very poor*” or “*poor*.” The complete frequencies and percentages for this subsection are within Table 23.
Table 23 – Frequencies and Percentages Lab Facility Relationship

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accessibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Accessible</td>
<td>161</td>
<td>36.8</td>
</tr>
<tr>
<td>Somewhat Accessible</td>
<td>172</td>
<td>39.3</td>
</tr>
<tr>
<td>Neutral</td>
<td>56</td>
<td>12.8</td>
</tr>
<tr>
<td>Somewhat Inaccessible</td>
<td>35</td>
<td>8.0</td>
</tr>
<tr>
<td>Very Inaccessible</td>
<td>14</td>
<td>3.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>438</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Good</td>
<td>128</td>
<td>29.2</td>
</tr>
<tr>
<td>Good</td>
<td>178</td>
<td>40.5</td>
</tr>
<tr>
<td>Fair</td>
<td>107</td>
<td>24.4</td>
</tr>
<tr>
<td>Poor</td>
<td>20</td>
<td>4.6</td>
</tr>
<tr>
<td>Very Poor</td>
<td>6</td>
<td>1.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>439</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Officer Perspective**

This subsection provides the results of the questions specific to the officer’s perception on the treatment of genetic forensic evidence within property crime scenes. The questions reflect their current collection practices, the effectiveness of genetic forensic evidence in these cases, the expansion of the treatment, influences on the decision to collect, and familiarity with current research.

Specific to prior utilization of genetic forensic evidence within property crime scenes, 48.7-percent (n=214) of officers noted that they have called for collection and processing of genetic evidence in “Less than 10-percent of property crime cases.” While an observer may deem this low, this is an important finding in that the current recovery rate of suitable genetic evidence is approximately 11-percent (as discussed prior). 19.6-percent (n=86) of officers have requested analysis within “10 to 25-percent of property crime cases”, and only 6.2-percent (n=27) of officers have called for analysis evidence in “50-percent or more property crime
cases.” However, 18.5-percent (n=81) of officers did indicate that they have not requested DNA evidence to be analyzed.

### Table 24 – Frequencies and Percentages Requests for Collection and Processing

<table>
<thead>
<tr>
<th>Requests for Collection and Processing</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have not requested DNA evidence be collected and processed</td>
<td>81</td>
<td>18.5</td>
</tr>
<tr>
<td>Less than 10-percent of property crime cases</td>
<td>214</td>
<td>48.7</td>
</tr>
<tr>
<td>10 to 25-percent of property crime cases</td>
<td>86</td>
<td>19.6</td>
</tr>
<tr>
<td>More than 25-percent, but less than 50-percent of property crime cases</td>
<td>31</td>
<td>7.1</td>
</tr>
<tr>
<td>50-percent or more property crime cases</td>
<td>27</td>
<td>6.2</td>
</tr>
<tr>
<td>Total</td>
<td>439</td>
<td>100.0</td>
</tr>
</tbody>
</table>

When asked if officers believe genetic forensic evidence assists in apprehending offenders with property crime scene cases, 80-percent, the majority of respondents, indicated that it is helpful. Moreover, 41.5-percent (n=182) expressed genetic evidence is helpful “A great deal” and 39.4-percent (n=173) indicated it is helpful “A fair amount.” 16.6-percent (n=73) believed that genetic evidence was not very helpful within these cases and 2.5-percent (n=11) expressed it was rarely if ever helpful.

Officers were then asked their perception on if they favored or opposed expanding genetic forensic evidence analysis within property crime scenes, first with no additional funding source and then with a specific funding allotment attached to the expansion. 64.6-percent (n=285) of officers “strongly favor” the expansion of genetic analysis within property crime scenes. Moreover, 23.1-percent (n=43) indicating that they “somewhat favor” expansion. Less than 2-percent (n=11) “somewhat oppose” or “strongly oppose” such expansion without a funding allocation. Equally important in this analysis is that every respondent answered the question. When an appropriate funding source was provided, 75.5-percent (n=332) of officers “strongly favor” expansion, an increase of nearly 11-percent. In fact, 93-percent (n=413) of officers indicated that they favor expansion of genetic analysis within property crime scenes.
Recognizing that officers favor expansion of genetic analysis, it becomes important to analyze their perception on expanding collection at the officer level. 36.6-percent (n=161) of officers were “very much in favor” of seeing responsibility for collection extended to the officer level. Additionally, 23.4-percent (n=103) indicated that they are “somewhat in favor” of this responsibility being extended to them. 19.8-percent (n=87) were “neutral” in extending the responsibility to officers. 12.7-percent (n=56) “somewhat oppose” and 7.5-percent (n=33) “very much oppose” placing officers responsible for evidence collection. The complete frequencies and percentages for this subsection are within Table 25.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
<th>%Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expansion of Genetic Forensic Evidence – No Funding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly favor</td>
<td>285</td>
<td>64.6</td>
<td></td>
</tr>
<tr>
<td>Somewhat favor</td>
<td>102</td>
<td>23.1</td>
<td></td>
</tr>
<tr>
<td>Neither favor nor oppose</td>
<td>43</td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>Somewhat oppose</td>
<td>8</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Strongly oppose</td>
<td>3</td>
<td>.7</td>
<td></td>
</tr>
</tbody>
</table>
The collection of genetic forensic evidence presents several challenges. According to officers, the most pressing challenges reflect training, with 68.9-percent (n=304) of officers expressing the need for “Better training within evidence collection techniques.” This was closely followed by 56.2-percent (n=248) of officers wanting “Better training within evidence submission and analysis process.” As indicated in the prior analysis, those responsible for collection of evidence, predominately reflected those sworn personnel and as such the third highest rated challenge reflected “Difficulties in identifying possible biological evidence” with 51.2-percent (n=215) of officers expressing this challenge. The remaining challenges identified by respondents reflected evidence collection, scene contamination, and as detailed within the IPA interviews, storage space or more specifically insufficient storage space for genetic evidence.

Content analysis of the other category item suggests that the laboratory policy and resources within the laboratory presents a considerable challenge for agencies. The following statements reflect the range of challenges and reflect the core themes that inhibit expansion as noted within the IPA thematic analysis.
“Crime scene contamination by first responding patrol officers and victim residents prior to trained investigators arriving at the scene. Lab technicians with my agency, as with most agencies will not respond to the scene of a simple burglary.”

“Currently our state lab, due to overwhelming submissions, will not, in most cases analyze property crime DNA evidence. An extraordinary situation would have to exist for them to do so.”

“DNA processing is available for all violent crimes but we do not normally process touch DNA on property crimes due to the labs policy. We do not do in house DNA processing with the exception of sample collection.”

“The primary problem becomes a back log at the state lab for the processing of DNA evidence. Most property crimes involve what is termed here as “touch” DNA. Due to the high volume of DNA submissions, “Touch” DNA can only be submitted at the request of the Commonwealth Attorney by signed letter-head. This is not an overly oppressive problem except when the priorities of the case differ between the prosecutors and law enforcement.”

