

THE IMPACT OF SURVEILLANCE TECHNOLOGY ON THE BEHAVIORS OF
MUNICIPAL POLICE DEPARTMENTS

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Citizen complaints about inappropriate use of force indicate negative police-public relations, unresponsive police services, and the unresponsiveness of police management to citizens' concerns. However, the effective delivery of key policing services depends on the performance of individual police officers. Surveillance technology can monitor and control the behavior of officers, ensuring that police officers provide high quality policing services that meet the needs of citizens. Examples of surveillance technology such as in-car cameras and CCTV can be used as an administrative tool to respond to citizen complaints by police chief executives.

This research examines the effect of surveillance technology on the behavior of municipal police departments that is operationalized as the number of citizen complaints that were filed against municipal police departments. This research also examines the impact of surveillance technology on dismissed and sustained complaints by using 511 large municipal police departments in the U.S. from Law Enforcement Management and Administrative Statistics (LEMAS) 2003 dataset. Three different models are developed to evaluate the impact of in-car cameras and CCTV on the citizen complaints and their dispositions. Two ordinary least square regression (OLS) models and a Heckman selection model are used to analyze the data. The Heckman selection model is utilized to correct for selection bias in truncated data for sustained complaints after log transformation.

The results suggest that the use of surveillance technology by the police is necessary, but insufficient, in reducing the number of complaints. The finding suggests that videotaped evidence, recorded by surveillance technology, increased the number of convictions of accused officers in municipal police departments. The analysis also suggests that municipal police departments that used CCTV only in 2003 received a higher number of citizen complaints, in comparison to municipal police departments without CCTV, both in 2000 and 2003. No evidence was found to indicate that surveillance technology has a positive impact on the percentage of dismissed complaints.

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CHAPTER 1

INTRODUCTION TO STUDY

Police departments have adapted several surveillance technologies to facilitate the tasks of investigation, fact finding, and law enforcement. These include fixed-site and mobile video surveillance, night vision/electro-optical surveillance, school safety surveillance, and police car cameras (Schwabe, Davis, & Jackson, 2001). Mobile video surveillance cameras, for example, are employed in stakeout situations or during hostage negotiations. In-car cameras are often classified as mobile video surveillance devices and are used to monitor the behavior of police officers and suspected offenders. Night vision or infrared (thermal) imagers or electro-optical image intensifiers are used for nighttime surveillance. Military, border patrol, and law enforcement agencies use these technologies to capture illegal immigrants. The fixed-site cameras are also employed for school-safety surveillance (Schwabe, Davis, & Jackson, 2001).

In the private and public sectors, according to Petersen (2001), businessmen and public administrators also use surveillance technology to monitor the behavior and activities of their employees, citizens, and customers. Employers use surveillance cameras to decrease employee theft, to protect their employees, and to monitor the people who enter and exit their facilities. Businessmen, for example, often track the movements of their employees in the workplace, in order to ensure compliance with company workplace ethics. Similarly, surveillance cameras have been used in jails and prisons to monitor the activities of prisoners, to protect correction officers and prisoners from each

other, and to protect prisoners from unnecessary use-of-force and misconduct by correction officers. In addition, some employers use surveillance cameras to determine whether their personnel that are taking sick leave really are sick (Petersen, 2001).

Surveillance technology has also been utilized in police departments. Video cameras in police cars and on street corners, for example, are two additional types of surveillance technology specifically used to monitor citizens and law enforcement officers, and to document their activities in relation to criminal incidents (Petersen, 2001). Petersen also notes that “surveillance is the keeping of watch over someone or something” (2001, pp. 1-7). Even though the main purpose of using surveillance cameras is to document the unlawful behavior of criminals so that they can be identified, apprehended, and convicted, the secondary purpose of using these cameras is to monitor the work-related behavior of law enforcement officers.

In the U.S., in-car camera systems first appeared in police cars in the early 1990s, and for the most part, are now in standard use in many law enforcement agencies (Snow, 2007). The main purpose of surveillance technology is to monitor the behavior of police officers and citizens during traffic stops and other encounters. In-car cameras, for example, are part of a system designed to enhance the accountability and discipline of officers within law enforcement agencies. In addition, the availability of digital-camera technology makes it easier to document any type of police brutality. Camera phones have become a convincing tool, in resolving the debates about crime and police conduct. Bystanders or victims can record incidents that happen to, or in front of, them using their camera phones. When the authorities are armed with video evidence, it is easier to make

informed decisions. In addition, when there is video evidence, it is also relatively easy to convince the public that police brutality is under control or has even been eliminated.

Surveillance Technology and “Inappropriate Use of Force”

It is important to examine whether the investment made by police departments in surveillance technology has a positive impact on the behavior of police officers; and whether surveillance technology programs are adopted and implemented, not merely as a symbolic gesture, but to address accountability problems and administrative responsiveness.

The adoption and implementation of surveillance technology are important and several high profile incidents have been captured by police surveillance cameras. For instance, the videotapes of these incidents played a key role in getting accurate information to the public. The Website youtube.com and the Websites of several news agencies host footage captured by police surveillance cameras. Bearing in this mind, a couple of examples are given in this section to illustrate the effect of surveillance cameras on inappropriate use of force by the police. In the first case, the footage captured by a fixed-site camera in a holding cell shows that a 15-year-old girl was beaten badly by an officer. Interestingly, the statement that the officer gave before the release of the footage did not match what the footage showed (Gutierrez, 2009). In another incident, footage recorded by an in-car camera revealed police brutality that was concealed. The footage shows that five officers beat an unconscious and unarmed suspect ruthlessly with their fists and batons after a 50-mile high-speed chase (Associated Press, 2009, May 20; Five Alabama police ..., 2009).

A recent event recorded by an in-car camera showed that an officer tasered a 72-year-old woman at a traffic stop. After the incident, but before the release of the incident's videotape in a TV interview, she claimed that the officer lied on his report because she did not argue or fight with the officer (ABCNews, 2009; Celizic, 2009). However, the video footage refuted her statement and the video evidence clearly shows that she resisted arrest and was uncooperative with the arresting officer. The incident shows that citizens can also lie about what really occurred during an encounter, and that videotaping can exonerate police officers from false complaints.

There are several reasons for the introduction and adoption of surveillance technology by police departments. One reason is that the "use of force" policies designed by law enforcement agencies are inadequate to guide the behavior of officers, because it is impossible to provide guidance on when and how much force should be used in all possible types of incidents. In addition, the appropriateness of use-of-force by the police is often ambiguous. Among public personnel, only law enforcement employees are authorized to use force while performing their duties. Although the use-of-force is a controversial and sensitive issue, the extent to which force is used by police officers varies in intensity from a verbal warning to deadly force. An appropriate use of force, for example, is to incapacitate a resistant offender without causing injury. Unfortunately, such force may be utilized inappropriately and unnecessarily given the circumstances, suggesting the need for surveillance technology to ensure compliance.

Despite the difficulty of identifying when and how police officers should use their discretion during an arrest, scholars have attempted to define the terms. Pate & Fridell

(1993, p. 19), for example, define the use of excessive force as “police use of more force than is necessary in seizing or detaining an individual.” To some extent, the term excessive force is synonymous with unnecessary or inappropriate force. The use of a greater amount of force than usual may be required to take a suspect that is resisting arrest into custody. Given the ambiguity of the terms, in the current study, the term inappropriate force is used instead of excessive force, because the goal of this research is to discover whether the presence of surveillance technology discourages officers from using inappropriate force. The term “use of force” refers to the use of physical force.

For the most part, police agencies adopt policies or operational procedures to remove ambiguity from actions, in order to effectively control their officers’ behaviors, and they rely on surveillance technology to ensure compliance. It must be emphasized that the goal of the use-of-force policies is not to eliminate the use of discretion. However, the use-of-force policies often fail to clearly guide officers as to what constitutes a reasonable use-of-force (Walker, 2005). For example, the use-of-force policies, written by law enforcement agencies, outline the conditions under which police officers can use force. The International Association of Chiefs of Police (IACP) National Law Enforcement Policy Center (2001b) has issued a model policy regarding the exercise of force. The model policy specifies that law enforcement officers can use force to control an incident and to protect their lives and those of other potential victims. It identifies the conditions under which officers may employ non-deadly and department-approved force techniques and equipment, to protect an officer or others from injury, and to bring a resistant individual and an unlawful incident under control (IACP National

Law Enforcement Policy Center, 2001b). Only surveillance technology can demonstrate the extent to which police behavior is not in violation of this definition.

However, even though model policy emphasizes that the determination of when the use-of-force is appropriate cannot be left solely to an officer's discretion, there is no fail-safe guide on how and when force should be utilized, suggesting that surveillance technology is important in ensuring policy compliance. The only criterion stated in the policy is that the use-of-force must be 'objectively reasonable.' The model policy gives the definition of 'objectively reasonable' as:

In determining the necessity for force and the appropriate level of force, officers shall evaluate each situation in light of the known circumstances, including, but not limited to, the seriousness of the crime, the level of threat or resistance presented by the subject, and the level to the community (IACP National Law Enforcement Policy Center, 2001b, p. 1).

Adding to the difficulty of monitoring the behavior of police officers and their department, is the vague definition of "unnecessary" or "inappropriate" or "excessive force." These terms are often ambiguous; hence, it is difficult to gauge the extent of police brutality (Barker, 1978; Walker, 1989). Laws, regulations, and departmental policies authorize police officers to use force "in case of need," in arresting a suspect or preventing an escape. However, it is difficult to determine what level of force must be utilized "in case of need" (Langworthy & Travis, 1994). The Rodney King incident in Los Angeles, in 1991, is a good example of the ambiguous definition of police brutality. Even though the incident was clearly a case of police brutality and a civil rights violation, the jury accepted the argument that "the officers needed to use force to achieve the arrest

of Mr. King” and the jury found all officers innocent, except for one (Langworthy & Travis, 1994).

It is also difficult to decide what type of force must be used “in case of need,” suggesting that police work is inherently problematic. Force may be considered a continuum that ranges from a verbal warning to the taking of a suspect’s life. There are many alternatives along this continuum, such as restraint, pushing, shoving, punching, kicking, chemical mace, tasers, stun guns, batons, plastic bullets, and firearms. It is often unclear as to how an officer arrives at a decision to kick, rather than using teargas, or using a taser, rather than firearm (Langworthy & Travis, 1994).

Surveillance technology is important for police agencies, because the majority of police tasks are not performed under the control of a supervisor. Patrol officers spend most of their time away from their departments, unless they are returning to bring in a suspect to the department’s jail or to fill out the paperwork on a criminal case (International Association of Chiefs of Police, 2005). Police officers operate, for the most part, away from the direct control of their hierarchical supervisors. Thus, it is not surprising that law enforcement organizations spend considerable amounts of money on surveillance cameras to maintain accountability, by documenting the activities of their officers. In the process of documenting these activities, police administrators are able to control their officers in the field, where they conduct police work in low visibility areas, away from managerial and public scrutiny.

Another advantage of the adoption of surveillance technology is to ensure that police officers use their discretionary powers appropriately. For example, in addition to

being hidden from supervisory control, the highly discretionary nature of police work may become problematic, if not monitored, possibly leading to inherent societal conflicts (Dierickx, 2008). Police officers have considerable discretionary powers. As pointed out by scholars in the field, the control of police discretionary powers by police administrators is important, in order to prevent misconduct and abuse of power by policemen and, in particular, police brutality. Langworthy & Travis (1994, p. 343) describe police discretionary powers as:

The fact is that police officers have wide powers of discretion that are seldom controlled by supervisors, statutes, or departmental regulations. The ability of police to use their authority appropriately in a variety of ways allows them to misuse it in similar ways as well.

Lipsky (1980) argues that policy implementation, in the end, comes down to the employees who actually execute it. When public policies are translated into practice, they are implemented by street-level bureaucrats such as teachers, police officers, and social workers. Street-level bureaucrats significantly influence the implementation of public policies. Hence, police officers' large powers of discretion must be controlled by using surveillance technology, in order to successfully implement criminal justice policies.

It is not clear, however, whether the introduction of surveillance technology will reduce the number of public complaints. In 2002, for example, public complaints about the abuse of power by police officers were significant. Large state and local law enforcement agencies (i.e., those employing 100 or more sworn officers), employing 59% of the U.S.'s sworn officers, received 26,556 citizen complaints about the inappropriate use-of-force. Out of a total of 26,556 complaints, 22,238 (i.e., 84%) were reported by large, municipal police departments. Those complaints were classified as follows: 8%

were sustained, 37% were not sustained, 25% were unfounded, and 21% were exonerated (Hickman, 2006). Because of the aforementioned problems, police administrators are highly motivated to protect the reputation of their agencies and their professional careers. Police administrators “are motivated to control and limit police officer misconduct and to develop mechanisms within their agencies to direct officer behavior” (Langworthy & Travis, 1994, p. 357).

One of the mechanisms within the police agency that is used to direct officers’ behavior is the introduction of surveillance cameras and, in particular, in-car police cameras. In-car cameras are increasingly being used by municipal police departments for the purpose of directing officers’ behavior. As such, in-car cameras are expected to decrease some problems in policing, such as the inappropriate use of force, by closely monitoring the behavior of police officers while interacting with citizens. The introduction of closed-circuit television (CCTV) is an equally important method.

This study focuses on the use of in-car cameras and CCTV. It examines the effect of these cameras on the behavior of municipal police departments. Specifically, the goal of this study is to test the impact of in-car and CCTV cameras on citizen complaints about the inappropriate use of force.

Research Questions

This dissertation explores the impact of surveillance cameras on the behavior of municipal police departments. Using variables adapted from the relevant literature, the following questions are formulated:

1. Does the use of in-car and CCTV cameras reduce the incidence of citizen complaints of inappropriate use-of-force by municipal police departments in the United States?
2. Does the use of in-car and CCTV cameras affect the incidence of dismissed cases of inappropriate use of force?
3. Does the use of in-car and CCTV cameras affect the incidence of sustained cases of inappropriate use of force?
4. Does the experience of municipal police departments with the usage of in-car cameras and CCTV have an impact on the number of citizen complaints?
5. Does the experience of municipal police departments with the usage of in-car cameras and CCTV have an impact on the percentage of dismissed complaints?
6. Does the experience of municipal police departments with the usage of in-car cameras and CCTV have an impact on the percentage of sustained complaints?

These questions are important to the theory and practice of public administration.

In terms of responsiveness, the effective delivery of key policing services depends on the performance of individual police officers and their departmental policies. Surveillance technology conditions police officers to perform their administrative duties and uphold the law in a prescribed manner. Furthermore, surveillance technology can monitor and control the behavior of officers, ensuring that they produce high quality policing services that meet the needs of citizens.

In terms of administrative accountability, consistent with the tradition of public administration, public employees are accountable to their supervisors in a hierarchical

organization. From the supervisors' point of view, supervisors oversee the performance of their officers by the use of various tools. For example, in a democratic society, it is necessary to ensure that police personnel use their power and resources to uphold the rule of law, within approved restrictions. From an administrative perspective, surveillance technology can offer an explanation of the reasoning behind the actions of officers that are under suspicion of violating departmental policies. When an officer receives a complaint from a citizen, because of his/her disputed action, the officer can use the videotape recorded by surveillance technology to explain the reason for his/her disputed action (Chan, 1999; McLaughlin, 2005; Newham, 2005; Petersen, 2001).

In short, the answers to these research questions can be expected to contribute to the literature on accountability in public administration, to contribute to the literature on police brutality, and to fill the gap in knowledge regarding upholding police responsiveness via surveillance technology.

Conceptual Framework

The conceptual framework of this research is based on the principal-agent theory. In this research, the principal agent theory is used to predict the behaviors of municipal police departments. In addition, the routine activity theory is used to predict the behavior of a suspect or a citizen rather than the police officers. Even though the routine activity theory predicts the appropriate behavior of a citizen or a suspect, police officers must also act appropriately all the time regardless of how suspects or citizens act during an encounter with a police officer.

In terms of the behavior of a law enforcement officer, he/she tends to act differently from the expectations of his/her police administrator, if he/she finds an opportunity. While the expectation of a police administrator is that the officer will use appropriate force, an officer may use inappropriate force in the absence of a monitoring mechanism. When surveillance cameras are present, it is expected that police officers will stay within their legal boundaries of behavior during an encounter without displaying inappropriate behavior. Surveillance technology may improve the organizational behavior of officers so that they comply with the policies of their organizations. Surveillance technology may also improve an officer's performance because videotapes containing officers' work-related behavior are used for evaluating their job performance, annually or biannually.

A linkage between the Hawthorne experiments and the principal agent theory can be built in terms of monitoring employee behavior. The Hawthorne experiments provided an early theoretical basis for the notion that observing employees can alter their behavior. While the Hawthorne experiment used a researcher-observer approach, a surveillance camera performs a similar function to that of the researcher as observer. A police chief executive as the principal monitors the behavior of his/her police officers (his/her agents) via surveillance technology to ensure their compliance with the policies of police departments. It is anticipated that surveillance technology alter the behavior of police officers.

The Hawthorne studies were led by Mayo and Roethlisberger and started in 1927. They studied worker productivity. In their experimental studies, the researchers found

that people alter their behavior when they are aware of being observed. This finding is named the Hawthorne effect (Denhardt, Denhardt, & Aristigueta, 2002; Roethlisberger, 1941). It is expected that in-car or CCTV cameras change the behavior of police officers toward more compliance with the rules, regulations, and particularly departmental policies such as use of force policy.

The incident of force is less likely to occur if a suspect or a citizen acts appropriately during an encounter with the police. Surveillance technology may encourage more appropriate behavior by a suspect during an encounter. According to the routine activity theory, an interfering force--defined as a risk and the presence of surveillance cameras--represents the existence of a risk. The risk can be defined as getting punished when detected. In addition, according to the theory, there are two parties to an encounter in police activities: the law enforcement officer and the citizen or suspect. The main assumption is that a potential suspect acts opportunistically to victimize the other party. The use of surveillance technology decreases the number of these opportunities and increases the costs incurred by inappropriate behavior. Surveillance technology may also reduce uncertainty during encounters. It defines the boundary of appropriate behavior, especially when a suspect is making a decision whether to cooperate or not, i.e., resisting arrests or being abusive to police officers. In this sense, surveillance technology may encourage a suspect to act more cooperatively.

An alternative explanation predicts that surveillance technology may not have a significant impact on either the behavior of the citizens or arresting officers. For instance, if the individuals do not perceive the cameras to be an interfering force, surveillance

technology will not prevent them from committing crimes, resisting arrests, or being abusive to police officers. If the arrested individuals believe that they will be punished, it is also possible that the offenders would file official complaints in order to recover money from police agencies. An offender may deliberately hope that the charges will be reduced, by filing an intentional complaint (Snow, 2007). The effect of surveillance technology on the number of citizen complaints may be high because of the strategic or opportunistic behaviors of offenders. At the same time, citizens or suspects may not file official complaints, if they believe that police officers will not be punished, even though a videotape containing the illegal behavior of the accused officer exists.

From a police officer perspective, the presence of surveillance technology may not have a significant impact on their behaviors, because officers may believe that their supervisors will protect them and that they will not be punished, even though the videotaped evidence exists. Furthermore, an officer may not believe that he/she will be convicted, because his/her fellow officers that were previously accused of using excessive force were found innocent, even though the incident of inappropriate use of force was videotaped. Moreover, officers may also believe that juries will most probably find the accused officers innocent, because juries will most likely accept the argument that the officers acted appropriately, as they were trained to do. In addition, officers may believe that citizens will not file complaints against the police, because they are afraid of the police, even though a videotape containing evidence of inappropriate behavior exists.

Significance of the Study

This study adds to the existing literature by examining the relationship between surveillance cameras (e.g., in-car cameras and CCTV) that are used by municipal police departments in the U.S. and citizen complaints about the inappropriate use of force. This quantitative study is the first empirical study, to my knowledge, to examine the impact of in-car and fixed-site cameras on citizen complaints about the inappropriate use of excessive force and the disposition of these complaints, at the organizational level. This research proposes that surveillance technology may improve the organizational behavior of police officers, because police organizations can enforce the law in punishing the inappropriate behaviors of police officers, if they are recorded by surveillance technology. In addition, surveillance technology can influence the balance of power to benefit citizens, because videotaped evidence may increase citizens' confidence and trust in law enforcement agencies.

Organization of the Following Chapters

Chapter 2 presents a review of the literature relevant to the current study and provides a background for the research. The goal of this chapter is to examine the logical relationship between surveillance technology and its effects on the behavior of law enforcement officers and, thus, the police department. Furthermore, relevant case studies are included to draw attention to both the problem and solutions to police abuse of power. The relevant research literature is included to identify the variables to be used in this study and to maintain consistency with previous research.

Chapter 3 describes the methodology of the research used in this study. Since the current research uses an empirical quantitative approach, the operationalization of variables is, also, introduced in this chapter. The research hypotheses are developed to further explain the current focus of the research. This chapter describes the Law Enforcement Management and Administrative Statistics (LEMAS) 2003 dataset, which was created from a survey that gathered data nationally, from a representative sample of state and local law enforcement agencies. The LEMAS 2003 dataset contains information related to a large number of municipal law enforcement agencies in the U.S. The main purpose of this chapter is to explain why data from municipal police departments that employed 100 or more sworn officers, in LEMAS 2003 dataset, were used.

Chapter 4 examines the accuracy of data entry and the problems of missing data, skewness, and kurtosis. The minimum and maximum values, means, and standard deviations of each of the variables are also examined for plausibility. After discussing the problem of selection bias due to missing cases, the topic of transformation of variables to correct for the normality assumption is introduced. This chapter also evaluates the distribution and frequencies of each dependent and independent variable, the reasons for introducing the Heckman selection model, and the need to treat surveillance technology as a dummy variable.

Chapter 5 presents the empirical results. The main findings suggest that surveillance technology has an impact on both the number of citizen complaints about excessive force and the disposition of these complaints against municipal police departments. The nine regression models, presented in three tables, display the statistical

evidence regarding the impact of surveillance technology on force complaints and their dispositions. This statistical evidence is, then, interpreted and discussed. The usage of surveillance technology and the amount of experience a police department has in using surveillance technology are explained and interpreted separately. The main research finding suggests that videotaped evidence, recorded by surveillance technology, increased the number of convictions of accused officers in municipal police departments.

Chapter 6 presents a conclusion of the research, highlighting the main contributions to the theory, practice, and methodology in the field of public administration and the limitations of the research, and recommendations for future studies. Policy recommendations were also made based on the research findings.

CHAPTER 2

LITERATURE REVIEW

Introduction

Police patrol officers usually have significant amounts of discretionary powers without much constraint, because the nature of their work requires them to perform their duties in places away from direct monitoring by their supervisors (Dierickx, 2008). Although police work occurs mostly in public places, direct monitoring of officers' behavior in the field is limited. Because of this limited supervision and the discretionary powers that officers have in carrying out their duties, police personnel can, potentially, abuse their authority.

Linn (2007) argues that citizens pressure public administrators to video monitor police activities because of a history of police misconduct and insufficient administrative control over police personnel. Public concern over high-speed pursuits, racial profiling, and other questionable police practices have motivated officials to install in-car cameras (Linn, 2007). The in-car camera provides an unbiased and impartial witness to critical incidents, to the integrity of law enforcement personnel, and to promote the accountability in a law enforcement agency (International Association of Chiefs of Police (IACP), 2005).

As indicated above, the two most important characteristics of police work are discretion and low visibility. In order to reduce the abuse of power by police, officers must be monitored in order to ensure that their behavior complies with departmental

policies. This chapter discusses the use of surveillance technology in policing, the role of this technology as a control mechanism, and, then, undertakes a comprehensive review of the literature on surveillance technology in policing and its effects on the behavior of officers and citizens. In addition, it includes a discussion of the existing research literature that predicts inappropriate use of force at the organizational level is included.

The Importance of Surveillance Technology in Law Enforcement

Video cameras used in policing are mostly found in patrol cars in state and local law enforcement departments throughout the U.S. (Schwabe, Davis, & Jackson, 2001). Surveillance technology documents the activities and behavior of suspects, citizens, and offenders in regard to criminal incidents. Departmental policies specify when officers must initiate recording by their in-car cameras (Kuboviak, 2004b). The discretion used by officers in activating the system can be an indicator of its role in collecting evidence.

In the International Association of Chiefs of Police's study, (2005), troopers from 20 states were asked to explain what they believed the purpose of in-car camera installations to be. Officers gave as the first reason collecting evidence for court cases and for exonerating accused officers; the second reason they gave was to monitor officer performance (28%); the third reason they gave was to collect evidence for internal affair investigations and for protecting officers against racial profiling. In short, it is clear that surveillance technology is used for accountability and collecting evidence in regard to criminal incidents. In fact, surveillance technology is important in policing for, mainly, these two reasons.

According to Walker & Katz (2005), police departments use in-car cameras primarily for accountability reasons. The authors note that in-car cameras document the behavior of citizens and police officers when they interact. The authors point out that a videotape can answer questions regarding controversial incidents, such as whether an officer employed inappropriate force. For instance, a citizen may be certain in his/her own mind that a police officer used inappropriate force, but a videotape may show that the officer, in fact, used a legitimate level of force.

In another study that draws attention to the various benefits of in-car cameras, Maghan, O'Reilly, & Shon (2002) concluded that in-car cameras deter police abuse of power, reduce false complaints against officers, provide evidence when a suspect attacks officers, and control officer behavior to promote fairness while dealing with suspects, while encouraging them to treat suspects humanely and to respect human rights and liberties.

Kuboviak (2004b) states that racial profiling and police integrity can be considered to be a secondary purpose for using this surveillance technology. Schwabe, Davis, & Jackson (2001) point out that video-recorded evidence can be used as credible evidence for/against police personnel in regard to their abusive behavior. Do, Schmitt, Styles, Wang, Wincek, & Zeddies (2005) argue that surveillance cameras act as a deterrent on officers against corruption and other forms of police misconduct. Surveillance technology has the potential to prevent police misconduct. Furthermore, surveillance technology can prevent problematic behavior of officers in the workplace and can increase officers' performance levels. Ulkemen (2009) states that law

enforcement agencies in developing countries may solve some of their police misconduct problems by adopting particularly in-car camera program.

Surveillance technology can deter and document police abuses of power, and, it can provide impartial evidence of police practices when even officers are accused of unconstitutional or unprofessional conduct. Technology makes police-citizen encounters more predictable and, potentially, less violent. Because of surveillance technology, reviews of police use of force are made more effective, acceptable, and impartial (Schwabe, Davis, & Jackson, 2001).

According to Sechrest, Liquori, & Perry (1990) in-car cameras are used to make patrol work safer, to catch suspects doing things that are hidden from officers, and to provide recorded evidence against alleged wrongful searches and mistreatment by officers.

The International Association of Chiefs of Police (IACP) National Law Enforcement Policy Center (1992) identifies these policy objectives of using in-car video cameras:

(1) accurate documentation of events, actions, conditions and statements made during arrests and critical incidents, so as to enhance officer reports, collection of evidence and testimony in court; and (2) the enhancement of this agency's ability to review probable cause for arrest, arrest procedures, officer and suspect interaction, and evidence for investigative purposes, as well as for officer evaluation and training (p.1).

These statements suggest that in-car video cameras can, potentially, influence the behavior of police officers and elevate the level of accountability in the exercise of their official duties (Ulkemen, 2009).

According to Linn (2007), police administrators find in-car cameras useful in resolving citizen complaints, in enhancing and evaluating personnel performance, and in diminishing expensive lawsuits against police agencies. In addition, police administrators employ the video recordings to evaluate officer conduct, when they have been accused of abuse of power (Linn, 2007).

Surveillance technology may prevent sexual harassment and discrimination within the workplace. Surveillance cameras can be used to monitor officer behavior and to protect against sexual harassment or discrimination in the work place. Do et al. (2005) argue that although sexual harassment and discrimination cases are difficult to investigate, videotapes of surveillance cameras in public places, in police cars, and police stations help investigators understand what really happened. They also note that surveillance cameras serve as a deterrent to potential harassers by monitoring and recording officer behavior.

Surveillance technology may, also, prevent racial profiling by the police. Racial profiling exists when police officers discriminate against citizens from different races and ethnicities in terms of the relative frequency for stopping drivers of vehicles. Police in-car cameras can control officers in the field by monitoring their behavior (Dierickx, 2008).

The use of in-car police video cameras has been proven to decrease response times to crimes (Petersen, 2001). Police departments in the U.S. release their average response times, annually. Keeping a record of each response time for police patrols is, already, a control mechanism that forces officers to arrive at a crime scene as soon as possible. In-car cameras supplement response time records and result in an increase in

response time of patrol units, in comparison to the police patrols that do not use in-car cameras.

The main purpose of using surveillance technology is to deter crime and to document evidence of criminal acts. Proponents of surveillance technology in policing claim that police surveillance prevents crime through deterrence. Surveillance cameras remind potential criminals that their behavior and activities are being observed. In addition, surveillance technology provides the police with more valuable and accurate information than witness statements (Schwabe, Davis, & Jackson, 2001). For instance, in-car monitoring helps dissuade restrained persons being transferred to jail from attacking police officers and encourages them to be more cooperative during the encounter.

Kuboviak (2004b) notes that the main purpose of using in-car cameras is to gather evidence. In addition, Schwabe, Davis, & Jackson (2001) point out that video-recorded evidence can be used as credible evidence against criminals. It was found that criminal acts captured on videotapes by in-car cameras increase the confession rate of suspects (Petersen, 2001). When suspects are aware that their actions are being videotaped, they tell the truth. The videotapes accelerate convictions and prosecutions.

In-car cameras can resolve intentional false allegations of police wrongdoing. Individuals arrested by law enforcement officers may intentionally file false complaints against officers for several reasons. Revenge can be counted as the first reason. If an officer ignores their illegal activities, offenders will not have to serve time in jail or pay a fine. In other words, suspects see law enforcement officers as the reason for their incarceration. The second reason is that suspects hope that the charges against them will

be reduced by filing a false complaint. Third, false complaints are made to recover money from police agencies (Snow, 2007). In all these situations, videotapes captured by in-car cameras can show whether the conduct of police officers was appropriate or not. These videotapes help officers to prove their innocence with the potential for exonerations falsely accused officer.

Controlling the Behavior of Law Enforcement Officers and Police Accountability

Stone & Ward (2000) sum up the role of police officers well: “Police who patrol and respond to calls are the most visible representatives of a government to its people” (p.16). This means that the police represent their government at the street level, while they are enforcing the law. Citizens who do not trust their police organizations, in effect, do not trust their government. Police agencies, like other public organizations, are created by the government to perform certain duties and tasks within a framework of procedures, while, at the same time, completing their enforcement actions in a prescribed manner.

One goal of law enforcement is to increase the people’s trust of the police force via various tools. At the same time, the police must also increase the people’s trust of the government in order to encourage citizens to comply with the law. Police personnel must be held accountable for their behavior in order to increase citizens’ trust in the criminal justice system. If individual police officers do not follow the law, citizens cannot be expected to follow it either. Hence, the behavior of police officers must be controlled, to prevent a loss of faith in the officers on the streets.

Some public organizations, such as law enforcement agencies, videotape their employees’ activities routinely, because of the importance of accountability issues

(Petersen, 2001). In the context of policing, accountability has two meanings. First, accountability means controlling the behavior of the police when they are performing their official duties. Second, accountability means that explanations about police conduct are provided (Brogden, Jefferson & Walklate, 1988; Lustgarten, 1986; Stenning, 1995 in Chan, 1999).

In terms of the first meaning of accountability, the control model relates to establishing monitoring mechanisms in order to increase the compliance with law and order. Holding police officers accountable requires control mechanisms, such as performance evaluations or their performance being monitored by their supervisors. Each officer's performance is evaluated biannually or once a year, on a regular basis. In terms of the second meaning of accountability, officers are required to explain the reasoning behind their decisions (Chan, 1999). When officers receive a citizen complaint or have lawsuits filed against them, the officers must explain the reason(s) for taking the disputed action. In addition, police officers document their actions by filing reports and testifying in administrative and court hearings.

A control mechanism may become internalized into the procedures of an organization. Internal accountability helps administrators ensure compliance with the goals and mission of the organization. The aim of the control mechanism is to ensure and enforce compliance (Gortner, Nichols, & Ball, 2007). Accountability makes public administrators personally liable for their official actions. Moreover, accountability forces officials to execute the law, as intended (Rosen, 1998).

McLaughlin (2005) states that police accountability is established through the mechanisms of the rule of law and good governance. There are two goals of police accountability. The first is to ensure the quality of community safety, justice, and security services. The second goal is for police officers to explain their treatment of individual citizens, particularly in terms of civil liberties and human rights. In addition, McLaughlin (2005) emphasizes the close connection between organizational and officer-level accountability. According to him, effective delivery of key policing services depends on the performance of individual police officers. In particular, the way in which they work in the neighborhoods and streets and how they use their discretionary powers and authority are the indicators of an effective delivery of core policing services (McLaughlin, 2005). These statements emphasize the importance of internal control mechanisms in determining officer conduct.

It is necessary to guarantee that the police employ their power and resources to uphold the rule of law, within approved restrictions. The police must guarantee the public that they are using their power to protect citizens while, at the same time, upholding citizens' rights. In order to realize this goal, a control mechanism must be created to ensure that police autonomy is controlled, but without completely tying the hands of the police (Newham, 2005). In-car cameras can be one of the control mechanisms used to ensure that the police are accountable and do not abuse their power and resources.

The Use of Surveillance Technology in Policing

Closed-Circuit Television (CCTV)

Closed-circuit television (CCTV) can be defined as “noncommercial video recordings that are broadcast on a private network” (Foster, 2005, p. 321). Videotape technology was first created in the 1960s (Foster, 2005). The use of video surveillance technology grew in the 1980s with closed-circuit television (CCTV). CCTV became a standard tool for public and private organizations in the early 1990s (Petersen, 2001, 8-38; Linn, 2007).

CCTV was used before the invention of in-car cameras. Traffic enforcement and in-car cameras are a type of CCTV application. The major use of CCTV has been to monitor public places (Foster, 2005). Fixed-site surveillance cameras include CCTV cameras and are used to monitor parks, intersections, and city streets. It has been used in many of the bigger cities throughout the world. For instance, there are more than 250,000 cameras in use throughout the United Kingdom (Schwabe, Davis, & Jackson, 2001).

Some people argue that fixed-site cameras only displace crime (Petersen, 2001), because of the potential risk that an offender will more likely be identified and convicted (Foster, 2005). The presence of CCTV cameras can deter people from committing crime and they can, also, deter police officers from committing misconduct or abuse of power. Even though the police are not among the intentional targets of a CCTV system, they are routinely videotaped by the system (Norris & Armstrong, 1999). Skinns (1997) found that ‘watching officers’ is evaluated as one of the disadvantages of CCTV by almost 25%

of officers that were interviewed (Norris & Armstrong, 1999). In other words, one fourth of the respondents indicated that they did not like being watched by CCTV cameras.

It can be expected that officers are less likely to use inappropriate force in the presence of CCTV cameras and that the increasing number of CCTV cameras is related to the decreasing number of citizen complaints about police misconduct. In addition, the increasing number of CCTV cameras may be associated with an increase in the exoneration of citizen complaints about police misconduct because CCTV tapes will show that officers acted properly.

Video Cameras in Police Cars

The use of video cameras in patrol cars has been common, for many years, in many American and Canadian law enforcement agencies. Video cameras are mounted in police patrol cars and used by police officers during traffic stops and while responding to emergency calls. The first attempt to use video cameras in patrol cars was in the 1960s, by the Connecticut State Police (IACP National Law Enforcement Policy Center, 1993). This equipment became smaller over the years and many police agencies started to use it, between the late 1980s and early 1990s (IACP National Law Enforcement Policy Center, 1993). In-car cameras (mobile video systems [MVSs] in patrol cars) were an adaptation of CCTV surveillance and were introduced nationwide in the mid-1980s (Linn, 2007).

Starting in 2000, federal grants were disbursed to buy and install in-car cameras. The U.S. Department of Justice's Office of Community Oriented Policing Services (COPS) established the In-Car Camera Incentive Program and provided federal awards to state police and highway patrol agencies to fight against the allegations of racial profiling

and other citizen complaints. Between 2000 and 2003, the COPS program gave more than 21 million dollars to 47 states and to the District of Columbia to purchase in-car cameras (IACP, 2005; Westphal, 2004).

According to a 2003 survey by the Law Enforcement Management and Administrative Statistics (LEMAS) by the Bureau of Justice Statistics, 55% of the local police departments in the U.S. used video cameras in their patrol cars (about 48,800 cameras), and their use has steadily increased since 2000 (Hickman & Reaves, 2006). According to this survey, between 2001 and 2003, the following percentages of police departments began using video cameras in their patrol cars: in communities of 250,000 or more, 20%; in communities of 50,000 to 249,000, 15%; in communities of 10,000 to 49,999, 12% ; and in communities of less than 10,000, 13% (Hickman & Reaves, 2006).

How Video Cameras in Patrol Cars Work

Whenever a police patrol officer stops a vehicle for an observed violation of a traffic law, the officer turns his/her car's emergency lights on. Typically, in-car cameras are activated whenever the emergency lights or siren are activated; however, the activation of in-car cameras varies (Maghan, O'Reilly, & Shon, 2002). In-car cameras are also activated by the officer manually pushing the record button on the control panel in the patrol car or by pushing the record button of a wireless transmitter on the officer's belt (IACP, 2005). In other words, they are activated either at the officer's discretion or with the emergency lights or siren (Foster, 2005).

The goal of an officer is to place a suspect in front of the video camera (Foster, 2005). Whenever a police officer stops a pedestrian or a motorist, the officer will try to

move all parties to the front of the patrol car, because this position provides the best view for video recording. The camera captures all the interaction within the camera's field of vision, including the verbal and nonverbal communications, between the officer and the other party.

Each patrol officer carries a wireless remote microphone attached to his or her uniform. This system allows officers to remotely record conversations via the wireless microphone, which is sent to a receiver in the police car. The system picks up sound from the wireless remote microphone from an area within 1,000 feet of the patrol car. When an officer is away from the patrol car, in a building or in a house for policing-related work, the officer activates the system via a wireless transmitter to record any conversations (Christopher Commission, 1991; Ardila, 2005; IACP, 2005).

Many police departments in the U.S. still use a VHS (Video Home System) recording system, although it is an older technology. Newer systems employ DVD (Digital Video Disk) technology. DVD-RAM discs store over eight hours of video recordings, and they can be stored and managed the same way as VHS tapes (Kustom Signals, 2007b).

In addition, in-car cameras have a pre-event recording feature. This feature helps officers to record unexpected criminal incidents that they may encounter. While officers are activating in-car cameras, they may lose sight of such criminal acts or behavior. Pre-event recording allows officers to automatically capture thirty seconds to three minutes of video before activating the camera. For instance, if an officer witnesses a vehicle running a red light before turning on the camera, the video system captures and records the

incident automatically. This concrete evidence can help verify the events that took place (Kustom Signals, 2007b). On the other hand, Kuboviak (2004a) argued that the pre-event record function can violate the privacy of police officers by recording everything that a police officer says, does, and how he/she drives, before the activation of the cameras. Those recordings may not be related to the criminal prosecution, but all the tapes may have to be submitted to the authorities. However, this problem can be solved by reducing the time of pre-event recording without audio (Kuboviak, 2004a).

Also, the newest models of in-car videos can record to a removable hard drive (HDD) that is similar to the external hard drive used with computers. The HDD option with 40 GB of storage can record up to 90 hours of real-time video. Two removable hard drives are used. When one drive is full, it can be removed and turned in or downloaded, while the other drive is in continuous use in the vehicle. The recorder is in the police car's cab or trunk (Kustom Signals, 2007a; 2007b).

The utility of in-car video cameras is evident. The use of the device is simple, and it is designed so that it will not interfere with police duties. The International Association of Chiefs of Police (IACP) policy describes how it works: "the wireless microphone is activated in order to provide narration with the video recording to explain the reason for officers current or planned enforcement action" (IACP National Law Enforcement Policy Center, 1992, p.2).

The Rodney King Incident and the Christopher Commission Report

Police departments that employ in-car cameras have policies for the use of mobile video systems. Policy papers regarding the use of in-car cameras include the police

department's policies on the purpose, definition, tape issuance, and circumstances required to use in-car cameras. When one looks at a police department's policy paper, the purpose of using in-car cameras can be clearly understood. For instance, the general order of mobile video procedures of the Denton Police Department (Texas) explains the purpose of using in-car video cameras as protecting the department, its officers, and the citizens, while police officers are in contact with citizens under adverse conditions (Denton Police Department, 2001). This department's general order also forces officers to record everything, when possible, during citizen and police officer interactions (Denton Police Department, 2001). This department's general order does not directly mention to control officers' behavior by using in-car video cameras, but one explanation for this is that cameras control officers and protect citizens from police abuse of power via this surveillance system.

In 1991, Rodney King, an African-American man, was the victim of police use of unnecessary force. This pivotal event in police accountability changed American's perception of police behavior, because the event was captured by an observer using a video camera¹. While he was speeding on the night of March 02, 1991, Mr. King was chased by the California Highway Patrol into Los Angeles. After a high-speed pursuit, he was pulled over by the patrol officers and badly beaten. This beating was videotaped by a citizen from his nearby apartment and broadcasted by the news agencies around the world. Several officers were involved in the beating, four were charged with the use of inappropriate force, but only one of them was convicted (Cannon, 1999). The Rodney

¹ Rodney King incident can be watched on www.youtube.com (Shanahhen, 2007).

King incident was important to police agencies for two reasons: The incident was videotaped, and the police officers were white and the victim was black.

In U.S. history, the Rodney King incident was important because it reinforced the Black community's perception of the police officers. Several riots occurred in Los Angeles, as a result of the verdict. During those riots, 54 people died and more than two thousand people were injured, and protestors burned more than 800 buildings (Cannon, 1999). This incident showed the importance of having a video record of an event. Many minority people have probably been beaten by police officers, but their beatings did not have as much impact on law enforcement procedures or the public's perception of police practices. The difference, in this case, was made by just one person who recorded the incident and handed over the tape to the media.

The Rodney King case showed police administrators the importance of video recording as a potential tool for increasing accountability among rank and file officers. Even though people may have been beaten by law enforcement officers in the past, it was often difficult to prove exactly what had occurred. When developing the argument for video recording, one can ask the question "If the officers were required to videotape all interactions with citizens or suspects, would they have beaten Rodney King?" It is quite likely that they would not have beaten Mr. King in the presence of video cameras. In other words, they could not use inappropriate force while arresting him, because it is almost impossible to think that officers would produce such evidence against themselves.

The videotape of the Rodney King beating showed that technology could be used to make law enforcement officials accountable for their behavior. Law enforcement

personnel must be seen as being impartial, and they are accountable to their chiefs and to the public (Schwabe, Davis, & Jackson, 2001).

After the incident, the Christopher Commission was established to investigate problems in the Los Angeles Police Department (LAPD) (Christopher Commission, 1991). The Christopher Commission made numerous recommendations, in order to fix the administrative problems of LAPD. One of the recommendations was to install in-car cameras to reduce the inappropriate use of force. The Christopher Commission (1991) emphasized the importance of video recording in policing. The commission indicated that the use of video recording in patrol cars may reduce the inappropriate use of force, and the footage produced by the police car cameras may help police officers defend themselves in court against allegations (Christopher Commission, 1991).

The Christopher Commission (1991, p. 64) noted that even though the installation of in-car cameras is costly, “the costs of video technology may be offset or recouped if the system reduces excessive force claims.” The report (1991) argued that officers would be more careful in front of the in-car cameras while using force and the recorded evidence can show that the officers acted properly. In addition, the report argued that in-car cameras can also influence the behavior of suspects by functioning as a deterrent on the violent behavior of suspects against police officers. The report clearly shows the potential benefits of in-car cameras by controlling the behavior of both citizens and officers.

The Effects of Surveillance Technology on the Behavior of Both Citizens and Officers

Whenever officers use force in an encounter, cameras can help clarify whether officers complied with departmental policies in the use of that force. Surveillance cameras have numerous benefits in policing, by influencing the behavior of both police officers and citizens. Because of the effect of cameras on both officers and citizens, the police agencies that use in-car cameras are expected to record fewer and to exonerate more citizen complaints, particularly those regarding the inappropriate use of force, than police agencies that do not use in-car cameras. The reasons for recording fewer complaints and exonerating more complaints are explained in the following sections.