As the excerpts note, there is overlap within scene contamination but within the majority of statements provided by officers, the laboratory presents a considerable challenge, which is complicated by the additional local policies that have emerged concerning property crime scene evidence. For example, as described above by an officer, having a formal written request by the Commonwealth Attorney is bound to present a challenge and inhibit expansion. Likewise, several officers indicated that a challenge is the increase in collection resulting from collecting the homeowners and additional occupants DNA for comparison and removal to identify the suspect sample. The collection/analysis and elimination of DNA samples as several officers mentioned presents a challenge beyond the laboratory. In this situation, in processing genetic evidence within these cases, officers must first convince victims to provide samples, including additional occupants, and then must submit all of those samples to the lab for elimination analysis to identify the suitable sample reflecting the potential suspect. Training, scene contamination, increased collection, willingness of the victim to submit samples for analysis, and
local policy all present challenges to an agency, which will only become more complicated within the storage space provided for genetic evidence.

Currently, collection and analysis depend greatly on several factors and while no uniform collection policy seems to emerge within the research, the reality that agencies are already experiencing insufficient storage space, with 34.0-percent (n=150) indicating as such, any future expansion will need to accommodate for the vast increase in samples needing storage. The complete frequencies and percentages for this subsection are within Table 26.

| Table 26 – Frequencies and Percentages Challenges within Collection |
|-------------------------|------------|-------|
| Variable | N | Percent |
| Challenges within Collecting Genetic Forensic Evidence within Property Scenes | | |
| Difficulties in identifying possible biological evidence | 215 | 51.2 |
| Evidence collection techniques | 121 | 27.4 |
| Evidence contamination | 175 | 39.7 |
| Evidence packaging | 81 | 18.4 |
| Problems with the availability of proper collection kits/tools | 127 | 28.8 |
| Insufficient storage space for DNA evidence | 150 | 34.0 |
| Better Training within evidence collection techniques | 304 | 68.9 |
| Better Training within evidence submission and analysis process | 248 | 56.2 |
| Crime scene contamination | 157 | 35.6 |
| Other | 38 | 8.6 |

* All respondents responded (n=441)

Concerning stakeholder influence, 84-percent (n=368) of officers indicated that investigators expressed the highest influence on the decision to collect genetic forensic evidence. Crime scene technicians expressed a strong influence with 73.5-percent (n=302) of officers denoting that the evaluation of the technician would influence their decision to collect evidence within property crime scenes. Patrol officer influence can be viewed as moderately strong. Concerning those stakeholders with moderate influence, the command staff, reflecting the Captain and Police Chief possess nearly identical levels of influence. Of those with the least influence on officer decision-making are the victim and victim advocate, whose role can be said to be very weak. As noted prior, the prosecutor’s office does influence the collection of evidence
with 62.2-percent of officers indicating how the office has guided agency policy both formal and informal. The relative influence of the office as displayed here can be said to be moderate. The complete frequencies and percentages for this subsection are within Table 27.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>N</th>
<th>Strong</th>
<th>Moderate</th>
<th>Weak</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patrol Officer</td>
<td>438</td>
<td>43.8</td>
<td>30.1</td>
<td>19.2</td>
<td>6.8</td>
</tr>
<tr>
<td>Investigator</td>
<td>438</td>
<td>84.0</td>
<td>12.8</td>
<td>2.5</td>
<td>.7</td>
</tr>
<tr>
<td>Captain</td>
<td>417</td>
<td>34.8</td>
<td>24.7</td>
<td>17.5</td>
<td>23.0</td>
</tr>
<tr>
<td>Police Chief</td>
<td>427</td>
<td>39.1</td>
<td>17.3</td>
<td>18.7</td>
<td>24.8</td>
</tr>
<tr>
<td>Crime Scene Technician</td>
<td>411</td>
<td>73.5</td>
<td>11.9</td>
<td>3.2</td>
<td>11.4</td>
</tr>
<tr>
<td>Prosecutor</td>
<td>434</td>
<td>42.2</td>
<td>29.3</td>
<td>15.0</td>
<td>13.6</td>
</tr>
<tr>
<td>Victim Advocate</td>
<td>423</td>
<td>4.3</td>
<td>13.7</td>
<td>29.8</td>
<td>52.2</td>
</tr>
<tr>
<td>Victim</td>
<td>427</td>
<td>11.2</td>
<td>24.8</td>
<td>35.6</td>
<td>28.3</td>
</tr>
</tbody>
</table>

When presented with a preset list of influences, 82.8-percent (n=252) of officers expressed that they would collect evidence if requested by the prosecutor, while only 33-percent (n=132) would collect evidence at the request of a victim. Those primary influences reflected identification of the suspect, similar scene characteristics, and high property crime loss, with over 70-percent of officers indicating it would influence them to collect evidence. The content analysis of the other category, once again denotes the relative influence of lab policy. Officers acknowledged that if there is evidence it will be collected, but because of lab policy, what is collected is rarely being submitted for processing. The relative influence of the laboratory facility does influence officer decision making. The following excerpts express the perceptions of respondents.

“We recommend collection in all cases if applicable, although our state crime lab does not process DNA on misdemeanor cases.”

“We do collect them but we can’t send all to lab for testing because of backlog. They stay in property until a suspect is identified. If he/she doesn’t confessed, they sent for testing.”
“Until our state lab can do the analysis it does not matter what anybody else wants.”

“Our State lab will only process person crimes.”

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property loss is high (&gt; $5,000)</td>
<td>342</td>
<td>78.6</td>
<td>435</td>
</tr>
<tr>
<td>Characteristics of the crime scene are similar to other cases</td>
<td>396</td>
<td>90.6</td>
<td>437</td>
</tr>
<tr>
<td>A suspect has been identified</td>
<td>345</td>
<td>79.9</td>
<td>432</td>
</tr>
<tr>
<td>Suspect has not been identified</td>
<td>314</td>
<td>73.5</td>
<td>427</td>
</tr>
<tr>
<td>Analysis requested by the prosecutor</td>
<td>352</td>
<td>82.8</td>
<td>425</td>
</tr>
<tr>
<td>Analysis requested by the victim</td>
<td>139</td>
<td>33.0</td>
<td>421</td>
</tr>
<tr>
<td>Other</td>
<td>30</td>
<td>16.9</td>
<td>178</td>
</tr>
</tbody>
</table>

A theme emerging within the IPA interviews was that of a process aptly named

“Simulated Evidence Collection.” A term coined reflecting the decision to swab, powder, or collect nonviable samples to demonstrate that the victim received the full resources of the agency. In some cases, evidence could be collected with no intent of formally processing the evidence. While the majority of officers indicated that they are not familiar with an officer engaging in this practice at 70.7-percent (n=309), 29.3-percent (n=128) admitted having engaged in the practice or of knowing of an officer who has done so at a scene. This is a surprising result in that prior research has expressed considerable backlogs within evidence rooms pertaining to untested samples.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulated Evidence Collection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>128</td>
<td>29.3</td>
</tr>
<tr>
<td>No</td>
<td>309</td>
<td>70.7</td>
</tr>
<tr>
<td>Total</td>
<td>437</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The final question asked reflected their familiarity with the national DNA Field Experiment. The importance of this question within the research specifically highlights how knowledge transference takes place from the National Institute of Justice to agencies and
officers. A significant disconnect would establish that important information is not making it to
the officer level from national reports. While it was anticipated that few officers would be aware
of the study, the results of this research denotes that 92.4-percent (n=403) of officers have no
familiarity of the national report. This is alarming considering the amount of resources dedicated
to informing law enforcement of the results via reports, presentations, and the creation of a
training curriculum specific to property crime scene DNA evidence.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity with the “DNA Field Experiment”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>33</td>
<td>7.5</td>
</tr>
<tr>
<td>No</td>
<td>403</td>
<td>92.4</td>
</tr>
<tr>
<td>Total</td>
<td>436</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Mixed-Methods Analysis**