Ensuring Officers' Compliance and In-Car Cameras

The low visibility of patrol work and the fact that it is often hidden from supervisory officers results in the independent nature of street-level officers. However, the presence of surveillance cameras, such as a CCTV system, changes this situation, for several reasons. First, officers' performance and activities are monitored by their respective supervisors. Second, the cameras produce independent records, with the videotaped evidence being used to dispute the police version of an incident. Third, the cameras capture the misconduct of both police officers and citizens (Norris & Armstrong, 1999).

While reviewing the in-car camera policies of state law enforcement agencies, the researchers found that nearly all of the in-car camera policies instruct officers to videotape all traffic stops, police pursuits, and citizen contacts completely. In addition, the researchers discovered that the policies of those agencies emphasize the importance

of in-car cameras in terms of enhancing the professional performance of the officers (IACP, 2005).

Those videotapes can be utilized to develop the organizational behavior of officers. The appropriate use of force can be counted as an organizational behavior of officers because the use of force policy of police agencies defines, explains, and allows officers to use force. In other words, the use of force policy consists of instructions to officers and directs officers to use appropriate force, according to the instructions in that policy. However, officers make a decision as to how much force should be utilized, depending on the behavior of the suspect because each incident is unique. The officers determine, using their own discretion, how much force will be applied. While use of force policies can be considered the theory of exercising force, the videotaped evidence of use of force incidents can be considered the practice of this theory.

While watching these videotaped incidents, new officers can learn the appropriate use of force. Furthermore, officers can learn from their mistakes while watching their own or their fellow officers' videotapes. Moreover, when videotapes are used as a training tool, officers learn to solve problems in effectively communicating with citizens or suspects. In other words, they learn to solve problems without using force. It could be expected that police agencies using in-car cameras would have fewer citizen complaints than other police agencies, because their officers' displayed greater levels of appropriate behavior.

In-car cameras increase officer compliance with departmental policies. Some sources argue that video evidence may help to exonerate officers who have been the

subject of physical abuse complaints (J. Kuboviak, personal communication, October 06, 2007; IACP National Law Enforcement Policy Center, 1993). The statement ‘helping exonerate officers’ assumes that the officers complied with departmental policies, such as the use of force policy, while interacting with citizens, and they do not violate any rules or regulations. By video recording officers’ behavior, it is presumed that officers will be more likely to comply with departmental policies, because officers do not want to be caught on video implicating themselves in wrongdoing. In addition, when officers comply with departmental policies because of the presence of in-car cameras, it can be predicted that the department will receive fewer complaints in comparison to other departments. There are a number of explanations in regard to how in-car cameras control the behavior of officers and increase their compliance with departmental policies:

First, sometimes, some officers overreact to a potential or real immediate danger. Crank (2004) points out that overreaction may explain brutal behavior of the police. It means that the other party starts the negative or nasty encounter with the police; then, the officer reacts very strongly to control the situation during a controversial encounter (Crank, 2004). Some officers may not be able to control their behavior, when they have an encounter with a suspect who attacks them. They may respond to the attacker with more force than is necessary. In other words, they may not adjust the amount of force that is needed, while responding to a physical attack, and they may use unnecessary force without realizing it. Surveillance cameras, used as a monitoring and control mechanism, may help them to control their behavior during such crisis situations.

Second, the unrestricted ownership of firearms that is found in the U.S. may increase tensions during an encounter. It is easy to obtain and possess firearms in the U.S. in comparison to other countries where firearm ownership is strictly regulated. If a person does not have a criminal background or history of mental illness, he/she can purchase a firearm easily. Citizens and even non-citizens need wait just a couple of days for a background check to be completed to purchase a firearm. Because of the easy access that citizens have to firearms, police officers in the U.S. are more likely to assume that the driver or the occupants of a car are armed, than are law enforcement officers in other countries. This makes the encounters stressful for police officers, with the result that even a little uncooperative behavior on the part of a citizen can result in the use of inappropriate force by an officer. The presence of an in-car camera may help officer to control his/her aggressiveness during an encounter.

Third, in-car cameras help officers to behave more respectfully toward citizens or suspects. Police officers' attitudes to citizens or suspects can be used to predict whether force will be utilized in a given encounter. Officers may escalate tense situations, making them worse encounters. A police psychologist noted that police officers must have the ability to soothe a stressful situation and they must learn to be authoritative rather than authoritarian (Abshire, 2009).

The word authoritative may be defined as possessing the power of special knowledge or displaying the confidence of that special knowledge. In contrast, the word authoritarian may be defined as the asking of total obedience by people who are in positions of authority (Cambridge Dictionaries Online, 2009). An authoritative officer

controls a stressful situation with his special knowledge and self-confidence; but an authoritarian officer tries to control a stressful situation by using his police power, without considering the situation or psychological status of suspects or citizens during an encounter. It may be predicted that an authoritarian officer is more likely to escalate a stressful situation, leading to citizen complaints of unprofessional conduct.

When officers behave respectfully to citizens or suspects, their behavior leads to better results (Abshire, 2009). It may be predicted that when officers behave respectfully during an encounter, fewer situations will arise that require the use of force by the police. Certainly, respectful behavior by officers can lead to fewer citizen complaints about the inappropriate use of force.

Fourth, after dealing with uncooperative suspects throughout a work shift, in-car cameras can help police officers control their levels of frustration, while dealing with tense incidents later in their shift. As a control mechanism, in-car cameras should encourage officers to stay within the legal limits of conduct. Officers would probably not choose to use inappropriate physical force, because the video evidence could be used against them during internal investigations or subsequent civil litigation. Hence, police departments that use in-car cameras should have lower rates of unnecessary use of force complaints than police departments that do not use in-car cameras.

Fifth, video evidence, recorded by in-car cameras, is a tool used by police supervisors to monitor officers' performance in remote areas (IACP, 2005). The recordings of in-car cameras can become a tool used for performance evaluations. When an officer perceives that the footage will be used for his/her annual performance

evaluation, he/she will be more likely to comply with departmental policies during an encounter with citizens.

Sixth, videotape records, captured by in-car cameras, can provide useful training footage. The in-car camera records can be used as a training tool for self-evaluation and training new officers (IACP, 2005). Cuthbert, Spearns, & Cowper (1992) found that in-car camera records can be employed as a training tool for the situations of traffic stops and crowd control.

The camera records improve the organizational behavior of officers in two ways. First, camera records help new officers to learn the manner in which they are expected to behave during encounters with citizens. While watching video records of their senior officers, new officers can learn how to display appropriate organizational behavior and to act professionally. Second, camera records display mistakes made by officers' and officers then learn from their own mistakes.

In these two ways, camera records used for educational purposes, can increase officer compliance with departmental policies and improve police professionalism in the field. For instance, after one officer reviewed a high-speed chase by Dallas patrol officers, captured on videotape by his in-car camera, he realized that passing another patrol car was a mistake, and he promised not to repeat it. This officer's car reached a speed of 130mph during the chase (Eiserer, 2008). The videotape gave the officer an opportunity to evaluate himself and to learn from his mistake.

Ensuring Citizens' Compliance and In-Car Cameras

Some law enforcement agencies require officers to notify citizens that an encounter is being videotaped. Research by the International Association of Chiefs of Police examines the impact of in-car cameras on the number of complaints recorded by the police departments, in states that require versus those that do not require officers to notify the individual that he/she is being videotaped. No significant correlation was found between the required notification of videotaping and the number of complaints received regarding police misconduct (IACP, 2005). However, in this current study, it is hypothesized that the other party of the encounter, such as suspects, citizens, and offenders, will change their behavior if they know that the encounter is being videotaped. The other party's behavioral change is expected for the following reasons.

First, the report of the Christopher Commission (1991) argues that in-car cameras can enhance officer safety, because those cameras deter violence by suspects against police officers. The presence of in-car cameras increases the compliance of suspects and citizens with the legitimate orders of law enforcement officers. In other words, in-car cameras can increase cooperative behavior in citizens and suspects if they know that the encounter is being videotaped. Sechrest, Liquori, & Perry (1990) indicate that video cameras deter suspects from resisting arrest, and when suspects are less likely to resist arrest, officers are less likely to use force. If this is true, it can be expected that police agencies using in-car cameras should receive fewer citizen complaints about the inappropriate use of force by police.

Second, in-car cameras can prevent intentional false allegations of police wrongdoing. False allegations of police misconduct can be diminished, if citizens understand that video records captured by in-car cameras provide an impartial record of an incident (IACP, 2005). Individuals arrested by law enforcement officers may file false complaints against officers, intentionally, for several reasons, the first reason being revenge. If an officer ignores the illegal activities of a suspect, they will not have to serve time in a jail or pay a fine. In other words, suspects see law enforcement officers as the reason for their incarceration. The second reason is that they hope that the charges against them may be reduced. In addition, suspects may make false complaints to recover money from police agencies (Snow, 2007). In these situations, if a suspect is informed that his/her behavior is being videotaped by an in-car camera, he/she may be deterred from making a complaint against an officer. Thus, it may be expected that fewer false accusations of unprofessional conduct will be made against police officers and fewer citizens will file complaints of officers' wrongdoing.

Third, because of their high levels of frustration, while being arrested or during their time in police custody, suspects sometimes injure themselves, intentionally, so that they can file lawsuits against police officers. This can be seen as a kind of revenge complaint against officers. Suspects may hit their heads on police cars or on the walls in police buildings, and they may claim that the police used inappropriate force and file a lawsuit against the police agency. For instance, after a suspect was placed in a police car while being handcuffed, a witness saw the suspect injure himself by hitting his head against the car's window. The suspect claimed that officers used inappropriate force,

even though he injured himself (Zdan & Queally, 2009). If suspects know that they are being videotaped, they may not injure themselves intentionally and they may not be able to file a false lawsuit against the police.

Fourth, the presence of an in-car camera may reduce aggressiveness and increase cooperative behavior of a citizen during an encounter with an officer. Almost 50% of the observed inappropriate use of force incidents took place when the victims verbally refused to recognize police authority (Reiss, 1968). It appears that when citizens are aggressive towards police officers, the officers will most probably react aggressively toward citizens (IACP, 2005). It can be predicted that aggressive behavior of a citizen, during an encounter with an officer, may be the reason for use of force by the police. Excessive use of force by the police can cause an increase in citizen complaints about inappropriate use of force. If the presence of in-car cameras reduces the aggressiveness of citizens, it can be predicted that the officers are less likely to use inappropriate force, and that the police department will receive fewer citizen complaints about the inappropriate use of force.

As a control mechanism, police in-car cameras may deter suspects from misbehaving or displaying uncooperative behavior. Without video records, police personnel may not have any evidence to prove that they did not harm the suspects. Even though officers act properly, these complaints may reduce public trust in the police in the absence of videotaped evidence.

Unintentional False Allegations

In some circumstances, in-car cameras increase the likelihood of officer compliance with regulations but have little effect on citizen or suspect behavior. The reason for this is that a citizen may not know that the amount of force used by an officer was appropriate, because they were under the influence of alcohol or drugs at the time that force was applied. Therefore, even though an officer may use appropriate force, he/she can be accused by citizens or suspects of using inappropriate force. This results in an increase of unintentional false allegations, citizen complaints, and exonerated citizen complaints.

Surveillance cameras can influence a citizen's decision to file a complaint. The citizen may not know that their interaction with an officer was videotaped during traffic stops or other interactions, and they may feel that the officer used unnecessary force. If the video record shows that officers used legitimate force, the citizen complaint against the officers may be dropped. These situations indicate that because of surveillance cameras, officers act lawfully even though citizen and suspects do not necessarily agree with the level of force employed.

In-car camera records can resolve unintentional false allegations. Even though officers may have acted legally in the presence of in-car cameras, suspects may file false complaints against officers, unintentionally. Suspects may attack officers, causing injury to either the officer or both officer and suspect, during an arrest. Suspects may later believe that officers used inappropriate force. If they file a complaint against the officer, the video record will provide an impartial account of the interaction and can determine

whether the officer used inappropriate force. Kuboviak (personal communication, October 06, 2007), a national expert on mobile video recording for police agencies in the U.S. and the director of the Law Enforcement Mobile Video Institute, asserts that police officers have had more complaints filed on them recently than at any other time in U.S. history. However, Kuboviak (personal communication, October 06, 2007) points out that in-car cameras have proven an effective method of disputing false allegations. Hence, it can be expected that video records captured by in-car cameras will increase the number of exonerated citizen complaints in such encounters.

Ardila (2005) noted that the South Carolina Highway Patrol installed video cameras in late 1991, with the specific purpose of providing better evidence in drunk driving cases. Video cameras installed in patrol cars provided invaluable evidence from all kinds of traffic stops, including those where assaults on patrol officers occurred. When people drive under the influence of alcohol or drugs and are stopped by the police, they may attack the officers. Later, they may not be able to remember anything about the assault. At the time of the arrest, officers may have to use a legitimate, elevated level of force, in order to protect themselves and suppress the assault. After seeing the bruises on their body from the use of force, a suspect may file a complaint about the inappropriate use of force, against the officers. However, after the evidence tape is reviewed, they may withdraw their complaint or their complaint may be dismissed.

In one example, a police officer in Ohio was accused of unnecessary use of force after a verbal argument with a woman (IACP National Law Enforcement Policy Center, 1993). She intended to file a lawsuit against the officer. But after she was shown an

audio/video recording of the incident that clearly showed that the officer acted properly, all allegations were dropped against the officer (IACP National Law Enforcement Policy Center, 1993).

Monitoring Versus Professionalism

It can be argued that monitoring employees within the workplace displaces professionalism, monitoring implicitly assumes because the assumption is that the employees are not professionals, they inherently do not like work, and if they find an opportunity, they will not perform their duties as expected by their supervisors or employers.

According to Weber's (1946) 'ideal type of bureaucracy', bureaucrats are hired because of their technical knowledge and assumed that they are professionals. The reason for this perception is that they are hired because of their education. For instance, police officers are hired because of their police education and having policing knowledge. After graduation from the police academy, they are hired by police agencies. So, even though they are assumed to be professionals, in theory, it is contradictory to monitor their behavior and activities while they are performing their official duties.

Kuboviak (2004b) argues that in-car cameras are used, at present, to gather evidence or control the behavior of officers. But he points out that in-car cameras should be used to gather evidence rather than increasing the integrity of officers by monitoring their behaviors in the field. He states that in-car video systems are not designed to replace police ethics. Petersen (2001) also emphasizes that employees feel that they are not trusted if they are regularly being monitored.

However, an in-car camera videotapes not only criminals but also the activities of officers in remote areas while performing their duties. The goal of gathering evidence from in-car cameras already includes enhancing police integrity, because officers have to display ethical behavior in the presence of cameras. Unethical behavior by officers, captured by in-car or CCTV cameras, can alert the police authorities to open an internal investigation or to fire the officer in question.

Police brutality, like that seen in the Rodney King incident, demonstrates that law enforcement officers can behave unethically, either intentionally or unintentionally, while, at the same time, they are assumed to be professionals. In addition, the existence of citizen complaints against law enforcement officers is another indicator that police misconduct or police abuse of power occurs. If police are professionals, large law enforcement agencies would not receive 26,556 citizen complaints about the inappropriate use of force in 2002 (Hickman, 2006).

Even though officers are assumed to be professionals, their activities are still monitored, and this observation can be extended to the issue of trust. One of the main concerns regarding in-car cameras is the identity of the officer that pulls out the recorded video from a police car and brings it to the storage facility. Some police agencies require a supervisor to remove the videotape or hard drive, while other agencies allow the officer who made the video to remove the videotape or the hard drive, and take it to storage (Kuboviak, 2004a).

Kuboviak (2004a) maintains that if a supervisor is required to remove the recorded video from the car and bring it to the storage facility, it means, implicitly, that

officers are not trusted in the police agency. Kuboviak (2004b) argues that even though officers are granted the right to restrict people's freedom and even to use deadly force, restricting their access to recorded evidence is contradictory and ridiculous. In other words, on the one hand it is assumed that officers are both honest and professional but, on the other hand, they are assumed to be dishonest.

The second party involved in disputes, recorded by in-car cameras, is the law enforcement officer. If the videotape contains footage of an offense in which that officer is involved, it is logical and advisable to restrict the officer's access to the recorded evidence. When there is videotape evidence of officer offenses and something happens to those videotapes, the officer whose actions are recorded will be under suspicion. Therefore, it may be better for a supervisor, as an impartial and neutral third party, to deliver the videotape to the storage facility. In cases where an officer receives a citizen complaint and there are allegations that the videotape evidence has been altered or destroyed, a law enforcement officer can easily defend himself/herself by stating that he/she has no access to the videotaped evidence.

Limitations of In-Car Cameras in Predicting Police Misconduct

There are some limitations on mobile camera systems. According to Kuboviak (personal communication, October 06, 2007), the theory that in-car video cameras make better officers assumes the need for big brother watching from the car to make sure that officers do their jobs. In-car cameras may not be effective in increasing officer compliance and professional conduct. In addition, surveillance cameras may not be able to record over a long distance and, thus, may not be able to capture all encounters.

The first limitation is that savvy officers can cheat the surveillance technology. Kuboviak (personal communication, October 06, 2007) argues that if an officer is already dishonest, then the in-car video system is not going to stop him/her from committing illegal acts. According to him, the manufacturers sell their mobile surveillance products based on promises to increase conviction rates, reduce police liability claims, and increase public accountability of law enforcement officials (personal communication, October 06, 2007). It appears that in-car cameras are not sold to control officers' conduct, because it is already assumed that officers are professional, they comply with departmental policies, and they act lawfully.

The second limitation is that a mobile camera in a police car cannot capture everything happening outside of the police car, although technology continues to expand the visual range of video recording. For example, there are mini-cameras even in mobile telephones. A mini-camera placed on a police officer's uniform can serve its purpose better than an in-car camera. While running after a suspect, the mini-camera can record the suspect's behavior, but an in-car camera is useless in such situations. In addition, if there is a need to use force against a suspect who has fled police custody, only a mini-camera, placed on the uniform can record the encounter.

The third limitation is that it can be claimed that officers use surveillance cameras in a way that avoids recording their misconduct. It is perceived that video surveillance is more impartial, objective, and fairer than eyewitness statements. However, in research performed on CCTV surveillance cameras, it was discovered that white male officers observed and recorded mostly females and minorities. In other words, the cameras of

white males swiveled toward and zoomed in on females and minorities for the most part (Petersen, 2001). According to Petersen (2001), this finding suggests that the objectivity of video surveillance depends on the individual who controls the camera. In-car cameras may also be subjective and unfair. Officers may use in-car cameras in ways that only collect evidence that supports them.

The fourth limitation is that video cameras are not used by the horse, foot, bike, and motorbike patrol units now common among most police departments. Encounters between citizens and these patrol officers are not recorded. In such an encounter, if a patrol officer who rides a horse, bike, and motorbike or patrols on foot receives a citizen complaint about inappropriate use of force, there will not be a videotape showing the encounter.

Surveillance Technology Research

Some monitoring technologies have been used in order to monitor the quality of task performance behavior of an employee. Electronic monitoring of email and internet usage has been used to reduce off-task behavior of employees and increase their productivity. There are some studies that explore the perceptions of employees regarding electronic monitoring in the workplace. Stanton & Weiss (2000) did an exploratory study to determine whether email and website monitoring influences on-the-job behaviors of employees. The researchers asked on-line and open-ended questions to 53 business sector employees, and then analyzed the responses they received.

Even though their study cannot be generalized to a larger population, Stanton & Weiss (2000) found that monitoring technologies change the 'unproductive behavior' of

employees in the workplace. These unproductive behaviors may be identified as playing computer games during work hours, using a company email account for personal messages, and surfing internet websites that are unrelated to his/her job. The same logic predicts that in-car and CCTV cameras can change uncooperative behavior of citizens and these cameras can change inappropriate behavior such as unnecessary use of force of officers during an encounter.

When a patrol officer stops a citizen, the video camera in the patrol car records the encounter, documenting the behavior of the citizen and the officer (Weitzer, 2005). Even though Weitzer (2005) claims that there is no research that evaluates the impact of in-car camera monitoring systems on racial profiling and other police abuses during traffic stops, some recent studies have been done on surveillance technology in policing.

Surveillance technology is used while interrogating suspects to prevent police misconduct. McConville (1992) studied the behavior of police officers during interrogations, both when video cameras were turned on and when they were turned off. This researcher videotaped 20 cases, over a five week period, in an English police station in 1991. Even though he observed that officers were highly motivated to show that they were handling suspects appropriately, he concluded that it is impossible to use videotapes to differentiate ethical behavior from unethical behavior of officers.

Even though the researcher did not inform the investigators as to when the video recorder was turned on or off, the presence of the recorder made the investigators behave more cautiously during the interrogations. This research demonstrated that even though a video recorder may have been turned off, its presence was enough to control investigators

so that they did not demonstrate unethical behavior. In other words, no variation in the behavior of interrogators was observed. This finding is consistent with the findings of the Hawthorne studies. Hawthorne effect is one of the findings of these studies, people alter their behavior when they are aware of being monitored (Denhardt, Denhardt, & Aristigueta, 2002; Roethlisberger, 1941).

The Halifax Police Department (Canada) evaluated an in-car camera system in 1991 (Cuthbert, Spearns, & Cowper, 1992), installing it in a patrol vehicle. The camera was used in a variety of cases, such as disturbances, arrests, impaired driving, and high speed chases. Cuthbert, Spearns, & Cowper (1992) concluded that the behavior of people was different when they were aware that their actions were being recorded. The authors pointed out in their report that the use of in-car cameras is a positive step forward in policing, and that the use of cameras will lead to more professional behavior by police officers. In other words, the cameras can be seen as a type of motivation for police officers to behave in a professional manner.

Goold (2003) evaluated the effects of closed-circuit television (CCTV) cameras on the behavior of police officers in the U.K. In this qualitative study, officers were interviewed and asked whether the cameras affected their behavior, while responding to incidents and having their actions recorded by CCTV cameras. Two-thirds of the police officers interviewed stated that the CCTV cameras forced them to go by the book and reminded them to be more careful while patrolling in public places.

In other situations, some of the officers stated that they felt that the CCTV camera records were being used against certain officers in order to convict them for citizen

complaints. In most cases though, these records are used to dismiss citizen complaints regarding unlawful arrests or unnecessary use of force. According to some police officials, the CCTV cameras reduced the frequency of formal citizen complaints against police officers. In addition, the researcher argued that one of the disadvantages of CCTV cameras is that they make some officers less willing to use force when necessary, because of their concerns about citizen complaints (Goold, 2003).

The International Association of Chiefs of Police (IACP) (2005) evaluated the impact of in-car cameras. Line officers, midlevel and executive police managers (3680 individual officers responded) from state police and highway patrol agencies in 20 states were surveyed. It was found that 20% of the officers believe that in-car cameras promote courtesy and professionalism. Furthermore, 8% of the officers experienced that citizen complaints against them were reduced. Moreover, it was found that while courtesy and professionalism are increasing, the number of sustained citizen complaints is decreasing. In addition, it was discovered that officers who believe that their supervisors review the tapes regularly, tend to improve the amount of courtesy they show to others.

It was found that officers experienced that only 5% of all complaints against them were sustained; on the other hand, 93% of complaints were exonerated, based on video evidence recorded by in-car cameras. Furthermore, the supervisors stated that about 50% of the complaints were withdrawn, after the complainant had been informed that the traffic stop or encounter was recorded. Moreover, it was found that most of the state agencies which used in-car cameras had a large number of exonerated complaints, when video evidence of the incident was available. In addition, the internal affairs' officers

stated that after the installation of in-car cameras, the volume of complaints which were forwarded to them for investigation decreased because an increased number of citizen complaints were resolved or dealt with by the first line supervisors (IACP, 2005).

The presence of an in-car camera may reduce aggressiveness and increase cooperative behavior of a citizen during an encounter with an officer. It was found that 48% of officers experienced that citizens often calm down and are less aggressive after being informed that an encounter is recorded, during traffic stops. In addition, of those officers who experienced that citizens become less aggressive during an encounter, 26% of them experienced that citizens also display politer behavior in the presence of in-car cameras (IACP, 2005).

International Association of Chiefs of Police (2005) also surveyed 900 citizens in 18 states. It was found that 51% of the citizens believe that they modify and change their behavior in the presence of an in-car camera. Furthermore, the citizens stated that they would be less aggressive if they knew that they were being videotaped. The citizens were also asked whether the presence of an in-car camera would influence their decision to file a complaint against an officer. It was found that 48% of citizens believe that they would be less likely to file a complaint and 34% of citizens think that they would be more likely to file a complaint. The findings of the research suggests that most citizens believe that in-car cameras help prevent police misconduct and to ensure the integrity of officers (IACP, 2005).

Ma (2006) surveyed sworn officers in smaller police departments (employing average 30 sworn officers) to find out their opinion on the use of in-car cameras. 62

officers (67%) responded to the survey. It was found that officers strongly agreed that video evidence captured by in-car cameras helped officers to be proven innocent.

Furthermore, officers agreed that the utilization of in-car camera ensures their interactions with citizens are handled in a professional manner. Moreover, officers agreed that the utilization of in-car cameras assist their supervisors in overseeing officers. In addition, officers agreed that the utilization of in-car cameras improve officers training.

It was discovered that officers with less than six year policing experience are more likely to believe that in-car cameras ensure that their interactions with citizens are handled in a professional manner than officers with six or more years policing experience (Ma, 2006). This means that as the length of service increases, officers are less likely to feel that in-car cameras ensure that interactions with citizens are handled in a professional manner. In other words, it means that as the length of service increases, officers behave more professionally during the encounters with citizens. Senior or experienced officers already behave professionally and they do not feel pressure from in-car cameras to change their behavior. Thus, it can be predicted that senior officers will be less likely to use inappropriate force against citizens. When it is assumed that patrol officers spend few years in policing compared to officers work in other divisions, in-car cameras may be an effective control mechanism over patrol officers.

It was found that officers with less than six year policing experience are more likely to believe that the presence of in-car cameras affect their decision when considering use of force than officers with six or more years policing experience (Ma, 2006). This means that the presence of in-car cameras is more likely to influence the

decision to use force in officers who have spent only a few years in policing, than in those who have been in policing for a longer time. Thus, it can be expected that more experienced officers will be more professional in terms of using appropriate force, because of their prior use of force experiences. Hence, in-car cameras will not affect experienced officers' decisions to use physical force against citizens or suspects when necessary. However, in-car cameras may affect patrol officers behavior spend few years in policing.

On the other hand, some findings of Ma's (2006) research do not support the predictions of the current research. The officers have no opinion whether the presence of in-car cameras improve their professional demeanor during an encounter with citizens. Furthermore, officers disagree that the presence of in-car cameras has an effect on the behavior of citizens when interacting with officers. Moreover, officers strongly disagree that the presence of in-car cameras influences their decision when considering use of force. In addition, officers have no opinion whether they review their own videos for the purpose of self assessment. Those four findings do not support the prediction of the current research, that in-car cameras reduce citizen complaints about inappropriate use of force.

It is proposed that the use of video cameras in patrol cars can eliminate racial profiling and settle the problem of discrimination by the police. Dierickx (2008) scrutinized the impact of in-car cameras on racial profiling. This researcher looked at in-car camera archives and investigated the police-citizen interactions in each traffic stop, in order to understand the utilization and usefulness of in-car cameras in two police

departments. Her content analysis of the police-citizen contacts, recorded by the in-car cameras, demonstrated that in-car cameras do not solve the racial profiling problem.

The Research on Citizen Complaints about Police Abuse of Power

Several studies have used citizen complaints concerning police abuse of power as a dependent variable, when evaluating the effect of the predictors on the dependent variable. The theory behind these studies is that the organizational behavior of police agencies influences officer behavior in lessening citizen complaints about police abuse of power. The following studies are important because they provide empirical support for the model specified in this research initiative.

Cao, Deng, & Barton (2000) tested Lundman's organizational product thesis with data on citizen complaints about inappropriate use of force by the police. Lundman's thesis suggests that organizational deviance produces police misconduct; hence, the organizational climate must be controlled, rather than the individual officer's behavior, to ensure conformity of personnel within internal operating norms.

These researchers used data from a national survey on municipal police departments. Police departments that employ 50 or more sworn officers were selected for their sample, which included 535 municipal police departments in the U.S. Tobit regression was used to analyze the data. The dependent variable was the total number of citizen complaints about inappropriate use of physical force received by each municipal police department in 1991. Independent variables were education, civilian review board, gender, race, length of service, field training officer program, pre-service psycho exam, in-service training, reporting to supervisors, regular reviews, less-than-lethal policy, and

reporting requirements. The researchers used the average number of arrests and population size as control variables.

The dummy variables were citizen review board, pre-service psycho exam, field training officer program, reporting to supervisors, and less-than-lethal policy. Gender, education, and race were operationalized as the percentages of females, officers with at least B.A. or B.S. degrees, and Black officers in each police agency. Length of service was coded as the average years served of all sworn officers in a police agency.

In-service training was operationalized as an index variable depending on whether the police agency requires (2), recommends (1), or does not provide (0) in-service training for the use of non-lethal force, the use of deadly force, the use of non-lethal weapons, and firearm requalification. Reporting requirements is also an index variable. It indicates whether the police agency requires (2), recommends (1), or does not require (0) filing a report when officers use batons, chemical agents, and other impact devices or a flashlight.

The regular review was coded as an ordinal variable and indicates whether the police agency reviews and investigates the reports of use of force, even if a civil suit or citizen complaint has not been filed. A (1) indicates that the police agency does not review or investigate reports, (2) means that the agency reviews and investigates selected reports, and (3) indicates that the agency reviews and investigates all reports. Arrest was operationalized as the average number of arrests made by an officer. Population was a grouped variable with (1) for cities less than 10,000 residents, (2) for cities with

populations of 10,000 to 24,999, (3) for cities with populations of 25,000 to 49,999, and (4) for cities with 50,000 or more residents.

Cao, Deng, & Barton (2000) found that the existence of a civilian complaint review board, larger percentages of Black officers, higher numbers of arrests, and larger populations were related to higher citizen complaints. On the other hand, they found that longer average service, the existence of a field training program, and mandatory in-service trainings were related to fewer citizen complaints.

Cao & Huang (2000) used the same data with different dependent variables regarding citizen complaints. They researched the impacts of organizational determinants on citizen complaints of police abuse of power, and tested two theories used in this study: the professionalism control thesis and the organizational product thesis. According to the professionalism control thesis, police administrators hire the best-trained and most honest candidates. The bureaucratic model supported this theory, since it assumes that rules and regulations are issued and enforced via the supervisory activities of police personnel. On the other hand, the organizational product thesis suggests that organizational deviance produces police misconduct; hence, organizational climates must be controlled.

Cao & Huang (2000) used citizen complaints regarding illegal search or seizure, unlawful arrest and detention, misuse of authority, harassment and intimidation, and improper language as dependent variables. And they excluded citizen complaints about the inappropriate use of force from their research. The source of their data was a survey conducted in 1992, by Pate & Fridell (1993). Their data were drawn from 731 municipal police departments in the U.S., and Tobit regression was used to analyze the data.

Their independent variables are the indicators of organizational behavior and organizational characteristics. Independent variables are: the length of police academy training, requiring psychological exam before admitting police candidates to a police academy, having field-training officer programs, having a policy of the use of less-than-lethal weapons, the number of in-service training programs on the use of force, requiring officers to report incidents of employing force, requiring officers to report to supervisors about an incident, requiring citizens to have clinical evidence for filing a complaint, having the civilian review board, the number of officers holding at least B.A. or B.S. degrees, the number of Black officers, the number of female officers, and the average age of sworn officers in each police department. The number of arrests and population size are used as control variables.

Cao & Huang (2000) found that the reporting requirement, requiring officers to report incidents where force was used, has resulted in a significant increase in citizen complaints of police abuse of power. Stricter requirements indicate more supervisory control and it is associated with fewer citizen complaints. Even though the theory predicts that stricter requirements will be associated with fewer citizen complaints, this finding contradicts the theory. Furthermore, the clinical requirement, requiring citizens to have clinical (solid evidence such as a medical report) evidence for filing a complaint, has significantly decreased citizen complaints. Moreover, an increase in the average age of sworn officers has significantly decreased the number of citizen complaints. In addition, the researchers found that population size is positively correlated with citizen complaints.

According to the researchers, both theories recognize that the police administration has the capacity to affect officers' behavior.

Other studies have investigated whether there is an increase in citizen complaints about the police, when police organizations make it easier to file complaints. Worrall (2002) determined whether police agencies with: an internal affairs unit, a citizen complaint review board, an early warning system, and an electronic complaint database received more citizen complaints than other agencies. The independent variables were operationalized as dummy variables with (1) being the existence of these procedures and (0) being the lack of them. The researcher used: the ratio of minorities, the crime rate, the percentage of unemployment, agency training and education requirements, department size, and the ratio of officers to citizens as control variables.

In terms of information systems, in-car cameras can support the early warning system of a police agency. Videotaped evidence may back the early warning system of a police department, by providing evidence about officer performance and the psychological situation to supervisors (IACP, 2005). Thanks to videotaped evidence, easily stressed or agitated officers can be tracked and officer-generated problems, involving citizens, can be prevented. Accordingly, the inappropriate use of citizen complaints can be reduced.

The variable, minority, was operationalized as the ratio of Hispanics and Blacks to the population, and crime rate was operationalized by dividing the number of index crimes by the population. Index crimes are homicide, criminal sexual assault, robbery, aggravated assault/battery as violent index crimes and burglary, theft, motor vehicle theft,

and arson as property index crimes. Unemployment was operationalized as the percentage of unemployment, and total training was operationalized as the total number of training hours. Education was operationalized as a continuous variable, from (1) high school to (4) bachelors' degree. Department size was also operationalized as a continuous variable. The ratio of officers to citizens was operationalized as the number of officers per thousand citizens.

Worrall (2002) used data from a survey of 417 law enforcement agencies. Citizen complaints about: the inappropriate use of force, threatening behavior, and other issues were the dependent variables used in Worrall's research. The researcher used negative binominal regression to analyze the data, and found that police agencies having complaint databases receive more citizen complaints than police agencies without such databases. In addition, the researcher found that a higher agency size and a higher crime rate were associated with more force complaints.

The electronic complaint database was defined as a computerized system designed to track the occurrence of citizen complaints (Worrall, 2002). According to the researcher, an electronic complaint database may indicate professionalism and a real concern about the complaint problem. Citizens may feel more comfortable about complaining, because their complaints will be given serious attention by the agency. On the other hand, it may be that agencies using such databases have higher numbers of complaints because they have more accurate records than other agencies. In summary, the researcher found that facilitating citizen complaint procedures resulted in an increase in

citizen complaints. The researcher implied that more complaints will be received by police agencies, when citizen complaint procedures are reformed.

The 2003 Law Enforcement Management and Administrative Statistics (LEMAS) survey also supports the findings of Worrall's (2002) study. LEMAS (2003) shows that police departments with a civilian complaint review board (CCRB) received more citizen complaints about the inappropriate use of force, in comparison to police agencies without a CCRB. The complaint rate was 11.9 per 100 officers for departments with a CCRB, in comparison to 6.6 per 100 officers for departments without a CCRB (Hickman, 2006).

Hickman & Piquero (2009) studied the impact of minority representation on the use of unnecessary force complaints among local police departments in the U.S. They theorized that citizen complaints would be higher in police jurisdictions having sworn officers with a minority representation that does not reflect the local population. They derived the data from the 2003 LEMAS survey; their sample consisted of 496 large municipal police departments which had 100 or more sworn officers.

Hickman & Piquero (2009) used citizen complaints about police use of force as a dependent variable. They used two dependent variables for use of force complaints; the first dependent variable was the rate of citizen complaints per 100 sworn officers, and the second dependent variable was the percentage of force complaints that were sustained. They used sustained use of force complaints to measure the seriousness of use of force incidents and to measure the agency's dedication to fight against the inappropriate use of force.

Hickman & Piquero (2009) used three categories of independent variables: organizational structure, administrative features, and environmental factors. For organizational structure variables, they used spatial, occupational, hierarchical, and functional differentiations, and formalization. The administrative features of a police agency used as variables were, the presence of: an internal affairs unit, a performance monitoring system, a separate investigation policy, a citizen administrative appeal, and collective bargaining. As environmental variables, the researchers used: presence of a civilian complaint review board, the violent crime rate, percentage of owner-occupied households, number of sworn officers per 10,000 residents, and the minority representation ratio.

Hickman & Piquero (2009) found that minority representation is unrelated to inappropriate use of force complaints and sustained complaints. In other words, they found that increasing the number of minority sworn officers in a local police agency is not related to decreasing the number of use of unnecessary force complaints by the minority population in a city. In addition, they found that having: greater spatial differentiation, an internal affairs unit, and a higher violent crime rate have significant positive association with the higher rates of force complaints. They also found that greater formalization and a higher violent crime have a significant positive association with higher sustained complaints. Furthermore, they found that having: a citizen administrative appeal process, collective bargaining, and a higher number of sworn officers have a significant negative relation to the fewer numbers of sustained complaints.

Example Cases of Police Use of Inappropriate Force

Video footage, recorded by police surveillance cameras, is widely available to the public in the United States. News agencies broadcast the footage, recorded by police surveillance cameras, on their websites, and the website youtube.com hosts many of the footages, taken by in-car and CCTV cameras. Law enforcement agencies are required to release the footages recorded by surveillance cameras to the public, because these footages are considered to be public records in the U.S, and the open record law requires the release of the footages upon request. Not only can the parties involved in an incident request the release of these records, but anyone else can also file a public information request to obtain a copy of an incident's footage.

The use of the term 'footage', rather than 'videotape', is preferred, because digital recording systems that are currently used by many law enforcement agencies, do not use VHS-type videotapes. In addition, the footage is stored on large hard drives in law enforcement agencies, not as VHS tapes. Some footage shows that surveillance cameras could not stop officers from acting brutally, or inappropriately. In order to develop a theory regarding surveillance cameras and inappropriate behavior of law enforcement officers, some footage of incidents, downloaded from the website of news agencies and youtube.com, are included in this section.

One footage, recorded by a fixed-site camera in a holding cell of a sheriff's department in Seattle, shows that a 15-year-old girl was beaten badly by a sheriff's deputy (Gutierrez, 2009). The footage shows that the girl was escorted by two officers into the holding cell. One officer wanted the girl to remove her shoes, but, instead, she

threw her left shoe, softly, at the officer. Her provocative behavior frustrated one of them, and that officer beat her badly, in the holding cell. Interestingly, the statement that the officer gave, before the release of the footage, did not match what the footage showed. While the officer blamed the girl, in his version of the incident, the footage showed the inappropriate behavior of the officer. This incident demonstrates that law enforcement officers may lie, when they give statements, or in their reports, even though videotaped evidence exists.

The footage shows that the officer could not control his anger or frustration, so the girl was beaten badly. This incident appears to be a human rights violation and an example of a police beating or police brutality; however, the officer was not found guilty by the jury, although the internal investigation has been continuing. After reviewing the footage, a detective also confirmed that the girl was under control, when the officer hit her (Gutierrez, 2009). This means that there was no justification to use physical force or, especially, excessive force, against a 15-year-old girl. In addition, even if it was necessary to use force against the girl, who was physically tiny and had weak muscles, in comparison to the officer, the officer's use of excessive force was not acceptable. Law enforcement officers are authorized to use force under certain circumstances, but the footage showed that the circumstances did not meet the requirements for using physical force.

However, some people may argue that the officer was right to behave in this manner, and some may argue that he was not. Citizens or suspects should be polite to law enforcement officers, during an encounter, even though they do not like being arrested or

being given a traffic citation. Even though the girl's impolite behavior was unacceptable, she did not deserve to be beaten by a law enforcement officer. Law enforcement officers may not be authorized to beat suspects, but they do have to report all the inappropriate behavior of suspects to prosecutors or judges. A suspect's inappropriate behavior can only be punished by a judge. Among all public personnel, law enforcement officers may most frequently experience the impolite behavior of citizens and suspects. However, they are required to behave or respond appropriately. A common belief is that suspects can do what ever they want to officers, but sworn officers must always behave appropriately².

In another incident, footage recorded by an in-car camera, showing police brutality, was concealed. It was discovered that officers hid the footage, recorded by an in-car camera, which contained evidence of an incident of police brutality that occurred in Birmingham, Alabama, and was found more than one year after the incident. Many police patrol cars were involved in the 50-mile high-speed chase, and more than one of the patrol car's in-car cameras recorded the chase. Even though the footages recorded by numerous in-car cameras were submitted to the prosecutor, the part of the footage containing the police beating was not submitted (Five Alabama police ..., 2009).

When the prosecutor tried to play the video that was originally submitted, to the jury, she could not play it for technical reasons and asked for the original videotape from the police department; at this time she discovered the footage of the beating on the original videotape (Associated Press, 2009, May 20). Although the prosecutor demanded the videotapes of the high-speed chase incident, immediately after the incident, it appears

² The incident can be watched on www.youtube.com (Associated Press, February 27, 2009).

that the part of the footage that contained the beating, was cut out and, then, a copy that contained the rest of the footage was given to the prosecutor, along with the videotapes recorded by other patrol cars' cameras.

After the discovery of the footage that contained the beating, five officers that were involved in the beating of an unconscious and unarmed suspect were fired. In addition, the suspect's attorney filed a lawsuit against the city for the brutal beating and the attempt to suppress the videotape. The videotape footage showed that the van, involved in the high-speed chase, flipped over and rolled into a ditch, and while the van was turning over, the suspect was ejected. While the unconscious and unarmed suspect was lying in the ditch, the officers ran towards the suspect and beat him ruthlessly with their fists and batons (Associated Press, 2009, May 20; Five Alabama police ..., 2009).

The investigators stated that the suspect was not aware of being beaten until he watched the footage, and that the suspect thought that his injuries were from the accident. Since disciplinary action can also be taken against supervisors who do not report beating incidents to their supervisors, the police chief of Birmingham asked for an internal investigation, to find out whether any supervisor had seen the footage containing the beating and, then, not reported this incident to his/her supervisors. In addition, he promised to review the department's reporting mechanisms and policies (Robinson, 2009).

The circumstances surrounding this footage, illustrates two important issues regarding the usage of in-car cameras. First, the videotapes or footages recorded by in-car cameras can be concealed. It appears that some officers in the police department

intentionally withheld the part of the videotape that contained the officers' inappropriate behavior, from the prosecutor, most probably in order to protect the officers from a lawsuit or disciplinary action. Also, it appears that police departments cannot delete the videotapes that are recorded by in-car cameras. If this department wanted to protect its officers, and the videotapes could be erased, then the person in charge of the videotapes and in-car cameras could delete the video records.

Second, it appears that these videotapes are not reviewed regularly. In general, when public organizations consider an issue important, they assign full-time personnel to deal with the issue seriously. Apparently, some police departments do not assign a supervisor to regularly review the videotapes recorded by in-car cameras. As a result, a videotape containing officers' inappropriate behavior may be in the department's storage area, but no legal action will be taken against the officers. It does not make sense for the department to use in-car cameras, if they do not review them regularly. It appears that the videotapes are reviewed only when there are citizen complaints³.

Another video footage, recorded by an in-car camera, showed that a constable deputy tasered a 72-year-old woman at a traffic stop in Austin, Texas in May 2009⁴. Even though the incident was a type of inappropriate use of force, the officer's supervisor commented that the officer did what he was supposed to do.

In the incident, the woman was pulled over by the officer for a speed violation. When she refused to sign the traffic ticket, the confrontation became nastier, and the

³ The incident can be watched on www.youtube.com, on the CNN website, and on the website of The Birmingham News, (Russdawgusmc, 2009; Five Alabama police ..., 2009; Robinson, 2009).

⁴ The incident can be watched on www.youtube.com (ABCNews, 2009; IdiocracyIndex, 2009).

officer ordered the woman to get out of the car for an arrest. The woman argued and fought with the officer, and the officer shoved the woman several times, when she attempted to get back in her car. According to the officer, he shoved her to keep her out of passing traffic (ABCNews, 2009; Celizic, 2009). Certainly, the officer would have been in bigger trouble, if she had been hit by a car during this simple traffic stop.

Then the officer ordered her to step back several times, but she disobeyed. Even though the officer threatened her with the taser, she did not obey the legal orders of the officer. And even though the woman was old, she disobeyed the law, and was non-compliant with the officer's orders. As a result, the officer tasered her and took her to jail. After the incident, but before the release of the incident's videotape, in a TV interview, she claimed that the officer lied on his report, because she did not argue or fight with the officer. In other words, she lied about the incident on TV, before the video record was released (ABCNews, 2009; Celizic, 2009). However, the video footage refuted her statement. This incident shows that citizens can also lie about what really occurred during an encounter, and they can file false complaints against law enforcement officers.