In concert, the national survey and IPA interviews have identified several unique factors,
which when reported across both methods offer improved reliability and validity. As noted
within prior research, discretion of the responding officer has the greatest influence over if
evidence is collected. However, concerning processing of such evidence, the relative influence of
the laboratory facility, officer training, and prosecutor are highly contributory. Universally across
all interview participants, the role of the laboratory was a common source of discussion. The
ability for the lab to dictate submission policies placed considerable influence on officers when
determining the relative worth of evidence. Moreover, when discussing the importance of genetic
forensic evidence within property crime scenes, police officers, command staff, and forensic
technicians expressed the importance of the evidence type to varying levels.

Over 80-percent of officers within the national survey indicated that they believed this
evidence type to be “helpful” in solving property crime cases. Additionally, over 80-percent of
officers favor expansion of genetic analysis within property crime scenes without changes to current funding practices. With funding added, the favor rate exceeded 90-percent. Within both the survey and as discussed with the interview participants, the majority of officers also favored being responsible for evidence collection. The national survey results indicated that over 50-percent would take on that role, with 20-percent neutral. This was originally surprising until it was reported within the national survey that over 80-percent of investigators are currently responsible for evidence collection at some level.

While officers favored expanding into property crime scene collection and analysis, a universal challenge emerging within the research is the need for better training within evidence collection techniques. Recognizing the role officers have come to hold within evidence collection of low-level scenes, there is a clear need for better training. Few officers reported the quality of training as exceptional and this was compounded by the lack of familiarity with CODIS warrants and identification of evidence at property crime scenes.

The importance of improved training is incredibly poignant considering the levels as reported in the national survey with 82.9-percent of respondents indicating that investigators were responsible for evidence collection to some degree. As agencies consider grappling with reduced budgets and increased expectations and pressures to utilize forensics, the natural response has been to assign additional tasks to the officer level, which has included low-level genetic collection. This is further complicated by the reality that over 90-percent of officers have no familiarity with the national DNA Field Experiment or as discussed within the IPA interviews, the free training provided on genetic forensic analysis within property crime scenes. As the disconnect emerged within the IPA interviews, it was assumed that it was isolated to the participants. However, to see unfamiliarity levels as reported within the national survey at that
level was unimaginable considering the funding expenditures that took place to disseminate the information to law enforcement practitioners.

As a unique theme, the influence of the community was denoted often within the IPA interviews. Their relative influence was said to influence officers and forensic technicians leading to a phenomenon conceptualized as “simulated evidence collection.” The results of the national survey indicated that victims have a weak influence on officer decision making, which when framed within the IPA interview contexts suggests that the primary influence of the community is not the actual victim but the perception the officer holds on displaying modernity. The victim may request evidence be collected but the decision to collect is not facilitated by the appeasement of the victim but rather the ability to display the skills necessary to undertake evidence collection by the officer or to call for collection an evidence technician to process the scene. It can be said that the CSI effect has influenced the very officers it portrays.

The influence of the prosecutor’s office was highlighted across the entire stakeholder continuum within the IPA interviews and within the national survey. The majority of officers did indicate that the office influenced their decisions to collect. However, it is important to denote that the influence was not prior to their involvement, meaning the influence of the prosecutor was not indirect. Rather, the influence of the prosecutor was primarily displayed when they requested information be collected at a scene, often indicated by calling for additional processing, before they would accept a case. Additionally, while the influence was deemed moderate, several officers expressed their frustration that they needed to seek the formal approval of the office to submit property crime genetic evidence. At this level, the prosecutor can be said to have a significant influence.
A final unique point offered within both the IPA interviews and the national survey is the influence of the laboratory. Across each method, the results identified clear examples of how lab policy not agency policy would dictate what is collected and processed. Often officers expressed their frustration because the facility would not process samples unless there was a suspect or would not process property crime scene samples regardless of case characteristics. In fact, when asked what were the primary obstacles, respondents within the national survey indicated that the conflicting philosophies between agency and outside lab(s) presented the most challenge, exceeding the lack of money. It is important to highlight that several IPA participants noted that they did not pay for processing and yet still were not involved within processing genetic evidence within these cases. While the explanations offered were understandable, the reality of the influence the laboratory holds over collection and processing is remarkable.
Chapter 6

Summary and Conclusions

While prior studies have introduced academics and practitioners to the current policy and utilization of forensic evidence, unexamined were the external, organizational, and personal factors that influenced an officer’s decision to collect or have collected genetic forensic evidence within property crime scenes. Moreover, often missing in the discourse of the topic was the involvement of those investigative stakeholders. Prior research had surveyed these stakeholders, but few have directly engaged them to listen to the challenges, the issues, and the opportunities reflecting in the treatment of genetic forensic evidence. By building on prior research, the intent of this dissertation was to identify those factors influencing the collection of this evidence type to add to the discourse within the treatment genetic forensic evidence receives across the crime continuum.

Despite a wealth of research on forensic analysis, the primary contribution of the prior forensic literature has been to depict the state of forensic backlogs, source of such backlogs, and to denote the investigative benefit of forensic practices (Strom & Hickman, 2010). The outcome while incredibly significant to academics and practitioners has been unable to peer into the “black box” of evidence processing, to offer exploratory and explanatory factors that influence an officer’s decision across the investigative stakeholder continuum, reflecting the officers, the command staff, forensic technicians, and prosecutors.

This present study utilizing a mixed-method research design has provided both a qualitative and quantitative exploration into those influences denoting specific factors that influence the decision to collect genetic forensic evidence and introducing additional factors solely missing from the discourse within forensic evidence collection. The IPA interviews
revealed a wealth of information, highlighting the experiences, perceptions, and the frustration of those within the investigative stakeholder continuum. Officers, detectives, command staff, civilian forensic technicians, and prosecutors are fully aware of the inherent benefits affording the expanded utilization of forensic evidence within these crime scenes, but the practical reality of the day-to-day operations of their respective agencies, offices, and tasks inhibit expansion. As discovered, there are external, organizational, and individual factors that influence decision making, and specific to officer decision making within collection, the external factors are suggested to have the greatest influence at an exploratory level.

Officers indicated that collection of genetic forensic evidence within property crimes scenes is routine. Moreover, officers see themselves currently being tasked with collecting forensic evidence, are not resistant to such tasks, and even support expanding collection because they see the worth of such evidence. However, the challenge is not convincing officers of the worth of this genetic evidence, but within seeing evidence collected, *processed*, which is the primary inhibitor of collection practices. To collect evidence to see it sit within the evidence room is defeating of the purpose of forensic evidence within the investigative process and potentially opens up a line of questions from the defense, in why evidence was collected and not processed. As expressed within the IPA interviews, at the command staff and prosecutorial level, the fiscal reality presents a challenge and while agencies are collecting evidence, that evidence is not being processed, which potentially creates a negative feedback loop ensuring that future evidence is less likely to be collected.

*Looking Forward: Challenging the Dominant Paradigm of Police Practice*
The fiscal challenges cannot be diminished as an inhibitor. Expanding forensic analysis into property crime scenes will be expensive. A crude mathematical analysis denotes that on average it will cost nearly 900 million dollars to expand into property crime scenes at the present processing costs. If forensic processing were capable of achieving the optimum level, identified by the $1,000.00 efficiency level as discussed within the literature review, the average cost nationally would reflect ~240 million dollars. While it is easy to highlight rough estimates of processing costs, it is not without consideration that administrators are limited by often fixed budgets. Expanding processing cannot be done swiftly and without proper planning. However, to use cost as a barrier to limit the expansion undermines the clear benefits that expansion affords an agency.

As discussed prior, the Denver study revealed a cost savings of more than $5 million in police costs and $36.8 million in property loss prevented by the expansion in processing of forensic evidence within property crime scenes (Ashikhmin, Berdine, Morrissey, & LaBerge, ND). While not all agencies were capable of achieving the same results, at a comparative level the expansion within the treatment of genetic forensic evidence, clearly denotes a cost-benefit supporting expansion. The challenge that police administrators and the legislature must overcome is that the inherent benefits are not immediate, nor are they highly visible to the community. A prevented crime is a crime that garners little public attention unless linked to a specific intervention (i.e., an offender apprehended before to committing an offense). Moreover, a formal criminal justice intervention into the offending cycle of a burglar receives the immediate benefits when prolific but to intervene and subsequently prevent potentially upwards of a hundred burglaries has little lasting impact on the community or even the officers who work the case as the benefits are not immediate. Scholars no doubt will seek to examine the deterrence
capability of a fully integrated and uniform treatment of genetic forensic evidence within this crime type. However, most pressing on the police administrator is recognizing that while the benefits to clearance rates and cold case resolutions will be immediate, the cost savings will not manifest directly in the budgets of the agency.

One of the best analogies offered on the police is that they are akin to an emergency room. A product of their environment and the tasks they engage, the outcome is decision-making focused on the immediate, not long-term, which is not a product or an indication of some shortsighted limitation but a result of the practical reality of the day-to-day operations of the agency. To ask police administrators to trust in research, to expand processing, to treat all evidence types as equal asks much from them. The benefits are clear but there are other problems that inhibit expansion. Most centrally are the forensic labs across the nation. As the results of the national study indicate, nearly a quarter of officers indicated that collection within property crime scenes of genetic forensic evidence occurred on average once a week or more. 63-percent indicating collection levels of once a month or more. Despite clear collection practices, even if an agency seeks to employ a full collection practice, lab policy and philosophy on the processing property crime scene evidence presents the primary barrier to expansion.

Looking Forward: The Lab and the Lab Technicians

As indicated in this research, it is suggested that lab policy inhibits processing of genetic forensic evidence within property crime scenes. There are several specific examples from officers across the nation suggesting that lab facilities would only process genetic forensic evidence when a clear suspect is identified. With this simple policy, full treatment of forensic evidence is stalled. Fundamentally, a forensic identification system can exist to link offenders to scenes or scenes to individuals, the current treatment of genetic forensic evidence has created a
system that undermines itself by the very practices it employs. Moreover, the increased collection of offender, arrestee, and suspect genetic samples has inundated the lab with increased processing as well as an increased focus on testing synthetic Cannabinoids, as indicated within the IPA interviews.

Further limiting forensic processing is the unfamiliarity of the command staff with the workload and requirements of their forensic technicians, be they local staff or on-call personnel. Forensic technicians have seen their workload and responsibilities greatly increased. In addition to being understaffed and often viewed as a burden on an agency (a feeling expressed in all interviews), forensic technicians enjoy the responsibility having multiple responsibilities. As discussed by each of the forensic experts, a technician can be responsible for evidence collection, evidence packaging and transport, evidence processing, acting in the capacity as a supply repository for officers, conducting training, conducting interviews for public relations, testifying in court on evidence they collected, and testifying in court when requested to explain why evidence was not present at a scene or on a person (negative evidence testimony), and for many technicians, being on-call to assist other agencies. The multiple “hats” that a forensic technician wears within the organization is apparent in the seemingly increased role within collection that officers have as indicated in the research.

Unlike officers who can end a shift and the next set of calls will go to a new patrol officer or the detective who is unable to be assigned a new case because of his or her current caseload, the work of a forensic technician never ceases. To see the expansion of forensic evidence collection within these incidents is to make clear modifications within the treatment of forensic evidence, which transitions well into the policy recommendations section.

Policy Recommendations
Practical benefits at the officer or agency level are not more arrests or better case clearance rates but less work on the part of the officer. The reality of genetic forensic evidence and the expansion of such practice is that there is clearly more work on the part of the administrator to appropriately staff forensic technicians and more work on the part of the officer who may be required to collect evidence or wait for a forensic technician to arrive at the scene. However, currently as indicated within the present research, officers are supportive of expansion and believe that such expansion is warranted.

Traditionally, research has provided that more funding must occur to see expansion and I find that recommendation to be irresponsible and short sighted. Currently, states spend annually over a billion dollars on forensic analysis. Providing more funding without specific recommendations on where that funding is allocated simply ensures that the current CODIS system will maintain its inefficiency.

Recommendation – Appropriate Collection and Retention of Offender Samples

The primary source of conflicting philosophy is not solely the view that property crime scenes are “lesser than.” Officers believe expansion is warranted, as do the forensic experts involved. The overburdened crime labs and conflicting philosophy are so because of continued expansion of collection and retention policies that have witnessed collection move from the felony offender to the misdemeanor offender, to the arrestee, to now the suspect level. It is at this level that often policy recommendations are made to allocate more funding to CODIS, which would not address the overwhelming issue that the expansion of individual DNA sample collection has stemmed the utilization of CODIS and thus the processing of scene samples. The myopic and dangerous precedent being set across the nation is done so out of misplaced fear.
The continued expansion of individual genetic sample retention policies have fostered a conflict wherein scene samples see extremely long turnarounds in processing, denied processing (i.e. when lab policy dictates that a suspect must be identified for processing to occur), and the outlook is to connect the offender to prior violent crimes within the system. As detailed in the prior sections, there is considerable evidence suggesting that processing property crime scene evidence is advantageous to intervening in subsequent offending and clearing cold cases. If a person is in fact guilty of the crime for which they are convicted then their genetic information will be entered into CODIS. The current practice has created a system that sets a dangerous precedent and undermines the efficiency of the CODIS system.

To improve both collection and processing of genetic forensic evidence within property crime scenes, it is recommended that states repeal their laws moving collection to the arrestee and suspect levels. Those convicted of offenses will see their genetic profiles collected and retained within the CODIS system. The current movement to expand the collection and retention of genetic profiles has inundated labs with samples only further forcing them to prioritize cases at the detriment of scene samples. Moreover, a policy that allows for the collection of genetic profiles for comparison within CODIS is ripe for abuse. Over the last few years, police in the United Kingdom have been accused of arresting individuals simply to obtain the genetic profile (BBC News, 2009). Be these allegations true or false does not change the likelihood that there is potential for great abuse. Moreover, such a practice even suggested at an agency within the United States would only further undermine the delicate state of trust that law enforcement hold within their use of technology.