Even though the woman did not sustain injuries from the taser, an alternative method that the officer could have used to take her custody, is the use of non-injuring, physical force. Most elderly people have health problems and, if they receive a shock from a taser, they have a high risk of dying from a heart attack. If this old lady had died, as a result of the taser shock, the officer would have been charged with the use of excessive, or even deadly, force. In addition, it appears that the officer was angry with the woman, because she rejected his authority, and he used his taser. Actually, the officer

over-reacted to her uncooperative behavior. A taser must only be used in extreme situations, where a firearm would previously have been used, to prevent officers from using deadly force unnecessarily. It would seem that the use of a taser was not appropriate in this incident, because a 72-year-old woman could easily be taken into custody, by the physically stronger officer.

These incidents show that officers or citizens can lie about what really happened during an encounter, even in the presence of surveillance technology. Furthermore, these incidents show that officers may overreact and may not be able to control themselves, while handling uncooperative and resisting suspects, even in the presence of surveillance technology. Moreover, police departments, or some officers or supervisors, may attempt to protect their delinquent officers, by hiding the videotaped evidence. In addition, the footages recorded by surveillance technology are not reviewed regularly, since only in cases of citizen complaints are they reviewed. This suggests that if the footages are not reviewed regularly, surveillance technology may not improve officers' behavior, while dealing with uncooperative or resisting suspects.

Theoretical Background

Two theories will be used in the current research. Principal-agent theory will be used to predict the behavior of law enforcement officers and routine activity theory will be used to predict the behavior of citizens or suspects during an encounter, in the presence of an in-car or CCTV camera.

Both theories emphasize the weakness of human beings. The weaknesses are in their decision making and implementing those decisions. The results of people being

allowed to choose between bad and good are presented. When there are no control mechanisms or no risk of being caught, people are more likely to cheat, steal, lie, and abuse their power.

Principal-Agent Theory

In the principal-agent relationship, the principal delegates work to the agent and the agent performs that work on behalf of the principal. As part of this relationship, the principal seeks confirmation that the agent is actually doing the work and behaving appropriately (Eisenhardt, 1989) and that the work that was delegated will be done by the agents, as intended.

However, two agency problems exist that may hamper the completion of the delegated work: moral hazard and adverse selection (Eisenhardt, 1989; Shapiro, 2005). Moral hazard means that the agent does not put all of his/her effort toward accomplishing the work but he/she shirks his duty. Adverse selection is the agent's misrepresentation of his/her abilities. During the hiring process, the agent claims that he/she has the needed abilities and skills to accomplish the task, even though he/she does not actually have them. Adverse selection is a problem because the principal cannot be entirely sure that the agent has the abilities and skills that he/she claimed while interviewing for the job and while the agent is performing his/her duties.

The moral hazard problem exists because the principal cannot know what the agent has really done. In other words, these two agency problems exist because of the unobservable behaviors of the agent (Eisenhardt, 1989). If the principal observes the behavior of the agent, it is expected that those two agency problems will be lessened or

eliminated. Hence, the principal installs information systems and monitors the agents in order to prevent these problems (Eisenhardt, 1989; Shapiro, 2005).

In policing, the police chief is the principal and a patrol officer is an agent. The police chief wants to be sure that the officer is actually doing the work and that the officer behaves appropriately. The main work of law enforcement officers is to capture criminals and bring them to justice. Law enforcement agencies are not tasked with punishing criminals. Inappropriate use of force by the officer is inappropriate behavior and it is not in the best interest of the police chief. However, because of various reasons, even though the officer will not gain economically from using inappropriate force, the police chief still wants to be sure that the officer only uses appropriate force.

A monitoring mechanism is necessary to ensure that agents comply with departmental policies. In order to prevent inappropriate behavior by the officer, the police chief employs various control mechanisms. One control mechanism is the installation of information systems that monitor the officer in the work environment. In policing, surveillance cameras can be seen as a tool of both information systems and monitoring mechanisms. The police chief may attempt to control the behavior of the officer via surveillance cameras. This is reasonable because in-car cameras, in particular, monitor the patrol officers everyday. The videotapes, captured by in-car cameras and CCTV, inform the police chief about what the officer is really doing in the field. In other words, to reduce information asymmetry, the police chief collects information about the officer in his/her work environment via the videotapes.

The police chief also monitors the officer's behavior via cameras, while performing the police work that is delegated to the officer by the police chief. It can be expected that monitoring the behavior of officers in their work environment increases appropriate behavior and reduces inappropriate behavior. It would also be expected that each camera used by a police department would increase appropriate behavior and prevent inappropriate behavior by the officer. Principal agent theory predicts that the increasing number of surveillance cameras is related to the decreasing number of citizen complaints about inappropriate use of force by a police department.

Increased supervisory monitoring can be defined as an increased number of cameras in police patrol cars and an increased number of CCTV cameras on street corners in cities. Each additional surveillance camera increases the monitoring effect on the behavior of officers. In addition, each additional surveillance camera increases the risk of being identified as using the behavior of offenders during an encounter. An argument can be made that if officers behave better and comply with departmental policies in the presence of CCTV, they will also be more compliant about videotaping encounters via in-car cameras, whenever possible.

On the other hand, principal agent theory predicts that the usage of surveillance technology may not have an effect on the number of citizen complaints about excessive use of force, for the following reasons:

First, even though officers may comply with departmental policies in the presence of surveillance technology, citizens or suspects may file official unintentional or intentionally false complaints, because their supervisors may not take the time to show

the videotape, containing the incident, to the complainant. In other words, police personnel may not try to resolve the matter informally, at the police department or police station. It may also be that the policy of a police department is to require that all complaints are first recorded and, then, later to dismiss the unintentional or intentionally false complaints. These officially recorded complaints may be dismissed after internal or external investigations, based on the videotape recorded by surveillance technology. In this type of situation, surveillance technology may not reduce the number of force complaints, but may increase the percentage of officially recorded unintentional or intentional force complaints that are dismissed.

Second, the effect of surveillance technology on the behavior of police officers also depends on the risks associated with getting caught and the severity of the punishment, if found guilty. A surveillance camera may not be perceived as a potential risk, which can detect and identify the inappropriate behavior of an officer, during an encounter. For instance, an officer may think, "I put my life into danger; hence, my small mistakes should be forgiven". In addition, the accused officer may believe that he/she will not be convicted, because his/her fellow officers that were previously accused of using excessive force were found innocent, even though the incident was videotaped. It may also be that police supervisors tend to protect their corrupt or brutal officers. Hence, the presence of surveillance technology may not deter officers from acting brutally, because they may believe that they are above the law and are immune to punishment (Skolnick & Fyfe, 1993). In such situations, the number of citizen complaints may actually increase, even though surveillance technology is present.

Third, Crank (2004) argues that the use of inappropriate force indicates “unquestionable authority of the state” (p.107). Police brutality signifies that the police do not tolerate citizens’ inappropriate behavior. It may be difficult for the victims of police brutality to file a complaint, if the police give them trouble in the following days. In addition, the courts will most probably find the brutal officers innocent, because the jury will likely accept the argument that the officers acted appropriately, as they were trained to do, and that they did not violate policy regarding the use of force (Crank, 2004).

In addition, Klockars, Ivkovic, & Haberfeld (2006, p. 199) argue that some citizens may be reluctant to submit complaints to the police, because they may be afraid of or dislike the police, or they may lack confidence in the police. Hence, citizens may not make official complaints, if they believe that a brutal police officer will not be punished, even though a videotape that shows the illegal behavior of the accused officer exists. In such situations, there will be fewer citizen complaints, even though surveillance technology is present. On the other hand, if citizens believe that a brutal officer will be convicted based on videotape evidence, they may be more willing to file official complaints. The number of official complaints may increase in these types of situations.

Fourth, officers that are experienced with using surveillance technology may become habituated to it, and feel that in-car cameras have become a part of them. Eventually, they may not be aware that the cameras exist and are recording. They may also forget that in-car cameras can record their own behavior, when it deviates from organizational police behavior. While overreacting to a suspect’s uncooperative and

disrespectful behavior, their inappropriate behaviors may be videotaped by in-car cameras or CCTV. In these types of situations, surveillance technology may not reduce the number of force complaints, but it may increase the percentage of sustained complaints, based on videotape evidence.

Fifth, most law enforcement agencies do not regularly review the footages captured by in-car cameras or CCTV (S. Kirk, personal communication, August 10, 2009). This suggests that officers' inappropriate behavior will not be detected and police departments will not initiate an investigation automatically, unless citizens file an official complaint. Also, the brutal officers may believe that citizens will not file complaints, even though the incident was videotaped. Hence, if there is no citizen complaint, officers' inappropriate behavior will not be detected, and they will not be convicted. In this situation, the number of force complaints and the percentage of sustained complaints may be increased.

Routine Activity Theory

Routine activity theory explains why people commit crime and how the police deter them from committing crime. According to the theory, in the lack of an interfering force or in the absence of an appropriate guardian or if there is an opportunity, an offender will victimize another individual. If an interfering force is present, it will intervene in the criminal activity and deter an offender from victimizing an individual (Bennett, 1998; Clarke & Felson, 1993; Cohen & Felson, 1979; Foster, 2005). An interfering force increases the potential risk that an offender will be more likely to be identified and convicted (Foster, 2005). In other words, an addition to the risk of being

detected is called an interfering force. An interfering force can be a video camera, a witness who knows the offender, or a nearby law enforcement officer. An offender perceives an interfering force as adding risk to his/her crime (Foster, 2005).

Routine activity theory assumes that an individual has already made the decision to commit a crime and only an external factor or an interfering force can stop him/her from committing the crime. Routine activity theory can also be used to predict the behavior of suspects or citizens during an encounter with an law enforcement officer. The presence of an in-car or a CCTV camera as a control mechanism or interfering force or suitable guardian helps suspects or citizens control their behavior, in an encounter with a police officer. Those cameras can help a suspect make a choice to be less aggressive or not to attack an officer, because of the increased risk of being identified and convicted. In other words, these cameras block opportunities for uncooperative behavior.

The behavior of a regular citizen versus that of an offender can be different during an encounter. While an officer is issuing a citation, a citizen may become angry with the officer. In terms of a regular citizen's behavior, the citizen might think that the officer could give a warning rather than a traffic citation. In addition, the citizen may feel that he/she does not deserve a traffic citation. As a result, he/she may not comply with the legitimate orders of law enforcement officers and may increase the level of tension during an encounter. Under such conditions, this type of behavior from citizens can create a situation that necessitates the use of force by an officer. In such situations, in-car cameras reduce the chances of uncooperative behavior turning into violent behavior against law enforcement officers.

Surveillance cameras help in predicting the behavior of offenders. While an officer is executing an arrest warrant or arresting an offender or transporting an offender in a police car, it is in the best interest of an offender to get out of police custody and escape. While an offender is attempting to escape, an officer uses force to try to stop his/her unlawful behavior and inappropriate force may be used by the officer. However, in-car cameras deter the offender from attempting to escape from police custody so the circumstances may be few to require the police using force. In addition, in cases where offenders complain about the inappropriate use of force by the officer, video records help officials to dismiss the complaint.

It can be predicted that each additional camera that is added as ‘an interfering force’ will reduce the uncooperative behavior of citizens or suspects toward police officers during an encounter. The routine activity theory predicts that the presence of cameras during an encounter increases the cooperativeness of citizens or suspects and decreases their uncooperative behavior, so that no situation for the police to use force arises. If no circumstances arise for the police to use force, police departments should receive few or no citizen complaints about the inappropriate use of force.

The use of CCTV is frequently justified as a crime deterrent (Foster, 2005). It is assumed that if law enforcement officers are aware that they are being videotaped, their behavior will be better. As an extension of this concept, it is assumed that if citizens are aware that there is a CCTV in their neighborhood, offenders will behave better and will not commit crime in the presence of the CCTV. It can be concluded that just the presence of a camera can be enough to motivate people to display better behavior (Foster, 2005).

Because they believe in the deterrent effect of CCTV cameras, some agencies install dummy or nonoperational cameras to reduce their surveillance costs (Foster, 2005).

It can be argued that in the presence of a CCTV, officers will conduct themselves better. On the other hand, when there is no CCTV camera, they may behave badly to offenders. It can be concluded that CCTV cameras can displace the bad behavior of officers as well as that of offenders (Foster, 2005). The presence of CCTV cameras increases officer compliance with departmental policies. Accordingly, in-car cameras can increase officer compliance at all times, because of the monitoring effect on the officers' behavior.

Routine activity theory suggests that the presence of surveillance technology may also affect whether a citizen or a suspect makes the decision to file an official complaint. Surveillance technology may reduce or eliminate the number of false complaints regarding the use of excessive force. Police departments may receive intentional or unintentionally false complaints about the use of excessive force, even though the incident did not occur. When citizens or suspects are aware of the presence of surveillance technology, they may not make an intentionally false complaint. Also, citizens or suspects may not make unintentionally false complaints because, after reviewing the videotape of the incident in the police department (before making the decision to file an official complaint), they may believe that the officer(s) acted appropriately.

On the other hand, routine activity theory predicts that the presence of surveillance technology may not have an effect on the behavior of offenders or citizens,

during an encounter with an officer. If the arrested individuals believe that they will be convicted anyway, it is also possible that they will file official complaints in the presence of surveillance technology, in order to receive compensation from police agencies. In addition, offenders may expect that the charges against them will be reduced, by filing an intentional complaint. Another reason for this may be that offenders want to get revenge for the arrest (Snow, 2007). In such a situation, an offender may go to extreme efforts to make the officer use inappropriate or excessive force, in the presence of surveillance technology. Hence, because of strategic or opportunistic behavior of the part of the offender, in these type of incidents, the number of force complaints may increase, even though surveillance technology is present. In addition, the routine activity theory predicts that, if citizens do not know that an encounter is videotaped, they may not change their behavior.

Hypotheses

It was found that the number of citizen complaints and the total ratio of sustained complaints regarding police misconduct decreased in some state law enforcement agencies after the implementation of an in-car camera program (IACP, 2005). Based on the review of the literature and theories, it can be expected that officers will act more professionally while being videotaped (IACP, 2005). Consequently, it can be expected that the use of in-car cameras will reduce citizen complaints about the inappropriate use of force. Police agencies that use in-car cameras may record fewer citizen complaints about the inappropriate use of force than other police agencies.

The impact of in-car cameras on citizen complaints varies among agencies for several reasons. The first is that, some agencies may have too few cameras to affect the number of citizen complaints. The second is that citizen complaints may decrease because of improved behavior by police officers. The third is that false allegations about police misconduct may decrease, if citizens understand that video records, captured by in-car cameras, provide evidence that cannot be disputed (IACP, 2005).

In the current research, three models will be used. In the first model, the number of citizen complaints is used as a dependent variable. The relevant literature suggests that in-car and CCTV cameras decrease the amount of abuse of power by the police. Thus, the hypotheses are:

H1: Increasing the number of in-car cameras used by each municipal police agency is related to a decreased number of citizen complaints about the inappropriate use of force.

H2: Increasing the number of CCTV cameras used by each municipal police agency is related to a decreased number of citizen complaints about the inappropriate use of force.

The use of in-car and CCTV cameras may affect the incidence of dismissed cases involving the unnecessary use of force. The use of in-car cameras may increase the dismissal rate, since adjudicators evaluate the video record of an incident and recorded evidence may show that officers acted properly and that the complaint was a false allegation, or that the citizen felt that an unnecessary amount of force was used against them by an officer, even though it was not.

Proactive and reactive tools are used by a police agency in order to prevent police misconduct. While the external review of citizen complaints and internal affairs investigations are counted as reactive tools, training, the screening of candidates, and policy adjustments are recognized as proactive tools. In-car cameras can be both proactive and reactive tools, used to prevent police misconduct. As a reactive tool, video evidence, captured by in-car cameras, can facilitate the process used to make a decision about guilt or innocence during internal affairs investigations (IACP, 2005). From this perspective, it can be expected that the use of in-car cameras may increase the number of exonerated and unfounded citizen complaints about the inappropriate use of force, because videotapes may show that officers acted properly.

In the second model, only the numbers of exonerated and unfounded use of force complaints are used as dependent variables. Videotaped evidence, captured by in-car and CCTV cameras, may aid police departments in defending their officers against civil litigations. The relevant literature suggests that videotaped evidence, captured by in-car and CCTV cameras, helps in proving the innocence of officers against false complaints of unprofessional conduct. If there is an intentional or unintentional false allegation, the videotaped evidence provides evidence that the allegation is not based on facts or that the incident did not occur. Hence, the hypotheses are:

H3: Increasing the number of in-car cameras used by each municipal police agency is related to an increased number of exonerated and unfounded use of force complaints.

H4: Increasing the number of CCTV cameras used by each municipal police agency is related to an increased number of exonerated and unfounded use of force complaints.

In the third model, sustained use of force complaints are used to determine whether the use of cameras increases the conviction rate of officers, because the existing videotape evidence helps in proving the officers guilty. Police agencies that use in-car cameras may have more sustained citizen complaints than others, because of the existence of video evidence. Those videotapes can demonstrate that the officer acted improperly.

However, there is little probability that officers will videotape their own illegal or improper behavior. This is why the statements of false witnesses may contribute to convicting officers in the absence of videotaped evidence, captured by in-car or CCTV cameras. Officers may be proven guilty because of the statements of false witnesses. Although patrol officers work alone in their patrol cars, a motorist may have some friends or relatives along with him/her in the car, during a traffic stop. These people may give false statements that support the statement of the motorist. In such circumstances, it may be suggested that videotaped evidence can challenge the testimony of false witnesses. Videotaped evidence may contribute to lessening the number of officers' convictions, because the videotape can clearly show that the officer acted properly. Because of this two-sided argument, it is difficult to predict the direction of the relationship between the existence of videotaped evidence and sustained citizen complaints. Hence, the hypotheses are:

H5: The use of in-car cameras by each municipal police agency affects the number of sustained use of force complaints.

H6: The use of CCTV cameras by each municipal police agency affects the number of sustained use of force complaints.

The usage categories of surveillance technology will be compared. The principal-agent theory predicts that increased supervisory monitoring can reduce inappropriate behavior by police officers. Increased supervisory monitoring includes the use of both in-car and CCTV cameras by a police department. Using both in-car cameras and CCTV increases the effects of monitoring on the officers' behavior. The reason for this is that the two types of surveillance technology increase the potential risk of getting punished, when inappropriate behavior is videotaped. Specifically, officers employed by police departments that have both types of surveillance technology may not violate departmental policies very often, because they may feel that they are under more pressure than those officers from police departments that used only in-car cameras, only CCTV or neither of them. The extensive presence of surveillance technology may result in a situation of joint custody, where officers may always act appropriately.

The routine activity theory predicts that citizens will act more appropriately during an encounter and will not file intentional false complaints, when they are in the jurisdictions of police departments that use both in-car cameras and CCTV, in comparison to citizens or suspects in the jurisdictions of police departments that use only in-car cameras, only CCTV, or neither of them. This is because the potential risk of being

videotaped is higher in the presence of surveillance technology. Hence, the hypotheses are:

H7: Municipal police departments that use in-car cameras, or CCTV or, in particular, both of them, should receive fewer force complaints, in comparison to police departments without surveillance technology in 2003.

H8: Municipal police departments that use in-car cameras, or CCTV or, in particular, both of them, should dismiss more force complaints, in comparison to police departments without surveillance technology in 2003.

H9: Municipal police departments that use in-car cameras, or CCTV or, in particular, both of them, should sustain fewer force complaints, in comparison to police departments without surveillance technology in 2003.

Experience of municipal police departments with use of surveillance technology will be tested. The principal-agent theory predicts that the level of experience that municipal police departments have with using surveillance technology has a negative impact on the number of citizen complaints, because the level of perceived potential risk should be higher, if the level of experience with surveillance technology is increased. The perceived potential risk is the officers' perception that they will be more likely to be convicted, when their inappropriate behavior is videotaped.

In addition, the routine activity theory predicts that the perceived potential risk for citizens' or suspects' will be higher in the jurisdictions of police departments having experience with in-car cameras or CCTV (using CCTV or in-car cameras, both in 2000 and 2003) than in the jurisdictions of police departments that had no experience, or only

limited experience (used only in 2000 or only 2003), with surveillance technology. One of the reasons for this may be that citizens, or suspects, or some of their friends and relatives, might have been convicted previously, based on the videotaped evidence captured by surveillance technology.

H10: Municipal police departments having experience with in-car cameras or CCTV (using CCTV or in-car cameras, both in 2000 and 2003) should receive fewer force complaints than municipal police departments that had no experience, or only limited experience (used only in 2000 or only 2003), with surveillance technology.

H11: Municipal police departments having experience with in-car cameras or CCTV (using CCTV or in-car cameras, both in 2000 and 2003) should dismiss more force complaints than municipal police departments that had no experience, or only limited experience (used only in 2000 or only 2003), with surveillance technology.

H12: Municipal police departments having experience with in-car cameras or CCTV (using CCTV or in-car cameras, both in 2000 and 2003) should sustain fewer force complaints than municipal police departments that had no experience, or only limited experience (used only in 2000 or only 2003), with surveillance technology.

Summary

This current research examines whether in-car cameras and CCTV cameras have an effect on citizen complaints about the inappropriate use of force at the organizational level. CCTV cameras and in-car cameras are two types of surveillance technologies used by law enforcement agencies. These surveillance technologies have been utilized to increase police accountability and as a backup to the criminal justice system because they provide solid evidence of criminal incidents. These technologies have great potential in controlling the conduct of officers and resolving controversial issues in policing.

In this section, we argue that surveillance technology can change the behavior of both citizens in an encounter and in the workplace. Furthermore, we maintain that surveillance technology can resolve disputable situations such as unintentional citizen complaints about inappropriate use of force. As a control mechanism and an information system, those two surveillance technologies have the potential to deter law enforcement officers and citizens from deviant behavior. A citizen complaint about the inappropriate use of force is an indicator of the existence of police brutality and it is considered a kind of police misconduct and police abuse of power. The literature shows that surveillance cameras, particularly in-car cameras, have been expected to prevent, reduce, and eliminate inappropriate use of force by the police.

Some reports such as that of the Christopher Commission, after the Rodney King incident, show that in-car police cameras can be used as a tool to eliminate inappropriate use of force by the police. The principal-agent theory predicts that they will prevent misconduct from officers. In addition, routine activity theory predicts that they will

prevent uncooperative and abusive behavior from citizens. Those two theories will be tested for their effects on predicting the number of citizen complaints about inappropriate use of force. These two theories should predict whether additional surveillance cameras will reduce citizen complaints about inappropriate use of force by the police, and whether each additional camera used by a police agency increases the number of exonerated citizen complaints.