In making this recommendation, not absent is the recognition that legislatures have used this topic as a political tool to garner votes. To them I offer that to re-appropriate funding to
scene processing provides significantly better press statements and stump speeches when they are able to highlight cases involving a habitual offender apprehended versus the collection and retention of Johnny Criminal, whose encounter with the criminal justice system cost the state considerable funds and who is highly likely to never recidivate again (within the context of states that collect and retain at the misdemeanor offense level).

Subsequently, to offer for a revision to the current collection and retention statutes, it is a necessary and controversial recommendation that seeks to better align evidence collection practices. As such, the following recommendation details the rationale for transitioning evidence collection responsibilities to that of the patrol officer.

**Recommendation – Alignment of Evidence Collection at the Patrol Level**

While revising collection practices at the legislative level could be argued to be the most complicated of practical recommendations, re-appropriating forensic evidence collection at the officer level is the most complicated of philosophical recommendations. As the results of the NIJ study indicated, officers trained within evidence collection were capable of collecting the same quality of sample as a certified evidence technician (Roman, Reid, Reid, Chalfin, Adams, & Knight, 2008). As indicated in the national survey and the interviews, officers are willing to take on the role and in many cases are currently trained to process minor level incidents. It is important to highlight that the alignment of forensic evidence collection within the patrol level is not designed to replace the civilian forensic technicians, trained and knowledgeable in the techniques and developments specific to violent crimes and evidence recovery, such as homicides, sexual assaults, and other high-level personal crime offenses. To expand evidence processing within property crime scenes and not align evidence collection of this crime type at
the patrol level will require additional hiring of forensic technicians, who will not have the latitude that officers presently have within the organization.

In making this recommendation, it is important to highlight that in addition to improved training across all aspects of genetic forensic evidence, (a point officers noted within the research), it will prove necessary to revise the academy and police training commissions. To assign this task to officers and improve training within the agency is to miss the opportune moment to ensure that officers are as prepared to handle genetic forensic scenes as they are in handling issues within search and seizure. Like issues within the fourth Amendment, it is imperative that training commissions develop standard operating procedures for the handling of genetic forensic evidence.

*Democratic Policing Theory and Officer Collection*

In making such a recommendation to expand the role of collection to officers, it is not without the consideration that the inclusion of forensic science within law enforcement was meant to epitomize democratic policing (and by extension criminal justice systems). Such a practice was meant to provide an accountable, verifiable, and reliable means of establishing innocence wherein abuse, misconduct, and corruption need not exist to see a successful resolution to a crime incident (Uildriks, 2009). Several scholars will likely argue that in doing so, the opportunity for vast abuses and corruption only increase. Their skepticism is both warranted and valid at the present state. To assign the task of evidence collection to officers certainly places great trust in officers. However, currently officers are engaged in such collection practices and in many areas, they exceed the collection beyond that of the civilian technician. As discussed within the prior chapter, the current cases of error are not at the officer level; rather they are within the lab facility.
While forensics is said to epitomize democratic policing, it did so as a means of avoiding abuses, wherein the police could resort to abuse or at the end of the continuum unmitigated fraud to see a conviction. Technology continues to influence the police organization and while it has not transformed the day-to-day roles and responsibilities of officers, forensic processing has the capability of transforming the organization. In moving evidence collection to the officer level, it forces a national change within organizations, to align agencies with technology in such a way that is not purely symbolic. Any organization that witnesses a 2-fold increase in clearance rates for property crime scenes will be viewed as not just effective, but progressive.

To counter the skepticism that officers, responsible for evidence collection, is unacceptable because of the potential for misconduct, I offer these points. 1) Officers are currently collecting such evidence across the nation and by some accounts have been doing so for some time. Recognizing that officers are involved in this collection and that the issues present have been at the lab, suggests that officers are less likely to manufacture genetic evidence. I concede that absence of widespread misconduct is not proof that it is not occurring but if it were occurring, it would be at present a considerable issue within research. 2) Officers have been collecting both fingerprints and blood and other fibers for decades and while we have examples of misconduct, those issues primarily reflected prosecutorial misconduct or forensic experts who were presenting opinion as fact. 3) Arguably, the most important point, forensic evidence is not proof. Forensic evidence is an investigative tool linking a person to a place or another person. It is not and should never be used as the sole source of evidence to see a conviction. In the criticisms offered by scholars, they universally forget that the argument they are making is not the misuse by officers, rather the misuse by the prosecutor, which is well beyond the scope of
this research.

Recommendation – Ceasing Simulated Evidence Collection

In recommending that genetic forensic evidence collection be aligned at the officer level, it must be stated that the practice of simulated evidence collection must cease. Regardless if it is for the benefit of the victim or the reinforcement of the professionalism of the officer, faking collection, collecting and discarding, or collecting and storing evidence with no evidentiary value is unethical, wasteful, and dangerous for the agency at a liability and community perception level. As discussed within the earlier chapter considerable research has been undertaken examining agency evidence room backlogs around the nation and discovered were considerable scene sample backlogs (see. Strom & Hickman, 2010; Pratt, Gaffney, Lovrich, & Johnson, 2006; Home Office, 2005; Lovrich, et al., 2004). If nearly a quarter of officers within this research and nearly all direct investigative stakeholders interviewed were familiar with the practice, it is valid to suggest that a portion of the evidence in an agencies backlog is benign evidence with no evidentiary value. Moreover, because of the lapse in time, officer turnover, and additional factors evidence may likely see submission for processing as agencies address their backlog to find that it wastes valuable resources and perpetuates the belief that genetic forensic evidence within property crime scenes is not advantageous.

Continuing on the issue of simulated evidence collection, credibility is tantamount to a successful career in law enforcement. When called into question, the value of that officer as a witness is harmed. Potential is the situation involving an officer who collects what she believes to be benign evidence, disposes of the evidence, and does not note that evidence was collected in the report to later be confronted with statements on the stand by the homeowner that the officer
collected evidence. Such a situation, while hypothetical, would most certainly harm the credibility of the officer and call into question the forensic practices of the agency.

As introduced at the start of this research, inclusion of technology into law enforcement and the alignment of technology at the officer level are to improve confidence in the police. Simulated evidence collection undermines not only confidence in the agency but calls into question the bond between the community and the officer. Currently, civil rights groups and advocates have called into question the expanded genetic forensic programs. An issue such as simulated evidence collection only provides additional points of critique.

*Recommendation – Improved Dissemination of Training*

The following recommendation originates from the disheartening findings that nearly none of the officers were aware of the national study and subsequently the free training concerning genetic forensic evidence specific to property crime scenes. Having spent millions of dollars to investigate and evaluate the feasibility of routine genetic forensic analysis within property crime scenes, creating a training program dedicated to informing officers of the benefits, and publishing and delivering presentations across the nation, the familiarity of those aspects were nearly non-existent within the survey and interviews conducted.

There is no explanation offered that could attest to how so few officers were aware of the national report authored or the free training offered to officers. It would be easy to place the blame squarely at the feet of command staff that saw little merit in exposing officers to such training. However, none of the command staff interviewed was familiar with the training and as noted in the discussion with the Chief of Police, he wanted to know the specific location so he could send his officers to the website for training. Important in these results is not that officers were aware of the study, as the study results indicated the benefits, to which officers already are
in support of expansion. The source of this recommendation is specifically focused on disseminating training to officers.

**Research Strengths and Limitations**

As this is the first such study into officer decision-making specific to the treatment of genetic forensic evidence and the first such study to employ IPA within a mixed-method design, the strengths of this research directly reflect the research design. While the method alone is a strength because this is an original study with no prior guide, it is important to frame the study within the context of prior research and other similar study conducted is the PERF DNA study. As the survey design borrowed several elements from the PERF DNA Study, it is the opportune study to use as a source of comparison.

Concerning sample size, the PERF DNA Survey possessed a sample of 216 respondents. The present study obtained 441 respondents. The PERF Study did not provide the response rate of their survey. The uncovered rates are very much in line and as to not duplicate and compare each question, those reflecting decision making are provided here. PERF noted that 85-percent of agencies indicated that investigator discretion influenced the decision to collect DNA evidence. The present studied indicated 93-percent. The research project discovered that 62-percent of respondents specified that the determination to process forensic evidence was at the request of the prosecutor, 44-percent within the PERF study. Concerning policy treatment, 42-percent of officers in the present study indicated that they a formal written agency policy, with 32-percent of agencies noting a SOP in the PERF study. At the informal policy level, the discretionary level, there is considerable variation in that PERF detailed that 30-percent of agencies utilize an informal policy on the treatment of genetic evidence. The present study indicates that 56-percent of officers are guided by an informal policy. While this is the most divergent of findings, as all
the prior are relatively close, it should be noted that the PERF study is two years old. As discussed prior there have been considerable changes in the treatment of genetic evidence at the legislative level that likely has come to influence agency treatment and thus informal policy development.

Further strengthening the results within the study is that the sample represented officers throughout the United States. The survey did not sample a single agency or interview officers from the same agency. All respondents, across both the national survey and IPA interviews, were from different agencies and states. By not selecting a single agency as a source of the research or relying upon a single agency as a focus group, the sample was fairly representative of all officers. The geoprofile completed on the survey respondent’s shows broad representation across the nation. However, as discussed prior having no respondents from Texas or New York is not problematic but is worth noting.

Providing additional strength within this research is the inclusion of the entire stakeholder continuum as interview participants. As each stakeholder was measured within the national survey, it was important to speak to them, to use their knowledge and wealth of experience to better inform the national survey. Prior research had surveyed, or obtained anecdotal statements from lab technicians or officers, but no study to date has involved each role directly involved within the investigative process specific to the treatment of genetic forensic evidence. Without their participation, results such as the moderate to high influence of the prosecutor would have no context as to how they influence collection. Moreover, an outcome that lab philosophy is the primary inhibitor of collection would be important but would contribute little without the context provided by the forensic technicians and forensic experts interviewed. In this regard, the direct knowledge and experiences of those investigative stakeholders, those engaged in the use of this
forensic evidence is the researches greatest strength. While typically the qualitative supports the quantitative because of the depth provided by the IPA method, it could be offered that the national survey has come to support the IPA interviews.

**Limitations**

Despite the relative strengths of this dissertation, several limitations are present. Arguably, the greatest limitation within the study is the response rate. A 15-percent response rate is low and while it is comparable to other similar studies, it does present a limitation. However, recognizing that internet based survey research displays often limited response rates, the study incorporated a mixed-method design to balance what was known to be a low response rate. Regardless, the response rate is low for the study and despite the use of the IPA method, the TDM model for survey research, and the detailed analysis within the mixed-method research mode, there are issues of generalizability. An additional limitation is the use of the Southern Police Institutes database. A true national sample would prove to increase the reliability of the results.

A second limitation within the study reflects the findings within officer age. The average age of the respondents in this study was 44, which does reduce the generalizability of the study to account for the influences for “all officers.” Much of the respondents in this research were detectives or very seasoned patrol officers, which present a limitation in that younger officers, fresh from the academy may have a different outlook. This was an issue discussed at the command staff level within the IPA interviews. Moreover, the years of experience across all of the interviews were considerable, which provided tremendous depth to the research but potentially misses the younger officer perspective.
Direction of Future Research

As this research was designed to be exploratory not explanatory, the opportunity for future research is both great and needed. First, the present study details factors that influence officer decision making with a limited sample. While national in design, the research lacks the necessary response rate to offer truly reliable findings at a national scale. Future research must seek to replicate this scale at a national level, obtaining the necessary response rates to improve the confidence in the factor ranking. Moreover, it is important for researchers to replicate the study also at the individual state level to ascertain best practices and to identify how agencies have adapted to overcome those actual and perceived challenges. For example, the Law Enforcement Executive who reported the creation of an incentive program, understanding the innovations at the agency and lab level is imperative to a more routine genetic forensic practice.

Additionally, research must come to examine the labs, beyond expressing backlogs, and process mechanics to overcome such backlogs. As expressed within the interviews and the national survey, all stakeholders rely upon informal working relationships to see their evidence processed. Understanding how these relationships form and how they benefit each party is important at a practical level and theoretically allows for continued development within organizational theory.

Routine forensic processing within property crime scenes will prove costly. For this reason, it is imperative that future research examine how to reallocate current funding programs. For example, Ewing (2011) uncovered nearly half a billion dollars that states spent meeting the Sex Offender Registration and Notification Act (SORNA) requirements. This is half a billion dollars in a single year to replicate a current law enforcement database that has limited public benefit. An improved CODIS system with the capability of enhanced scene processing is likely
more beneficial than a sex offender registry. However, as no such research exists comparing the two, it is important to see research undertaken at this level. Moreover, as denoted in this research, states have come to transition costs of genetic processing to the offender level. Research must come to examine the potential disparate impact of such a policy and the potential deterrent effect of such a policy.

Future research must explore how common simulated evidence collection is within agencies and if such evidence is routinely stored. As discovered in this research, nearly a quarter of officers engaged in the practice or knew of another who had, but undiscovered were the rates in which this occurred. If this is a common practice, this could explain the astronomical number of samples untested within evidence storage rooms across the nation.

Practical research must concern itself with examining if the criminal justice system can accommodate the increase in burden that an additional ten to fifteen percent more offenders would present. Can the system support the change? As indicated in this research, there was a divergence at the prosecutor level in that there was a belief that an increase in forensic processing within property crimes scenes could facilitate a broader use of diversionary programs or simply result in more use of plea bargains. While the court will alleviate its burden, unexamined are the potential issues within corrections. At present, community corrections receives but a small portion of resources, some 10-percent of the 25-percent that corrections receives (Kleiman, 2009). As noted in the Denver study prison sentences increased significantly for those cases involving genetic evidence, with a 10-fold increase to 13.9 years compared to 1.4 years without genetic evidence (Ashikhmin, Berdine, Morrissey, & LaBerge, ND). The question to be answered is not necessarily can the police or courts adjust, but can the correctional institution adapt to the influx of offenders.
Building on the increase in offenders is the potential deterrent effect that routine genetic forensic processing can have at a general or specific deterrent level. Limited research has sought to examine the potential deterrent capability that routine processing could have within property crime scenes. Could it be said that an agency that routinely analyzes for genetic forensic evidence in every automobile theft can cause a reduction in the number of thefts as the practice become known within the illicit economy. Does word of mouth about a forensic practice influence offenders, be them juvenile or adult?