CHAPTER 3

METHODOLOGY

This chapter presents the research design and methodology used to determine whether surveillance technology has an effect on the behavior of law enforcement personnel. Specifically, this chapter describes the source of data used in the analysis of two types of surveillance technologies --(1) In-car camera and (2) Closed-circuit television (CCTV)-- and the impact of these technologies on the number of citizen complaints, the percentage of unfounded or officially exonerated cases (dismissed complaints), and the percentage of sustained cases. The latter category uses data from 2002 concerning official complaints submitted by citizens against law enforcement officers who allegedly used inappropriate force.

According to the principal-agent model, sworn officers are expected to comply with the predetermined rules and regulations in the presence of a surveillance camera. It can be expected that an increase in the number of cameras will increase the compliance rate of police officers with departmental rules and regulations, such as use of force policies. On the other hand, the number of force complaints is expected to decrease as the number of cameras increases. In addition, the number of dismissed complaints is expected to increase and the number of sustained complaints to decrease with an increase in the number of in-car or CCTV cameras. These propositions concerning the impact of surveillance technology are consistent with the current literature (IACP, 2005).

This chapter is organized into three sections. The first section provides a brief description of the source of the data. Based on the LEMAS 2003 dataset, the behavior of law enforcement agency personnel is operationalized as the number of public complaints that were filed against an agency. The next section of this chapter explains the manner in which the total number of in-car cameras and CCTV is derived. The last section describes the operationalization of three major control variables: (1) the organizational structure of municipal police departments, (2) the administrative control mechanisms found in an agency, and (3) the environmental factors. This section also presents the specific hypotheses to be tested.

Research Design

It is a challenge to design a study that captures the impact of surveillance technology on the behavior of personnel in a public agency, especially a law enforcement agency. This is because the outcome of the actions of law enforcement officers, in performing their official duties to protect and uphold public laws, depends on the specific administrative capacity of their organizational culture, making it difficult to isolate the specific impact of surveillance technology. Consequently, the extent to which surveillance technologies have been used by law enforcement agencies to monitor their own officers and, to a larger extent, to protect themselves against unfounded complaints, is difficult to analyze in isolation, without controlling for other factors that influence officer behavior.

This dissertation addresses these concerns by assuming that surveillance technologies, for the most part, are an indicator of the pro-active nature of law

enforcement agencies. At the municipal level, surveillance technology may be viewed as an administrative tool used to enhance a local agency's capacity and avoid unnecessary paper work associated with police reporting. That is, the introduction of surveillance technology can save local agencies' time and effort during the auditing process. This is particularly true for local law enforcement agencies with relatively limited resources.

Data Sources

This research employed secondary data collected by the U.S. government. The Law Enforcement Management and Administrative Statistics (LEMAS)⁵ survey gathers data nationally, every three years, from a representative sample of state and local law enforcement agencies. The data from the LEMAS 2003 survey is available from the website of Inter-University Consortium for Political and Social Research. For the purpose of this study, the dataset that was released in 2006 was used (United States Dept. of Justice, Bureau of Justice Statistics, 2006). The advantage of using this dataset is that it contains information concerning a large number of municipal law enforcement agencies in the U.S., and, in particular, on their personnel, expenditures, payments, operations, community policing activities, equipment, computers, information systems, and written policies.

In the LEMAS dataset, the information is gathered through two types of survey instruments, which are known in the field as the "Long Form" and "Short Form."

Although the technical distinction between the forms is minor, the information from the

⁵ The Bureau of Justice Statistics (BJS) and the Office of Community Oriented Policing Services (COPS) have sponsored Law Enforcement Management and Administrative Statistics (LEMAS) surveys since 1987. LEMAS surveys were done in 1987, 1990, 1993, 1997, 1999, 2000, and 2003.

Long Form was more appropriate for the current research, since it contained a total of 873 cases. There are several methodological reasons for this approach. Firstly, the Long Form, as a survey instrument, contains 62 major questions directly related to the research question. The survey instrument was administered to self-representing agencies⁶. It also includes information such as the number of citizen complaints that a local law enforcement agency received, the number of unfounded or officially exonerated complaints cases, and the number of sustained complaints cases. In contrast, the Short Form was administered to non-self-representing agencies⁷ and does not include information related to citizen complaints or their dispositions.

Secondly, the Long Form captures data regarding the general administrative and organizational characteristics of law enforcement agencies better than the Short Form. Because of the decentralized nature of U.S. municipal governments, the variation in law enforcement agencies is enormous, ranging from the sheriff's office and county police to primary state agencies, regional police, and tribal police (see Table 3.1 for the distribution of law enforcement agencies). Consequently, municipal police departments and their environments differ from each other, in terms of their administrative and organizational policies, as well as, in their personnel compositions⁸. Despite the variations between agencies, the use of the Long Form is appropriate in determining the

⁶ A self-representing agency is defined by the statisticians of the Bureau of Justice Statistics as a law enforcement agency in the U.S. that employs 100 or more sworn officers (The Codebook of LEMAS 2003 dataset).

⁷ A non-self-representing agency is defined as a law enforcement agency in the U.S. that employs fewer than 100 sworn officers (The Codebook of LEMAS 2003 dataset).

⁸ For instance, some local police departments require an associate's degree for recruitment, while others only require a high school diploma. Some cities have citizen complaint review boards while others do not.

degree or magnitude of citizen complaints and the number of sustained or dismissed disposition cases, because it contains data gathered from relatively large municipal police departments (that employ 100 or more sworn officers), which generally have similar organizational cultures.

Table 3.1

Frequency Distribution of Law Enforcement Agencies (Long Form from LEMAS 2003)

Law Enforcement Agency Type	“Long Form” Survey Instrument: Number of Law Enforcement Agencies
Sheriff’s office	278 (31.8)
County police	33 (3.8)
Municipal police	511* (58.5)
Primary state agency	49 (5.6)
Tribal police	2 (.2)
Regional police	-
TOTAL	873 (100)

Source: LEMAS (2003)

Note. Percentages in the parentheses

* M.Hickman found a recording error and deleted one case from analysis. Hence, 510 cases are used in this research.

Table 3.1, summarizes the distribution of law enforcement agencies in the LEMAS 2003 dataset. There are 873 law enforcement agencies. According to Table 3.1, more than half of the law enforcement agencies fall under the category of municipal police departments (i.e., 58.5%), suggesting that, in general, municipal law enforcement agencies employ more sworn officers, as a single entity, than the other types of law enforcement agencies. Furthermore, Sheriff’s Offices only comprised 31.8% of law enforcement agencies, followed by state agencies (i.e., 5.6%), and county police (i.e.,

3.8%). Note that Table 3.1 only includes law enforcement agencies that have 100 or more full-time sworn officers.

Municipal Police Departments

While there are some advantages of using the information in the LEMAS dataset (LEMAS, 2003), there are also some weaknesses. For instance, the type of law enforcement agencies responding to the Long Form may present a potential sample selection bias, since only data from relatively large law enforcement agencies is captured (i.e., those employing 100 or more sworn officers). This problem is inherent to the dataset and there is no obvious way around it, but one approach is to analyze the dataset by focusing only on municipal police departments. Despite this potential problem, I contend that the use of this dataset is appropriate, since the majority of police personnel are employed by municipal police departments and the data from these police departments is more accurate and impersonal (Cao, Deng, & Barton, 2000).

Methodologically and substantively, the decision to select the municipal police department as the unit of analysis is motivated by the following reasons. First, based on the LEMAS 2003 dataset, law enforcement agencies at the municipal level make up more than half of the total responders (i.e., 58.5%). According to Hickman & Piquero (2009), although there are only about 511 municipal police departments in the dataset (4% of all police departments in the U.S.), they actually serve about 32% of the metropolitan population in the U.S., and respond to about 60% of the violent crimes, rendering them “a substantial and important segment of policing in the U.S.” (Hickman & Piquero, 2009, p. 9)

Second, most citizens interact with municipal police officers and, because of the decentralized nature of the American police system, the local police agencies generally receive most of the citizen complaints (Langworthy & Travis, 1994). As was pointed out by Pate and Fridell (1993), most citizens file their complaints against municipal police departments rather than other law enforcement agencies, because they have more contact with municipal police officers. Although some smaller law enforcement agencies may also receive public complaints, larger municipal police departments tend to bear the burden of such complaints, making the use of data from municipal police departments with at least 100 officers the basis for evaluating the research questions of this study a reasonable choice.

For instance, according to the LEMAS 2003 dataset, large state and local law enforcement agencies which employ 59% of the U.S.'s sworn officers, received 26,556 citizen complaints about inappropriate use of force in 2002. Out of the total, about 84% of the complaints were received by large municipal police departments (Hickman, 2006). Furthermore, for substantive reasons, the number of citizen complaints about inappropriate use of force was reported only from the LEMAS 2003 survey and from law enforcement agencies that have 100, or more, full-time sworn officers (Hickman, 2006).

In summary, self-representing municipal police departments are used in this research because of data availability, the large number of citizen complaints they received, the large percentage of violent crimes that they responded to, and the fact that they employ the majority of sworn municipal officers.

Model Specification

My model specification borrows heavily from Hickman & Piquero (2009). Their model has two major dependent variables: the rate of citizen complaints about police use of force per 100 full-time sworn officers, and the rate of complaints that are officially sustained. They also included a variety of explanatory factors, which are summarized as: organizational structure, administrative procedures or policies, and environmental factors. While Hickman & Piquero's (2009) study is insightful, their results need to be reviewed with caution. In particular, their descriptive statistics suggest that both of their dependent variables are highly skewed, i.e., the "complaints rate" variable has $M = 6.01$, $SD = 8.57$; while the "percentage sustained" variable has $M = 5.99$, $SD = 13.47$. Without correcting for the skewness in the frequency distribution of the dependent variables, these results could lead to a wrong conclusion about the effect of the independent variables. This model also seriously violates the ordinary least square (OLS) assumptions of heteroskedasticity, leading to biased coefficient estimates.

My model specification differs from Hickman & Piquero's (2009) in the following ways. I propose a different approach to remedy the potential problems of bias estimation of the partial slope coefficients. In particular, my model specification includes log-log regression and semi-log regression models. The effect of surveillance technologies on the behavior of municipal police departments is also included to improve my model specification, which Hickman & Piquero failed to take into account in their previous study. There are a few similarities between both models. I will apply both Hickman & Piquero's dependent variables, and also include the minority representation

ratio as a control variable. To take into account the effect of crime rate on the behavior of municipal police departments, the cities' crime rate was introduced. To account for local economic conditions, the percentage of owner-occupied households and the percentage of minorities for each city are included. My model specifications are summarized as follows:

$$\text{Model 1: } Y = \alpha + b_1 X_1 + b_j K_j + e \quad \text{OLS Model}$$

$$\text{Model 2: } \ln(Y) = \alpha + b_1 X_1 + b_j K_j + e \quad \text{Semi-log Model}$$

$$\text{Model 3: } \text{Logit}(Y^*=1|X) = \alpha + b_1 X_1 + b_j K_j + e \quad \text{Logistic Model}$$

Y is three dependent variables: (1) the number of citizen complaints per 100 officers, (2) the percentage of dismissed and (3) the percentage of sustained complaints. X is the surveillance technology variables, i.e. in-car cameras and CCTV. K is a vector of control variables, and e is the error term.

Operationalization of the Variables

Dependent Variable: Behaviors of Municipal Police Departments

The behavior of municipal police departments is operationalized as their compliance with the norms of professional police conduct (i.e., they do not use excessive force). Citizen complaints are a good indicator of a municipal police department's behavior, because official complaints can be considered as general feedback about the quality of police services (Weitzer, 2005). If there are a large number of official complaints, for example, this would indicate that municipal police departments, and the types of services they perform, are not responsive to the needs of the local communities.

Furthermore, the number of complaints can provide some measure of the quality of police-public interactions and the extent to which police chief executives have made an effort to resolve, or at least minimize, the internal administrative and personnel problems within their organizations (Brandl, Frank, Worden, & Bynum, 1994).

Citizen complaints were interpreted by Klockars, Ivkovic, & Haberfeld (2006) in the following ways. First, they can be an indicator of citizen trust in the police force. Second, they may be an indicator of the level of police misconduct that is occurring. Third, they may measure the level of police democratization. Fourth, they can be a source of learning for police agencies. Finally, they may be a measure of a police agency's commitment to fight against police misconduct and abuse of power.

The operationalization of municipal police departments' behaviors are recorded in the following variables: (1) the rate of citizen complaints, (2) the percentage of unfounded or officially exonerated complaints cases (dismissed complaints), and (3) the percentage of officially sustained complaints. In the LEMAS 2003 dataset, there are seven items that record inappropriate use of force complaints. These items include the total number of complaints, the number of unfounded complaints, the number of exonerated complaints, the number of unsustained complaints, the number of sustained complaints, the number of pending cases, and other types of dispositions. The main survey question recording each of these items asks law enforcement agencies to "Enter the current dispositions for formal citizen complaints received during 2002 regarding use of force. If none, enter '0'." Other scholars have also used the same survey instruments

with the same definitions, to create the same survey variables (Hickman & Piquero, 2009; Pate & Fridell, 1993).

To record the behavior of municipal police departments, I relied on the definition of each item provided by the LEMAS codebook. They are considered to be proxies for the behaviors of municipal police departments, since they indicate the outcomes or commitments of law enforcement agencies in tackling or preventing the excessive use of force and unfounded complaints made by the public (Klockars et al., 1997). For the purpose of this dissertation, only three variables were developed from these items, and they are discussed in further detail below.

Rate of Citizen Complaints

The rate of citizen complaints is measured as the number of inappropriate use of force complaints per 100 full-time sworn officers. A per officer rate is utilized to standardize the volume of yearly citizen complaints recorded by law enforcement agencies (Hickman & Piquero, 2009). This is calculated by dividing the total number of inappropriate use of force complaints by the total number of sworn officers and multiplying that number by 100. The total use of force complaints is defined as the “total use of force complaints received” by municipal police departments in 2002. For example, the rate of citizen complaints for the Colorado Springs Police Department was 90.70 complaints per 100 officers. This police department had the highest rate of citizen complaints in the dataset. A higher rate of citizen complaints suggests that there is a tendency for that municipal police force to act against the norms of professional codes of conduct.

Percentage of Complaints Being Dismissed

Technically, the survey item for unfounded use of force complaints is defined as “the complaint was not based on facts, or reported incident did not occur,” while the item for the exonerated use of force complaints is defined as “the incident occurred, but officer action was deemed lawful and proper” (LEMAS, 2003). The percentage of dismissed complaints received by a municipal police department is derived from these two survey items. The number of exonerated and unfounded citizen complaint cases is first added, then this number is divided by the total number of use of force complaints and multiplied by 100. Firstly, a high percentage of dismissed complaints recorded from an agency, suggests that surveillance technology helped internal investigators or juries to find officers innocent of charges. Secondly, a high percentage of dismissed complaints, alone, may suggest that citizens file many false complaints. Thirdly, it may be an indicator that police departments do not investigate citizen complaints in sufficient depth. Fourthly, it may indicate that police officers are doing the job they were trained to do. In other words, sworn officers use force appropriately when making arrests.

The items “unfounded” and “exonerated” complaints have been combined into one category, which I refer to as “dismissed” complaints. The rationale for this is that surveillance technology influences citizens’ decisions regarding whether to file official complaints. Because I assume that surveillance technology will help internal investigators or juries to make appropriate decisions, a false complaint will be dismissed and vice versa. For instance, when a citizen files a complaint against an officer, the videotape captured by in-car or CCTV cameras will show whether that the officer’s behavior was

appropriate or not. The complaint's disposition will be reported as "an unfounded complaint" if the behavior was deemed as appropriate. If that complaint progresses through internal and external appeals and is ultimately dismissed, the complaint's disposition will be reported as "an exonerated complaint" by the police department.

Percentage of Sustained Complaints

The percentage of use of force complaints that are officially sustained is calculated by dividing the number of sustained force complaints by the total number of force complaints, and then multiplying that number by 100. The 'sustained citizen complaint' is defined as "sufficient evidence to justify disciplinary action against the officer(s)" (LEMAS, 2003). Consider the examples of Barnstable, Appleton, and Cape Coral Police Departments, which have the highest percentages of sustained complaints in the data set. These three police departments each received one citizen complaint, in 2002, and the complaint was sustained. Even though these police departments had a sustained complaint rate of 100%, they only received and sustained one citizen complaint each.

On the other hand, the Houston Police Department (Texas) had the lowest percentage of sustained complaints, of .43. Although this department received 230 force complaints, it sustained only one of them. The dataset revealed that the Houston Police Department used 11 in-car cameras and did not use CCTV, in 2003. Even though it is one of the largest municipal police departments in the U.S., the sustained complaint may be a result of fewer in-car cameras that may not improve or control the behavior of the sworn officers. Even though a higher percentage of sustained complaints should be taken seriously by police agencies, fewer in-car cameras in comparison to the number of sworn

officers or to the number of marked police cars may not be an indicator of the importance that police departments attach to using in-car cameras for upholding police accountability. In addition, the percentage of sustained complaints may be used as an indicator of strong evidence against an officer. In the presence of strong evidence, such as a videotape of a police brutality incident, police administrators or juries will likely convict the accused officer.

The frequency distribution of the percentage of citizen complaints, both dismissed and sustained, is presented below in Table 3.2 and reveals an interesting pattern. Only 6.8% of municipal police departments reported that they did not receive any official citizen complaints about the inappropriate use of force (Table 3.2). In addition, about 85.1% of municipal police departments actually dismissed citizen complaints, suggesting that, in most cases, there is not sufficient evidence to support citizen complaints. For the most part, local police officers were found innocent of charges, in 2003. Only a small percentage (about 15%) of municipal police departments reported that they had sustained citizen complaints (36.2%).

An examination of Table 3.2 also reveals that 180 municipal police departments sustained at least one citizen complaint for use of excessive force. On the other hand, a large percentage of municipal police departments (i.e., 63.8%) reported no sustained complaints. In fact, more citizen complaints were being dismissed than sustained, in 2002 (Table 3.2). Although most municipal police departments (85.1%) have received at least one citizen complaint for the inappropriate use of force, this is not a surprise. It is not

uncommon for large police agencies to receive citizen complaints (Hickman & Piquero, 2009; Langworthy & Travis, 1994).

Table 3.2

Operationalizing Municipal Police Department Behaviors: Frequency of Citizen Complaints and Dispositions (n = 497)

Citizen Complaints and Their Dispositions	Incidence of Citizen Complaints		Total
	Yes	No	
Citizen complaints	463 (93.2)	34 (6.8)	497 (100)
Dismissed complaints	423 (85.1)	73 (14.7)	497 (100)
Sustained complaints	180 (36.2)	317 (63.8)	497 (100)

Note. Percentages in the parentheses

Independent Variables: Surveillance Technology

The main independent variable used in this study is the presence and number of surveillance cameras in municipal police departments. This study specifically uses: (1) in-car cameras and (2) closed-circuit television (CCTV) cameras.

An in-car camera is a video camera operated by law enforcement personnel in their patrol cars. Officers are required to use in-car cameras to document any encounters with the public. This technology produces a videotape of encounters that occur in front of the patrol car. Specifically, the videotaping of traffic stops is the main intended use of in-car cameras (IACP, 2005; Maghan, O'Reilly, & Shon, 2002), but they may also record encounters between a citizen(s) and a law enforcement officer(s). An audio recording

may be made during an encounter, even if an encounter happens outside the range of an in-car camera, by the wireless microphone on the uniform of an officer. The recording of an in-car camera is triggered by switching on the sirens and emergency lights, by cruising at a speed of 90 miles per hour, or at the discretion of an officer, via pushing the record button on the transmitter attached to an officer's belt or in the patrol car (S. Kirk, personal communication, September 17, 2009).

On the other hand, CCTV is a fixed-site surveillance video camera operated by law enforcement agencies in areas under their authority. It is used, for the most part, to monitor and videotape densely populated places or high-crime areas in cities. The camera operators, in the control room of a law enforcement agency, document the behavior of the public, while walking on the street, or of police officers, while patrolling. Given the advances in the current technology, the operator can zoom in on an individual walking down a street. These cameras can also be controlled remotely. Even though the main intended use of CCTV in policing is to videotape criminals and their behavior, CCTV cameras can also videotape law enforcement officers' behavior on the street, while they are responding to emergency calls or patrolling.

In the LEMAS 2003 dataset, information on both types of cameras is requested in the following question: "During the 12-month period ending June 30, 2003, did your agency operate video cameras on a regular basis?" This question also includes a sub-section, in which responders can skip to the next question, if they have used video cameras on a regular basis. Respondents were asked to report the total number of these cameras that were operated by their agencies, as of June 30, 2003. The sub-section of the

question requests that respondents enter the number of in-car cameras, CCTV cameras, mobile surveillance cameras, and traffic enforcement cameras. For the purpose of this dissertation, only the numbers of in-car and CCTV cameras were used in the analysis. This is an appropriate approach, since the main objective of using mobile, or traffic enforcement, cameras is to videotape speeding cars. They are not intended to be used for videotaping an encounter between an officer and citizen(s). In addition, the LEMAS 2003 dataset suggests that only a few mobile and traffic enforcement cameras are used by municipal police departments. Even if these technologies are able to record a few use-of-force complaints, they are expected to have little impact on the behavior of police departments.

However, after further study of the dataset, particularly on the usage of in-car and CCTV cameras, it was apparent that about a third of the total responding agencies (i.e., 29.6%) did not operate these surveillance technologies. Consequently, these agencies would not have responded to the sub-section of the question (i.e., on the total number of the surveillance cameras). To resolve this technical problem, if respondents indicated that they had not employed any of the surveillance technologies, their responses were coded as if they did not have any cameras. In order to ensure the validity of this approach, the LEMAS 2000 dataset is used for comparison. For example, a comparison of the LEMAS 2000 and LEMAS 2003 datasets among municipal police departments, suggests that a third of the missing cases are not actually “missing” per se, but rather, they indicate a non-usage of the surveillance technologies. In other words, the municipal police

departments that did not employ surveillance cameras in 2000, for the most part, also indicated that they did not employ surveillance cameras in 2003.