Bayley and Dixon (2010) offered that unknown is the impact that a continued focus on forensic science has within a community-oriented policing model. Originally, the intent of this dissertation was to examine this very question. Is community-oriented policing and a routine utilization of genetic forensic evidence compatible? Researchers must continue to examine the impact of policing models within the treatment of forensic evidence. As discussed within the present study, the impact of the policing model did influence the treatment of genetic evidence and if only anecdotal, it certainly fits within the theory of what is known on processes like COMPSTAT. Future research must come to explore the relationship.

Comparatively, it is important for additional research to replicate the study at an international level to understand those factors that facilitate or inhibit routine treatment of genetic forensic evidence across nations. The importance of the comparative research is to better understand the treatment of genetic evidence, as there have been increased partnerships and expansions of analysis at international levels.

**Concluding Point**

The skeptical reader is likely to reject the recommendation that agencies expand their forensic analysis into property crime scenes. After all, there are reports indicating that many
agencies have resorted to significantly reduced handling of property crime scene calls. In concluding this dissertation, I want to present three schools of thought concerning the use of technology within law enforcement. 1) Technology is modifying police practice, 2) Technology is simply a ploy in power by administrators to demonstrate "professionalism" regardless of how the technology is actually used in the agency, or 3) Technology is simply used to replicate traditional police practice and has not brought about any substantive change.

Over a decade ago, the DNA working group envisioned a system urging accountability, efficiency, and effectiveness to move forward the criminal justice system using a national identification system involving genetic forensic evidence. At present, the utilization of CODIS is myopic at best, undermine by the legislative focus to expand offender processing at the detriment of even minimal gains in scene processing. The practical reality is that agencies are facing fiscal and personnel deficits. However, agencies are currently collecting such evidence within property crimes scenes. What remains the limiting factor is the processing of the evidence, which as suggested within this research is a product of forensic laboratory policy, philosophy, and budgets. For law enforcement to become more technology centric, to align full forensic processing within an agency is to address the processing issue. I have provided specific recommendations that I believe will provide the initial steps in making the necessary transition but for technology to truly transform agencies and thus police practice, genetic forensic evidence must move beyond symbolic capital. Full forensic processing and the alignment of collection at the officer level have the capability to transform not just a single practice but to provide officers and the organization with an entirely new skillset. The tangible and intangible benefits to an organization that is technology centric, in concert with over a century of institutional knowledge is vast as is the reality that such a focus can improve the quality of a police service.
There is no discounting that the police force and treatment of forensic evidence at present is adequate, but to paraphrase and update what Kamien (1993) so eloquently stated decades earlier, we must ask ourselves if adequate is what we want in our police officers and our integration of forensic technology into the agency.
References


American Civil Liberties Union (ACLU). (2009). *Statement of the American Civil Liberties Union (ACLU) for Hearing on “Ensuring the Effective Use of DNA Evidence to Solve Rape Cases Nationwide”*. Washington: American Civil Liberties Union.


http://news.bbc.co.uk/2/hi/uk_news/8375567.stm


Cases:

Appendix A

Officer Experience and DNA Forensic Evidence Survey

Purpose:
With support from the Division of Governmental Studies and Services (DGSS) at Washington State University and the Southern Police Institute (SPI) at the University of Louisville, I am conducting a survey of law enforcement officers regarding the factors that influence their decision to process evidence recovered at property crime scenes. This survey will be used to identify the relevant factors to understand the use of DNA evidence within these investigations. As officers, your experience is a valuable asset and as such, your participation in this survey is vital to explore many of the key issues within evidence processing. The survey is relatively brief, should take no more than 10-15 minutes, and will not require any additional time commitment to gather information.

While your participation is voluntary, your valuable knowledge will greatly support a more thorough understanding of the factors that influence your decision-making and your participation will be a valuable contribution to help practitioners, policy-makers, and researchers better understand those key factors within DNA forensic evidence processing specific to property crime scenes.

Instructions:

☐ This survey is confidential. The principle researcher (David A. Makin) will collect the completed survey and no identifying information is retained (IP Address) and no agency specific information is collected.

☐ If you have already taken this survey please do not do so again.

☐ Read each of the questions and all of the answer choices carefully.

☐ A few questions request a written response. As this survey seeks your vital experience, your responses to those questions are highly valued.

☐ Should you have any question about my academic status or the purpose of the survey, you may contact my dissertation supervisor, Professor Otwin Marenin, Program in Criminal Justice, WSU, at otwin@wsu.edu; or at 509 335 8428.
Agency Information

In this section, we would like to know about DNA forensic analysis within your agency.

1. How many years has DNA forensic analysis (within any crime type) been a routine part of the investigative process within your agency?
   - Less than 2 years
   - 2 to 5 years
   - More than 5 years, but less than 10 years
   - 10 or more years

2. Thinking back over the last year, how often did your agency collect DNA evidence at property crime scenes?
   - Not at all
   - A few times during the year
   - About once a month
   - Two to three times a month
   - About once a week
   - More than once a week

3. How often is DNA evidence collected within property crime cases processed at a lab facility?
   - Almost always
   - Frequently
   - Seldom
   - Hardly Ever

4. Who in your agency is responsible for collecting DNA forensic evidence?
   - [ ] Yes  [ ] No Patrol Officers
   - [ ] Yes  [ ] No Investigators
   - [ ] Yes  [ ] No Sworn Officer: Crime Scene Technician
   - [ ] Yes  [ ] No Civilian: Crime Scene Technician

5. How would you rate the ability of those who collect DNA forensic evidence within your agency?
   - Very Good
   - Good
   - Fair
   - Poor
   - Very poor

6. How satisfied are you with the treatment of DNA forensic evidence within your agency specific to property crime cases?
   - Very Satisfied
   - Somewhat Satisfied
   - Neutral
   - Somewhat Dissatisfied
   - Very Dissatisfied

7. Which of the following statements reflects your agencies current state of DNA forensic processing within property crime scenes?
   - The agency is expanding DNA forensic analysis within this crime type.
   - The agency is reducing DNA forensic analysis within this crime type.
   - The agency is neither expanding nor reducing forensic analysis within property crime cases.