The frequency distribution of municipal police departments having in-car cameras and CCTV is provided in Table 3.3. An analysis of the survey data suggests that municipal police departments generally employed in-car cameras as the main surveillance technology (i.e., 52%), in comparison to CCTV (i.e., 28.8%). The average number of in-car cameras is 31.27, with a standard deviation of 54.0, while the mean for CCTV is 13.84, with a standard deviation of 167.12. The maximum number of in-car cameras that were used by municipal police departments was 512. The maximum number of CCTV cameras used was 3,160. This analysis suggests that the distributions of surveillance technologies are positively skewed. The approach used to resolve this problem is discussed in the next chapter.

Table 3.3

Municipal Police Departments Having Surveillance Cameras (Frequency, 2003)

	Use of Surveillance Cameras by Municipal Police Departments			
	Yes	No	Mean	SD
In-car cameras (n = 510)	265 (52.0)	244 (47.8)	31.27	54.09
CCTV (n = 510)	147 (28.8)	362 (71)	13.84	167.12

Note. There is one missing case; percentages in the parentheses

Control Variables: Organizational Structure, Administrative Controls, and Environmental Characteristics

As in Hickman & Piquero (2009), three main factors —organizational structure, administrative controls, and environmental factors—are used to determine whether they have an impact on the behavior of municipal police departments. This is important because the relationship between surveillance technology and force complaints and dispositions may be statistically significant. The introduction of these control variables may remove any spurious relationships and may lead to unbiased results.

Organizational Structure

As a theoretical concept, the organizational structure of an agency is important because it influences the extent to which local agencies can respond to the demands of the public. The concept is closely related to the size or structure of police agencies. Blau (1970) theorizes that greater organizational size is related to greater structural differentiation. In theory, large agencies should receive more inappropriate use of force complaints because they have more sworn officers that respond to more violent crime, while serving a larger population. The organizational structure concept is operationalized according to the following variables: (1) spatial differentiation, (2) occupational differentiation, (3) hierarchical differentiation, (3) functional differentiation, and (4) formalization.

(1) “Spatial differentiation” is closely related to organizational size and is operationalized as the number of district, precinct, or division stations. These stations are separate from the headquarters, and a greater number of them indicates a greater spatial

differentiation from the headquarters. Greater spatial differentiation can be predicted to be associated with more inappropriate use of force complaints. These police stations may receive greater numbers of use-of-force complaints because they are more accessible to citizens. Spatial differentiation is operationalized as the number of district, precinct, and division stations that are separate from the headquarters of a police department. On the other hand, some complaints may be resolved informally in police stations, which can actually reduce the number of force complaints. Hence, a higher number of complaints may lead to a higher percentage of dismissed or sustained complaints and a lower number of complaints may lead to lower percentages of dismissed or sustained complaints.

(2) “Occupational differentiation” refers to certain characteristics of organizational personnel and is operationalized as the percentage of the total number of employees in a police agency that are non-sworn employees. In the dataset, there are three variables concerning non-sworn employees. These three variables are: the number of officers without general arrest powers, such as jail or court officers in some agencies, the number of non-sworn officers, and the number of non-sworn reserve or auxiliary officers. All full-time and part-time non-sworn officers are included in this category. These variables were added together and divided by the total number of all employees in a municipal police department. Larger percentages of non-sworn officers are associated with greater occupational differentiation and greater occupational differentiation may be related to greater numbers of use of force complaints. This may also be related to greater percentages of dismissed and sustained complaints. On the other hand, a large percentage of non-sworn personnel may be related to a lower number of force complaints, and a

lower percentage of dismissed and sustained complaints, because inappropriate force can only be used by sworn officers (Hickman & Piquero, 2009).

(3) “Hierarchical differentiation” is closely associated with monetary incentives, and is operationalized as the ratio of the base salary for the chief executive to the base salary for entry-level sworn officers. The survey data provides minimum and maximum values for the base annual salaries of the chief executive and entry-level sworn officers. The minimum and maximum values are added and divided by two, to obtain the mean annual salaries for the chief executive and entry-level sworn officers. The mean annual salary of the chief executive is, then, divided by the mean annual salary of entry-level sworn officers to obtain a ratio. A proportion of higher value indicates a greater vertical hierarchy within the agency, suggesting that the department has a large number of sworn officers and serves a large population. Hence, greater hierarchical differentiation may be related to a large number of force complaints, and a large percentage of dismissed and sustained complaints.

(4) “Functional differentiation” is related to the level of specialization in an organization, which is operationalized as the number of special units within a police agency. There are 21 different types of special units, which are summed as an interval measurement. Greater values for this variable indicate a greater functional differentiation and a greater functional differentiation is associated with a greater organizational size. It indicates that a police department serves a large population, responds to a large number of violent crimes, and has more sworn officers. A greater functional differentiation may

be associated with more force complaints and a larger percentage of dismissed and sustained complaints.

(5) “Formalization” refers to the extent to which departments have formalized their administrative procedures. This is operationalized as the total number of officially written policies in a police department. There are 15 different types of written policies listed in the LEMAS 2003 data set; in this research, their sum represents the level of formalization that has occurred in the organization. The higher the value, the greater the tendency for formalization, and a greater degree of formalization may be related to more use of force complaints. Having more written policies may also indicate that a police department serves a large population and has more sworn officers, which may, in turn, lead to more force complaints.

On the other hand, having a greater degree of formalization may decrease the number of force complaints. Policies which define and guide organizational behavior may promote the display of appropriate behavior by officers in the work environment. Having clear definitions and instructions in regard to appropriate conduct, officers may frequently choose not to use inappropriate force. In addition, greater formalization may be associated with a greater number of sustained complaints, because written policies may help investigators or juries to make decisions based on whether an officer complied with it.

Administrative Controls

The concept of administrative controls is not new to the principal-agent approach. This is because effective control mechanisms generally lead to a higher degree of

compliance. This concept is recorded in this study as: the presence of an internal affairs unit in an organization, having a performance monitoring system, maintaining a separate investigation policy, maintaining a citizen administrative appeal, and allowing the process of collective bargaining.

(1) The presence of an “internal affairs unit” in a municipal police department is coded as a dichotomous variable. The literature suggests that police agencies with an internal affairs unit have more use of force complaints, because the presence of this unit in a police department indicates that citizen complaints are received, processed, and investigated according to more formal policies and procedures (Hickman & Piquero, 2009; Worrall, 2002).

(2) The presence of a “performance monitoring system” in a municipal police department is coded as a dichotomous variable. The purpose of this computer-based personnel-performance-monitoring or assessment system (such as an early warning or early intervention system) in a police agency is to monitor and respond to behavior patterns of officers before they become problematic. Removing a problematic officer from the line of duty may decrease the number of force complaints and, in turn, the fewer number of force complaints may lead to a lower percentage of dismissed and sustained complaints. Conversely, it may also be associated with a higher percentage of sustained complaints, because records containing information about the backgrounds of problematic officers may help investigators or juries to convict the officer.

(3) Maintaining a “separate investigation policy” in a municipal police department is coded as a dichotomous variable. This variable signifies whether an agency has a

written policy requiring a separate investigation outside the chain of command for citizen complaints about the use of inappropriate force. This variable is coded as a 1, if the policy is present, otherwise it is coded as a 0. A policy that requires separate investigations can increase citizen trust in the process and transparency of complaint investigations. It can be expected that municipal police departments that have this policy in place will record more use of force complaints than those that do not. Furthermore, the increased number of complaints may lead to a greater percentage of sustained and dismissed complaints.

(4) The presence of a “citizen administrative appeal” is coded as a dichotomous variable. This variable indicates whether citizens have the right to an administrative appeal when their complaints are dismissed, especially in cases regarding the inappropriate use of force. Offering citizens an opportunity to request a review of administrative decision making creates greater transparency in the process of investigating complaints. Hence, the presence of a citizen administrative appeal is an indication of a police department’s commitment to professionalism (Hickman & Piquero, 2009). It can be expected that municipal police departments having citizen administrative appeal procedures will record more use of force complaints than those without them.

(5) The presence of “collective bargaining” agreements denotes the importance of police officers having the ability to negotiate their rights as employees. Collective bargaining agreements can provide an aggressive defense for an accused officer. Hence, police agencies that provide collective bargaining for their sworn officers may have fewer sustained, but more dismissed complaints than other agencies. This variable is

operationalized as a dummy variable that indicates whether collective bargaining is authorized by an agency.

Environmental Factors

According to Hickman & Piquero (2009), environmental variables are important factors to consider, because they may automatically increase or decrease the number of force complaints by giving citizens greater access to the complaint process. In addition, employing a larger number of sworn officers, having a greater rate of crime in their area of authority, and serving a larger population may increase the number of force complaints that a police agency receives, since these factors increase the number of interactions between citizens and sworn officers. This concept is operationalized by the following variables: having a civilian complaint review board, the municipalities' average violent crime rate for 2000, 2001, and 2002, the percentage of owner-occupied households in a municipality, the number of sworn officers per 10,000 residents, and the minority representation ratio in the police department.

(1) The presence of a "civilian complaint review board" in a municipal police department is coded as a dichotomous variable. As was discussed previously, the presence of a review board affects the behavior of law enforcement agencies, since it facilitates access to the complaint process. As such, it is expected to increase the number of use of force complaints (Cao, Deng, & Barton, 2000; Hickman, 2006; Worrall, 2002).

(2) The events that occur in violence-producing situations may provide a trigger for police brutality. When suspects try to outrun and hide from an approaching police officer, they are more vulnerable to police brutality (Crank, 2004). The "violent crime

rate” is another important factor to consider in the use of inappropriate force by the police, when responding to violent crime incidents. A higher rate of violent crime would likely be associated with more citizen complaints about the inappropriate use of force. This variable is operationalized as the three-year average violent crime rate (2000, 2001, and 2002) per 10,000 citizens for each of the municipal police departments in the sample⁹. The violent crime rate for each city was obtained from the FBI’s Uniform Crime Reports. Large numbers of citizen complaints may lead to an increase in the percentage of dismissed and sustained complaints.

(3) The socio-economic characteristics of local communities also matter. This variable is operationalized as the percentage of “owner-occupied households” per municipality, in 2000, which was obtained directly from the website of the U.S. Census Bureau¹⁰. The percentage of homeownership in a city is an indicator of neighborhood stability, and it can be expected that a greater percentage of owner-occupied households will be associated with fewer use of force complaints. Because home-owners are often more familiar with their neighbors, less violent crime tends to occur in these neighborhoods, and having less violent crime in an area is associated with fewer use of force complaints (Hickman & Piquero, 2009). In addition, fewer use of force complaints may lead to a smaller percentage of dismissed and sustained complaints.

⁹ This was a three-year average of the VCR (violent crime rate), as used by the LLEBG (Local Law Enforcement Block Grant Program) and administered by the BJA (Bureau of Justice Assistance). The data were from the 2003 LLEBG program and collected during 2000, 2001, and 2002. The LLEBG program may not report data from consecutive years; if an agency did not report data for a given year, the next most recent available data is used by the agency to compute a 3-year average. For example, if an agency didn't report data for 2001, then the LLEBG program would use data from 1999, 2000, and 2002 to compute the average (M. Hickman, personal communication, August 20, 2009).

¹⁰ <http://www.census.gov/>

(4) Another factor that assesses a police department's organizational capacity is the number of "sworn officers" per 10,000 residents. Since the inappropriate use of force may only be applied by sworn officers, the number of sworn officers must be controlled for in the model. Police departments that employ more sworn officers may receive a greater number of citizen complaints, in comparison to police departments that employ fewer sworn officers. This variable is operationalized as the number of full-time sworn officers per 10,000 residents. This is calculated by dividing the population of a municipality by 10,000 and, then, dividing the total number of sworn officers by this number. A greater value for this variable may be associated with a higher number of force complaints. Hickman & Piquero (2009) found that a large number of sworn officers per 10,000 residents had a significant negative association with the percentage of sustained complaints.

(5) To account for social characteristics, the minority representation ratio was used; this is operationalized as an interval-ratio variable. The theory of representative bureaucracy suggests that passive representation leads to active representation (Mosher, 1968). Specifically, increasing the number of sworn officers from minority groups may be associated with a decrease in the number of force complaints. Citizen complaints may be higher in cities with police officers who do not mirror the ethnic makeup of the population they serve (Hickman & Piquero, 2009). Scholars have argued that larger numbers of officers representing minority groups in a municipal police department have a negative impact on the number of citizen force complaints.

For instance, the previous literature suggests that as the number of sworn officers from minority populations approaches the percentage of minority populations in cities, use of force complaints are less likely to be filed (Cao, Deng, & Barton, 2000; Cao & Huang, 2000; Hickman & Piquero, 2009; Worrall, 2002). However, in terms of the number of force complaints, Worrall (2002) and Hickman & Piquero (2009) found no association between the minority representation and force complaints, but Cao, Deng, & Barton (2000) found a positive significant association between the percentage of black officers and the number of force complaints.

The minority representation ratio is calculated by dividing the percentage of sworn officers in an agency who are members of a minority group by the percentage of that minority group in the overall population. The percentage of the population for each minority group, in a city, was obtained from the website of the U.S. Census Bureau. The total number of sworn officers who were from a minority group was divided by the total number of sworn officers in a police agency, and this number was divided by the percentage of each minority group in the population of a city.

For ease of referral, Table 3.4 summarizes the relationships between the dependent and independent variables. In addition, variable definitions and data descriptions are presented in Table 3.5.

The following chapter further evaluates the LEMAS (2003) dataset and discusses the methods used to resolve some of the methodological problems caused by missing data and distribution skewness.

Table 3.4

Predicted Outcomes of the Associations

	Predicted Outcome		
	Complaint Rate	Dismissed complaints	Sustained complaints
Surveillance Technology			
In-car camera rate	Negative	Positive	Negative
CCTV camera rate	Negative	Positive	Negative
Organizational			
Spatial differentiation	Indeterminate	Indeterminate	Indeterminate
Occupational differentiation	Indeterminate	Indeterminate	Indeterminate
Hierarchical differentiation	Positive	Positive	Positive
Functional differentiation	Positive	Positive	Positive
Formalization	Indeterminate	Indeterminate	Positive
Administrative			
Internal affairs unit	Positive	Indeterminate	Positive
Performance monitoring system	Negative	Negative	Indeterminate
Separate investigation policy	Positive	Positive	Positive
Citizen administrative appeal	Positive	Negative	Positive
Collective Bargaining	Indeterminate	Positive	Negative
Environmental			
Civilian complaint review board	Positive	Indeterminate	Indeterminate
Violent crime rate	Positive	Positive	Positive
Owner-occupied households (%)	Negative	Negative	Negative
Sworn officers	Positive	Indeterminate	Negative
Minority representation ratio	Indeterminate	Indeterminate	Indeterminate

Table 3.5

Variable Definitions and Data Descriptions

Variables	Descriptions	Measurement Type
Surveillance Camera		
In-car camera only	Police departments used only in-car cameras in 2003	Dummy
CCTV only	Police departments used only CCTV in 2003	Dummy
In-car and CCTV	Police departments used both in-car cameras and CCTV in 2003	Dummy
Experience (In-car Cameras)		
In-car camera (2000)	Police departments used in-car cameras in 2000, but not in 2003	Dummy
In-car camera (2003)	Police departments used in-car cameras in 2003, but not in 2000	Dummy
In-car camera (2000 and 2003)	Police departments used in-car cameras, both in 2000 and 2003	Dummy
Experience (CCTV)		
CCTV (2000)	Police departments used CCTV in 2000, but not in 2003	Dummy
CCTV (2003)	Police departments used CCTV in 2003, but not in 2000	Dummy
CCTV (2000 and 2003)	Police departments used CCTV, both in 2000 and 2003	Dummy
Organizational		
Spatial differentiation	<p>“Enter the number of facilities or sites, separate from headquarters, operated by your agency as of June 30, 2003.”</p> <p>This variable is measured as municipal police departments that have two or more district, precinct, and division stations separate from Headquarters and is coded as 1; otherwise 0</p>	Dummy
Occupational differentiation (%)	Percentage of non-sworn employees in a police department	Interval
Hierarchical differentiation	Proportion of entry-level officer’s salary to chief’s salary in a police department	Interval
Functional differentiation	The number of special units within a police department	Interval
Formalization	The total number of officially written polices in a police department	Interval

Table 3.5 (continued).

Variables	Descriptions	Measurement Type
Administrative		
Internal affairs unit	Presence of internal affairs unit in a police department Coded as 1, if present, otherwise 0	Dummy
Performance monitoring system	“Does your agency have a currently operational computer-based personnel performance monitoring/assessment system (e.g., early warning or early intervention system) for monitoring or responding to officer behavior patterns before they become problematic?” Coded as 1, if present, otherwise 0	Dummy
Separate investigation policy	“Does your agency have a written policy requiring that citizen complaints about inappropriate use of force receive separate investigation outside the chain of command where the accused officer is assigned?” Coded as 1, if present, otherwise 0	Dummy
Citizen administrative appeal	“Do citizens have the right to administrative appeal in cases involving the inappropriate use of force?” Coded as 1, if present, otherwise 0	Dummy
Collective bargaining	“Is collective bargaining authorized for your agency’s sworn employees?” Coded as 1, if present, otherwise 0	Dummy
Environmental		
Citizen complaint review board	“Is there a civilian review board/agency in your jurisdiction that is employed to review use of force complaints against officers in your agency?” Coded as 1, if present, otherwise 0	Dummy
Violent crime rate	3 year (2000, 2001, 2002) average violent crime rate per 10,000 citizens (from Uniform Crime Reports on FBI Website)	Interval
Owner-occupied households (%)	Percentage of owner-occupied households (from U.S. Census Bureau)	Interval
Sworn officers per 10,000 citizens	Number of sworn officers per 10,000 Citizens	Interval
Minority representation ratio	Percentage of sworn officers are divided by percentage of minority population in cities The percentages of minority population in cities are taken from the U.S. census.	Interval

CHAPTER 4

DATA ANALYSIS AND DIAGNOSTIC TESTS

This chapter verifies the accuracy of data entry and examines the problems of missing data, skewness, and kurtosis. The minimum and maximum values, means, and standard deviations of each of the variables are also inspected for plausibility. Variables that are transformed to correct for the normality assumption are identified, followed by a discussion on selection bias due to missing cases. This chapter also examines the distribution and frequency of each dependent and independent variable, the reasons for introducing the Heckman selection model, and the need to treat surveillance technology as a dummy variable.

Descriptive Statistics

Dependent Variables

The minimum and maximum value, standard deviation, mean value, skewness, and kurtosis of each dependent variable is shown in Table 4.1. The first dependent variable, the number of citizen complaints per 100 officers, had an average value of 6 per 100 officers and a range of 0 to 91. The second dependent variable, the percentage of dismissed complaints, had a mean of 62% and a range of 0% to 100%, indicating that most of the force complaints were dismissed. The third dependent variable, the percentage of sustained complaints, had a mean of 6 percent and a range of 0% to 100%.

One of the criteria used to test the normality assumption is an estimate of the kurtosis distribution, which should fall between +2 and -2. In addition, the skewness

should fall between -1 and +1. The variables citizen complaints per 100 officers and the percentage of sustained complaints violate the normality assumption, as a result of the large values for skewness and kurtosis (Table 4.1).

Table 4.1

Dependent Variables: Descriptive Statistics

	N	Mean	SD	Min	Max	Skewness	Kurtosis
Citizen Complaints							
Number of citizen complaints	496	44.83	252.80	0	4450		
Number of citizen complaints per 100 officers	496	6.01	8.59	0	90.70	4.39	28.27
Log transformed Ln(Y1) citizen complaint rate	462	1.37	.96	-2.57	4.51	.15	.60
Dismissed Complaints							
Number of dismissed complaints	496	19.46	100.85	0	1936		
Percentage dismissed Complaints	463	62.38	31.28	0	100	-.61	-.62
Sustained Complaints							
Number of sustained force complaints	496	3.28	16.69	0	177		
Percentage of sustained complaints	462	6.43	13.85	0	100	3.70	17.56
After log transformation Ln(Y3)	180	2.29	1.10	-.83	4.61	-.46	.29

Based on the analysis in Table 4.1, the average number of reported complaints per 100 officers is 6.01, with a standard deviation of 8.59. The data suggest that the frequency distribution of complaints per 100 officers is highly skewed (i.e., kurtosis = 28.27). In addition, an average of 62% of citizen complaints in local jurisdictions were exonerated or unfounded, suggesting that more than half of the complaints did not hold up to internal or external investigations. However, on average, the number of sustained complaints (i.e., where officers were found guilty) was only 6.4%, suggesting that

unfounded complaints are more likely to occur than legitimate ones. However, the frequency of the substantiated complaints is highly skewed ($M = 6.42$; $SD = 13.84$).

Given that the frequency distribution of two of the variables is highly skewed, and if the assumption of normality is not corrected for, the parameter estimates, using OLS, will be biased. The distributions of these variables may be normalized, by transforming them to natural logarithms before conducting the final analysis. Although a log-transformation may normalize a distribution, it may also lead to unstable variance, suggesting that a log-transformation approach may lead to heteroscedastic variance. Moreover, the log-transformation would also truncate the data (i.e., as reported in Table 4.1). For instance, in cases that have reported “0” incidence of sustained citizen complaints, after investigation, the log-transformation process results in missing data or reporting in error (283 cases). In other words, the consequence of log-transformation is transformational bias. In addition, 34 cases of sustained and dismissed use of force complaints were lost immediately after calculating their percentages.

A value that deviates from these limits indicates that the normality assumption is violated. In Table 4.1, a skewness of 4.39 and kurtosis of 28.27 were shown for the first dependent variable, the rate of citizen complaints per 100 officers. Log transformation corrects for the assumption of normality with the resulting skewness of .15 and kurtosis of .60. The percentages of dismissed complaints satisfied the normality assumption (skewness: -0.61 and kurtosis:-0.62, as reported in Table 4.1). However, the sustained complaints variable violated the normality assumption (i.e., skewness: 3.70 and kurtosis:

17.60, as reported in Table 4.1). But after the log transformation, the variable met the normality assumption (i.e., skewness = -0.46 and kurtosis = -0.29).

Detecting Potential Selection Bias: Mean *t*-test

Because of log transformation, some of the cases of sustained complaints were reported as missing. According to Tabachnick & Fidell (2007), a pattern of missing cases needs to be investigated, and its randomness must be evaluated, in order to detect a potential selection bias. This is important because any statistically significant differences between the missing cases (missing group) and non-missing cases (valid cases) may lead to incorrect conclusions concerning the final analysis.