8. How do you determine when your agency will collect DNA evidence for potential analysis within property crime cases? Please mark all that apply.
   - [ ] Yes  [ ] No Agency policy (written)
Yes No Agency policy (informal)
Yes No Request or guidance from prosecutor
Yes No Investigator discretion
Yes No Don’t know
Yes No Other (please explain): __________________________

9. Does your state collect DNA samples from offenders? Please mark all that apply.
Yes No for all arrests
Yes No for all felony arrests
Yes No for certain misdemeanor and/or felony arrests
Yes No for all convictions
Yes No for all felony convictions
Yes No for certain misdemeanor and/or felony convictions

10. What obstacles does your agency face in managing cases with DNA evidence?
Yes No Conflicting philosophies within the agency regarding prioritization of cases
Yes No Conflicting philosophies between the agency and outside lab(s) regarding prioritization of cases
Yes No Differing views within the agency on the usefulness of DNA evidence
Yes No Too many evidence samples collected for cases
Yes No Inappropriate communication between forensic analysts and investigators
Yes No Not enough communication between forensic analysts and investigators
Yes No Lack of follow up by investigators after DNA results are received
Yes No Failure to withdraw DNA analysis request when case is resolved prior to analysis
Yes No Lack of interoperability between agency and forensic lab computer systems
Yes No Lack of confidence in available labs
Yes No Lack of money to pay for analyses (they are not cheap)
Yes No Don’t know
Yes No Other (please explain):

11. Are you aware of anyone in your agency or the prosecutor filing a CODIS Warrant or “John Doe” warrant within a property crime scene case?
Yes
No
I am unfamiliar with a CODIS or “John Doe” warrants.
Lab Information
In this section, we would like to know about your perspective on DNA forensics.

1. Who performs DNA analysis for your agency? Please mark one response per lab type.

<table>
<thead>
<tr>
<th>Lab Type</th>
<th>All Crime Samples</th>
<th>Violent Crime Only</th>
<th>Property Crime Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Laboratory</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Local or County Laboratory</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>State Laboratory</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Federal Laboratory</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Private Laboratory</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
</tbody>
</table>

2. How accessible or inaccessible is the lab facility that you use for testing? Consider the following in making your determination: *Can you talk to analysts directly? Will they take whatever sample you send them? Do you have to have prior arrangements negotiated with the lab before you submit samples?*

- Very accessible
- Somewhat accessible
- Neutral
- Somewhat inaccessible
- Very inaccessible

3. How would you rate the communication between the agency and the forensic laboratory?

- Very Good
- Good
- Fair
- Poor
- Very poor
Officer Perspective
In this section, we would like to know about your use and perspective of DNA forensics.

1. In what percentage of property crime cases have you requested DNA evidence be collected and processed?
   - I have not requested DNA evidence be collected and processed
   - Less than 10-percent of property crime cases
   - 10 to 25-percent of property crime cases
   - More than 25-percent, but less than 50-percent of property crime cases
   - 50-percent or more property crime cases

2. In your opinion, how effective is DNA evidence in assisting in apprehending an offender within property crime cases?
   - A great deal
   - A fair amount
   - Not very much
   - Almost none at all

3. Do you favor or oppose expanding DNA evidence collection towards property crime scenes?
   - Strongly favor
   - Somewhat favor
   - Neither favor nor oppose
   - Somewhat oppose
   - Strongly oppose

4. If funding were specifically provided to the agency to process DNA evidence within property crimes scenes, would you favor or oppose the expansion?
   - Strongly favor
   - Somewhat favor
   - Neither favor nor oppose
   - Somewhat oppose
   - Strongly oppose

5. What are the most challenging aspects of collecting evidence for DNA analysis within property cases?
   - Difficulties in identifying possible biological evidence
   - Evidence collection techniques
   - Evidence contamination
   - Evidence packaging
   - Problems with the availability of proper collection kits/tools
   - Insufficient storage space for DNA evidence
   - Need for better training for officers and investigators on DNA evidence collection techniques
   - Need for better training for officers and investigators on evidence submission and DNA analysis process
   - Crime scene contamination (i.e. the offender attempts to conceal evidence of a crime).
   - Don’t know
   - Other (please explain):________________

6. Using the list below, please indicate the level of influence that each stakeholder has within the decision to collect and process DNA evidence recovered at property crime scenes.
   - Strong
   - Moderate
   - Weak
   - None
   - Patrol Officer
   - Investigator
   - Captain
   - Police Chief

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Crime Scene Technician
Prosecutor
Victim Advocate
Victim

7. Recognizing that officers possess considerable discretion, which of the following would influence your decision to collect DNA evidence at a property crime scene?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property loss is high (&gt;$5,000)</td>
<td></td>
</tr>
<tr>
<td>Characteristics of the crime scene are similar to other cases</td>
<td></td>
</tr>
<tr>
<td>A suspect has been identified</td>
<td></td>
</tr>
<tr>
<td>Suspect has not been identified</td>
<td></td>
</tr>
<tr>
<td>Analysis requested by the prosecutor</td>
<td></td>
</tr>
<tr>
<td>Analysis requested by the victim</td>
<td></td>
</tr>
<tr>
<td>Other _____________________</td>
<td></td>
</tr>
</tbody>
</table>

8. Are you aware of anyone in your agency simulating evidence collection to appease a victim at a property crime scene call *(For example, swabbing for evidence when there is no viable sample, or collecting non-viable or benign evidence at the request of a victim because they believe it is important)*?

| Yes | No |

9. How much do you favor or oppose the recommendation that officers be responsible for evidence collection of DNA at property crime scenes?

- Very much in favor
- Somewhat in favor
- Neutral
- Somewhat oppose
- Very much oppose

10. Are you familiar with the results from the recent experiment on expanding DNA forensic analysis into property crime scenes? The report was titled “The DNA Field Experiment: Cost-Effectiveness Analysis of the Use of DNA in the Investigation of High-Volume Crime”. Published by the Urban Institute: Justice Policy Center and prepared under a grant from the National Institute of Justice.

| Yes | No |

11. Overall, how would you rate the quality of the training that you have received on DNA forensics?

- Excellent
- Very Good
- Good
- Fair
- Poor

- Did not receive training
12. Are you aware of any cases indicating that DNA evidence had been collected within a property crime scene, a violent crime could have been prevented? If so, could you provide a brief summary of the case?
General Information

In this section, we would like to know general information about yourself and your agency.

1. Which of the following best represents your agency type?
   - Municipal Police
   - Sheriffs’ Office
   - State Agency

2. Please indicate the size of your agency
   - <25 Officers
   - 25-49 Officers
   - 50-99 Officers
   - 100+ Officers

3. What is your state? _______

4. What is your present age? _______

5. How many years have you been a Patrol officer? _____; a detective? _____

6. Which of the following best describes your patrol area or community that you primarily interact with during calls for service?

   Social Class
   - Upper
   - Upper Middle
   - Middle
   - Working
   - Poor
   - Other _______

   Community Makeup
   - Primarily Caucasian
   - Largely Immigrant
   - Largely Minority
   - Diverse (A mixture of all races and ethnicities)
   - Other: _______

7. How many years have you been doing DNA collection? _______

8. Are you male or female?
   - Female
   - Male

9. Do you identify as Hispanic/Latino or Hispanic/Latina?
   - Yes
   - No
   - I do not wish to provide this information

10. What is your racial background? You may select more than one response.
American Indian or Alaska Native
Native Hawaiian or other Pacific Islander
Asian
Black or African American
White or Caucasian
Other ___________________________

I do not wish to provide this information

11. What is the highest academic degree that you have earned?

  Some school (no diploma)
  High school graduate (includes equivalence degree – GED)
  Some college (no degree)
  Vocational or Technical Certificate (for example, a nursing certificate, A+ certification, or other vocational/technical certificate programs would qualify).
  Associate’s Degree
  Bachelor’s Degree
  Master’s Degree
  Doctoral Degree
  Professional Degree (JD)