For example, there were 48 missing cases after the log-transformation was performed on the number of citizen complaints per 100 officers category. The missing cases constituted more than 5% of the total sample size. Similarly, there were 48 missing cases from the percentage of dismissed complaints category. These missing cases also constituted more than 5% of the total sample. Finally, there were 330 missing cases after the log transformation of the percentage of sustained complaints category. The missing cases constituted about 65% of the sample size. The number of missing cases resulting from the log transformation of the sustained complaints is extremely large, in comparison to those in the other dependent variable categories.

I also compared the numbers of missing and non-missing cases for substantively important socio-demographic variables (i.e., the occupational, hierarchical, and functional differentiations, formalization, the violent crime rate, percentage of owner-

occupied households, the number of sworn officers per 10,000 citizens, and the minority representation ratio). These variables are measured at the interval-ratio level.

In order to detect a selection bias, various researchers have suggested performing inferential statistics, using the mean *t*-test (Babbie, Halley, & Zaino, 2003; Elliott & Woodward, 2007). Even though there are three types of *t*-tests included in SPSS, I used the independent-samples *t*-test (i.e., two sample *t*-test), since the socio-demographic variables are mostly measured as interval-ratio variables. In other words, the independent mean *t*-test is best suited to measuring the characteristics of variables that are measured at intervals (see Babbie, Halley, & Zaino, 2003). For example, valid cases may be grouped together in a dummy variable that equals “1”; while the group of missing cases acts as a comparison group and is recorded as “0.” A difference in means test is conducted to determine whether the means of the two groups, for each characteristic, are the same. The research hypothesis states that the differences in means of the two groups, for the same socio-demographic variables, are statistically different at the $p < .01$, $p < .05$, and $p < .10$ levels (Elliott & Woodward, 2007).

A mean *t*-test, comparing the missing and non-missing cases after log-transformation of the citizen complaints per 100 officers, is presented in Table 4.2. The null hypotheses were rejected for the variables of functional differentiation, the violent crime rate, percentage of owner-occupied households, and the number of sworn officers per 10,000 citizens, because the *p*-value for the equal variances *t*-test is greater than .10. In other words, the mean differences for the valid and missing cases in the analysis are

significantly different for functional differentiation, the violent crime rate, percentage owner-occupied households, and the number of sworn officers per 10,000 citizens.

A similar conclusion may be reached for the number of citizen complaints per 100 officers (see Table 4.3). Specifically, in Table 4.3, the results show that the null hypotheses are rejected for the variables of functional differentiation, violent crime rate, owner-occupied households, and sworn officers per 10,000 citizens, because the p -value for the equal variances t -test is greater than .10. In other words, between the two groups (i.e., valid and missing cases) in the variable of citizen complaints per 100 officers, there is statistical evidence to suggest that mean differences exist in terms of functional differentiation, the violent crime rate, percentage of owner-occupied households, and the number of sworn officers per 10,000 citizens.

In Table 4.4, the mean differences between the missing and non-missing cases for the number of sustained complaints, after performing log-transformation, are presented. Significant differences were found in many variables. For instance, in Table 4.4, the results indicate that the null hypotheses are rejected for all variables, except for the occupational differentiation, because the p -value for the equal variances t -test is greater than 0.10. The differences between means of the valid and missing cases are statistically significant. In the OLS model, if the missing cases are not taken into consideration, this may lead to biased estimates of the true population parameters. This is especially true if the significant difference between the mean test variable of missing and valid cases is not resolved.

Based on these analyses, Tables 4.2 and 4.3 show a potential selection bias. However, this bias is not as severe as that of the missing cases due to log transformation, presented in Table 4.4. There are several reasons for this conclusion. First, some of the test variables in Tables 4.2 and 4.3 demonstrated no significant mean differences for the groups of missing and valid cases. Second, the results in Table 4.4 demonstrate that the transformation bias is severe, since more than half of the cases were excluded from the analysis, and that almost all of the mean differences for the socio-economic variables were statistically significant among the two groups (i.e., non-missing cases and missing cases groups). As will be further discussed in the next chapter, the final analyses—based on the exclusion of the missing cases for the number of citizen complaints per 100 officers (logged) and the percentage of dismissed citizen complaints (as presented in Tables 4.2 and 4.3, respectively)—will yield no serious heteroscedasticity problems. However, for the final analysis of the number of sustained complaints (logged), when the missing cases were excluded from the analysis, there was a serious problem of heteroscedasticity.

In the Heckman selection model, the regression in the second stage adds the inverse Mills ratio (or lambda), which is estimated from the probit model as an additional regressor. The analysis using Heckman's model resolves the selection or transformation bias, by including the inverse Mills ratio as an additional regressor in the second equation. If lambda is significant, the transformation bias exists and the Heckman selection model is needed (Schneider, Scholz, Lubell, Mindruta, & Edwardsen, 2003). If lambda is not significant, there is no transformation bias, but Heckman selection model

may be needed. When Heckman selection model was run for the three dependent variables, it was found that lambda was significant only for the percentage of sustained complaints. For these reasons, I used OLS models for the number of citizen complaints per 100 officers and the percentage of dismissed complaints and the Heckman selection model for the percentage of sustained complaints.

Table 4.2

Comparing Mean Differences of Valid and Missing Cases: Citizen Complaints per 100 Officers (logged)

	Valid (n)	Missing (n)	Mean (Valid Cases)	Mean (Missing Cases)	Diff. of Means	<i>t</i> -test (2-tail)
Occupational differentiation	462	48	23.44	23.46	-.02	-.02
Hierarchical differentiation	462	48	1.47	1.46	.02	.17
Functional differentiation	458	34	8.44	6.74	1.71	2.13**
Formalization	460	48	12.48	12.50	-.02	-.09
Violent crime rate	462	34	75.10	35.57	39.53	4.19***
Owner-occupied households (%)	462	34	52.06	57.24	-5.18	-2.45**
Sworn officers per 10,000 citizens	462	48	22.03	19.64	2.40	1.79*
Minority representation ratio	462	34	.49	.43	.06	1.51

Notes. *t*-test of mean differences between groups assumes equal variance.

* $p < .10$; ** $p < .05$; *** $p < .01$

Table 4.3

*Comparing Mean Differences of Valid and Missing Cases: Percentage of Dismissed**Citizen Complaints*

	Valid (n)	Missing (n)	Mean (Valid Cases)	Mean (Missing Cases)	Diff. of Means	t-test (2-tail)
Occupational differentiation	462	48	23.44	23.46	-.02	-.02
Hierarchical differentiation	462	48	1.47	1.46	.02	.17
Functional differentiation	458	34	8.44	6.74	1.71	2.13**
Formalization	460	48	12.48	12.50	-.02	-.09
Violent crime rate	462	34	75.10	35.57	39.53	4.19***
Owner-occupied households (%)	462	34	52.06	57.24	-5.18	-2.45**
Sworn officers per 10,000 citizens	462	48	22.03	19.64	2.39	1.79*
Minority representation ratio	462	34	.49	.43	.06	1.51

Notes. t-test of mean differences between groups assumes equal variance.

p<.10; ** *p*<.05; *** *p*<.01

Table 4.4

*Comparing Mean Differences of Valid and Missing Cases: Percentage of Sustained**Citizen Complaints (logged)*

	Valid (n)	Missing (n)	Mean (Valid Cases)	Mean (Missing Cases)	Diff. of Means	t-test (2-tail)
Occupational differentiation	180	330	22.94	23.72	-.78	-.92
Hierarchical differentiation	180	330	1.58	1.41	.17	2.93***
Functional differentiation	180	312	9.57	7.61	1.96	4.73***
Formalization	180	328	12.82	12.30	.52	3.80***
Violent crime rate	180	316	89.00	62.93	26.07	5.31***
Owner-occupied households (%)	180	316	50.21	53.67	-3.46	-3.13***
Sworn officers per 10,000 citizens	180	330	23.10	21.11	1.99	2.44**
Minority representation ratio	180	316	.53	.46	.07	3.50***

Notes. t-test of mean differences between groups assumes equal variance.

* *p*<.10; ** *p*<.05; *** *p*<.01

Analysis of Heckman Selection Model

Although a natural logarithm transformation was used to normalize the distribution of the percentage of sustained complaints, this procedure has resulted in truncation. The results of the independent-samples *t*-test show evidence that the log-transformation has resulted in a transformational bias, because the mean interval ratio variables of valid and missing cases are significantly different. Statistical analyses based on non-randomly selected samples can lead to incorrect conclusions. For example, it is possible that the sample used for estimation is nonrandom, in the sense that censoring causes bias through the correlation of the error term with the independent variables (Vance, 2006). The Heckman selection model is recommended to correct for selection bias in censored or truncated data (Heckman, 1976, 1979).

Heckman (1979) created a two-stage estimator to moderate this bias. The first stage takes into account the selection equation, which is a probit model that estimates the whole dataset, in order to record the determinants of truncation or censoring. The second stage is called the outcome equation, which contains an estimation of a heteroskedasticity-corrected OLS regression on the non-censored cases. The regression in the second stage adds the inverse Mills ratio (or lambda), which is estimated from the probit model as an additional regressor. The analysis using Heckman's model resolves the selection or transformation bias, by including the inverse Mills ratio as an additional regressor in the second equation. Hence, by using the Heckman selection model, the error term correlation of selection factors and outcome factors are tested (Jang, 2006).

For the purpose of this research, the selection equation consists of whether a municipal police department has reported a sustained complaint case or not. In the outcome equation, the dependent variable is the percentage of sustained complaints after log-transformation. The empirical analysis will be conducted in two parts. The first part will examine the impact of the control variables on the presence of a sustained complaint case, where the parameter estimates are interpreted as log-likelihood or probability estimations. The second stage of the analysis will determine the impact of surveillance technology, conditional upon the equation model, on the number of sustained complaint cases after log-transformation. The final analysis will determine whether the use of a surveillance technology by a municipal police department will have an impact on the behavior of sworn officers (i.e., a reduction in the number of sustained complaints).

Independent Variables

According to Table 4.5, the average number of in-car cameras per 100 officers is 9.63, with a standard deviation of 16.06. This variable is an interval-ratio variable. The data suggest that the frequency distribution of in-car cameras per 100 officers is positively skewed (i.e., kurtosis = 6.66). However, 57.9% of municipal police departments did not use in-car cameras (Table 4.8). This means that 244 cases were in the zero category for this variable. In addition, the average number of CCTV per 100 officers is 1.63 with a standard deviation of 4.48. The data suggest that the frequency distribution of CCTV per 100 officers is highly skewed (i.e., kurtosis = 18.40), as indicated in Table 4.6. Furthermore, 71.1% of municipal police departments did not employ CCTV, in 2003 (Table 4.8). This means that 362 cases were in the zero category for the CCTV variable.

Given that the frequency distribution of two major surveillance technology variables is highly skewed, the distributions of these variables might be normalized by transforming them to natural logarithms before conducting the final analysis. However, because of the large number of responses in the zero category for the variables of in-car cameras and CCTV per 100 officers, zero inflation cannot be avoided. In other words, both of these surveillance technology variables could be log transformed and standardized, and this procedure might reduce the overall skewness and normalize the distribution, but zero inflation could not be avoided. It appears that a better solution would be to convert these variables to a dummy variable.

Table 4.5

Descriptive Statistics

	N	Mean	SD	Min.	Max.
Dependent Variables					
Citizen complaints per 100 Officers	496	6.01	8.59	0	90.70
Dismissed complaints (%)	462	62.38	31.28	0	100
Sustained complaints (%)	462	6.43	13.85	0	100
Surveillance Technology					
In-car camera per 100 Officers	509	9.63	16.06	0	106*
CCTV per 100 Officers	509	1.63	4.48	0	32.35
Organizational Structure					
Spatial differentiation	510	1.92	5.58	0	97
Occupational differentiation	510	23.44	9.15	0	52.06
Hierarchical differentiation	510	1.47	.62	.17	4.43
Functional differentiation	492	8.33	4.52	0	21
Formalization	508	12.48	1.49	6	14
Administrative Controls					
Internal affairs unit	495	.82	.38	0	1
Performance monitoring system	493	.33	.47	0	1
Separate investigation policy	495	.53	.50	0	1
Citizen administrative appeal	494	.37	.48	0	1
Collective bargaining	510	.73	.45	0	1
Environmental Factors					
Civilian complaint review board	495	.19	.40	0	1
Violent Crime Index	496	72.39	54	4.88	359.80
Percentage owner-occupied households	496	52.41	11.97	17.52	89.67
Sworn officers per 10,000 citizens	510	21.81	8.83	8.74	100.04
Minority representation ratio	496	.48	.23	0	1.58

Source: Law Enforcement Management and Administrative Statistics (LEMAS) (2003)

* The maximum number of in-car cameras per 100 officers was 106. An examination of the data reveals that the Jacksonville Police Department had 100 sworn officers and 106 in-car cameras.

Table 4.6

Descriptive Statistics (Skewness and Kurtosis)

	Skewness	Kurtosis
Dependent		
Citizen complaints per 100 Officers	4.39	28.27
Dismissed complaints (%)	-.61	-.62
Sustained complaints (%)	3.70	17.56
Surveillance Technology		
In-car cameras per 100 Officers	2.40	6.66
CCTV per 100 Officers	4.04	18.40
Organizational Structure		
Spatial differentiation	11.09	171.15
Occupational differentiation	-.04	-.21
Hierarchical differentiation	1.29	2.60
Functional differentiation	.48	0
Formalization	-1.31	2.30
Administrative Controls		
Internal affairs unit	-1.70	.86
Performance monitoring system	.71	-1.50
Separate investigation policy	-.10	-2.00
Citizen administrative appeal	.52	-1.74
Collective bargaining	-1.01	-.98
Environmental Factors		
Civilian complaint review board	1.55	.41
Violent crime rate	1.50	2.85
Owner-occupied households (%)	.08	.44
Sworn officers per 10,000 citizens	2.53	14.64
Minority representation ratio	.63	.90

Control Variables

Organizational Structure

The mean for spatial differentiation is 2 police stations, with a range of 0 to 97 and a standard deviation of 5.58 (Table 4.5). Spatial differentiation has an extremely skewed distribution (i.e., kurtosis = 171.15), which is an indicator that it violates the normality assumption. Because approximately 52.5% of the municipal police

departments in the LEMAS 2003 dataset had no police stations, this variable is a possible candidate for conversion to a dummy variable. Hence, a dummy variable was created for spatial differentiation to solve the normality problem. The mean of spatial differentiation, 1.92, was used as the threshold value, in creating the two categories. Municipal police departments that have two or more district, precinct, and division stations that are separate from their headquarters are coded as '1'; if otherwise, they are coded as '0'.

The mean of occupational differentiation was 23%, with a range of 0% to 52% and a standard deviation of 9.15 (Table 4.5). On average, 23% of police department personnel are non-sworn employees. The mean of hierarchical differentiation was 1.47, with a range of .17 to 4.43 and a standard deviation of 0.62. This indicates that a typical police chief's salary is 1.47% greater than an entry-level officer's salary. The mean of functional differentiation is 8.33 special units, with a range of 0 to 21 and a standard deviation of 4.52. This denotes that, on average, police departments have 8 special units. The mean of formalization is 12 officially written policies, with a range of 6 to 14 and a standard deviation 1.49. This suggests that, on average, police departments have 12 officially written policies.

Administrative Controls

A dummy variable, created for the internal affairs unit variable, indicated that 82% of the police departments have internal affairs units. A second dummy variable, constructed for the performance-monitoring system variable, indicated that 33% of the police departments have these systems. A third dummy variable, created for the investigation policy variable, showed that 53% of the police departments have this type

of policy. A fourth dummy variable, constructed for the citizen administrative appeal variable, indicated that 37% of the police departments have such a policy, which provides citizens the right of administrative appeal in cases involving use of force complaints. A fifth dummy variable, created for the collective bargaining variable, indicated that 73% of the police departments authorized the process of collective bargaining for sworn employees.

Environmental Factors

Another dummy variable, constructed for the civilian complaint review board variable, showed that 19% of the police departments have a civilian complaint review board in their jurisdictions. The mean violent crime rate was 72.4 violent crimes per 10,000 citizens, with a range of 4.9 to 359.8 and a standard deviation of 54. The mean percentage of owner-occupied households in the police department's jurisdiction was 52, with a range of 18% to 90% and a standard deviation of 11.97. The mean rate of police employment was 21.8 sworn officers per 10,000 residents, with a range of 8.7 to 100 and a standard deviation of 8.83. The mean minority representation ratio was 0.48, with a range of 0 to 1.58. Since a value of 1 indicates equivalent representation of minorities, this data shows that, on average, minorities are underrepresented among the sworn personnel in police departments. In contrast, a value of 1.58 indicates that minorities are overrepresented in a police department.

Comparing Usage of Surveillance Technology

Sworn officers from police departments that used both in-car cameras and CCTV may display more professional behavior, in comparison to sworn officers from police

departments that used only in-car cameras or CCTV, because of the presence of these surveillance technologies. Officers from police departments having both types of surveillance technologies may not violate departmental policies very often, because they may feel the pressure of an external control mechanism more than those officers from police departments that used only in-car cameras or CCTV. The extensive presence of surveillance technology may result in a situation of joint custody, where officers may always act appropriately.

The LEMAS 2003 dataset shows that there were 510 municipal police departments with one missing case on both in-car and CCTV cameras, in 2003. As mentioned in the previous chapter, although most municipal police departments have employed in-car cameras, only a few have used CCTV. The next analysis explores the extent to which both of these technologies are employed by municipal police departments. In a more detailed examination, the use of surveillance technology for in-car and CCTV cameras is classified into four categories, highlighting the different impacts of surveillance technology on the rate of citizen complaints and on their dispositions.

The surveillance camera variables are recoded to better record the extent to which surveillance cameras are used by law enforcement agencies. Hence, a categorical variable was created, based on the following categories: (1) if a law enforcement agency has both in-car and CCTV cameras, in 2003; (2) If the agency used only in-car cameras; (3) if the agency used only CCTV cameras, and (4) if the agency did not use either in-car or CCTV cameras, in 2003. The frequency distribution for the different categories of surveillance cameras is shown in Table 4.7. The data reveals that 17.3% (n = 88) of law enforcement

agencies employed both in-car and CCTV cameras in their agencies, while 34.8% (n = 177) of these agencies used only in-car cameras, and 11.6% (n = 59) used only CCTV cameras. In addition, 36.3% (n = 185) used neither, in-car nor CCTV cameras, in 2003.

The data revealed that most municipal police departments used only in-car cameras, in 2003. The percentages of police departments that used only in-car cameras (35%) and those that did not use either surveillance technology (36%) are almost equal. The category of surveillance technology usage that was the least was the one in which police departments used only CCTV (12%). It appears that most of the police departments used in-car cameras, while the fewest used only CCTV, in 2003. The data in Table 4.7 also shows that the primary type of surveillance technology used by police agencies is in-car cameras. One of the reasons for the extensive usage of in-car cameras may be the increased likelihood that in-car cameras will record the behavior of criminals and law enforcement officers, in comparison to CCTV cameras.

Table 4.7

Number of Police Departments with Surveillance Technologies, by Types (2003)

Categories of Surveillance Technology	Number of Police Departments with Surveillance Technologies
In-car camera only	177 (34.8)
CCTV camera only	59 (11.6)
Both in-car and CCTV cameras	88 (17.3)
Employed neither technology	185 (36.3)

Note. Percentages in parentheses

Experience of Municipal Police Departments with Usage of In-Car Cameras

The experience of municipal police departments in using in-car cameras may be positively associated with the dispositions of citizen complaints, but may be less associated with the actual number of citizen complaints. Proficiency in using this technology is important to consider in this research for the following reasons: first, the officers that are experienced with using in-car cameras may know better how to produce good or convincing evidence with these cameras than inexperienced officers. They can use in-car cameras to document or produce a videotape of an encounter. In contrast, when officers who lack the knowledge of how to operate an in-car camera record an encounter, the videotape footage may not show what really happened. Such a videotape may not provide sufficient evidence to dismiss or sustain an official citizen complaint and may not help a jury or internal investigators to prove the innocence or guilt of officers or suspects, alike.

However, videotapes made by officers who have experience with surveillance technology often show the incident clearly and may be shown to citizens before they make official complaints about the inappropriate use of force, by the officials in a police department. As a result, a citizen may decide not to make an official complaint because he/she believes that the officer acted appropriately. The second reason to consider officers' experience with using in-car cameras is that more experienced officers may be more careful to avoid videotaping their inappropriate behavior, in comparison to officers that are inexperienced with in-car cameras because experienced officers may perceive the

potential risk of getting punished when their inappropriate behavior are videotaped more than inexperienced officers.

On the other hand, patrol officers experienced with using in-car cameras may become accustomed to them and feel that these cameras have become a part of them. Eventually they may forget about the cameras and the fact that they are recording encounters with civilians. They may not realize that in-car cameras also record any of their own behavior which deviates from approved police policies. When overreacting to a suspect's uncooperative and disrespectful behavior, a police officer's inappropriate behavior may be recorded by in-car cameras. These videotapes may increase the percentage of sustained use of force complaints.

To determine the impact of experience in using surveillance cameras by municipal police departments on the number of use of force complaints and their dispositions, the data about in-car and CCTV cameras from the LEMAS 2000 dataset were retrieved and added to the LEMAS 2003 dataset. There were 35 missing cases in the in-car camera variable and 36 missing cases in the CCTV variable. The analysis comparing the frequency of use of these technologies, between 2000 and 2003, shows that, in 2000, in-car cameras were used by more municipal police departments than CCTV (Table 4.8). Specifically, almost 40% of the municipal police departments used in-car cameras, while only 25% of them employed CCTV cameras. Slightly less than two-thirds of the municipal police departments (i.e., 60.4%) did not use in-car cameras, in 2000 and three-fourths of them (i.e., 75.1%) did not use CCTV.

Table 4.8

Comparing Frequency of Surveillance Technology Usage between 2000 and 2003

	Number of Municipal Police Departments		
	2000	2003	
In-car camera			
Yes	188 (39.6)	265 (52.1)	Increased
No	287 (60.4)	244 (57.9)	Decreased
CCTV			
Yes	118 (24.9)	147 (28.9)	Increased
No	356 (75.1)	362 (71.1)	Decreased

To further evaluate the experience in usage of surveillance technology by municipal police departments, I recoded the surveillance camera variables from the LEMAS 2000 and 2003 datasets. Thus, two sets of categorical variables were created for in-car and CCTV cameras, based on the following categories: (1) if a police department did not use either in-car cameras or CCTV in 2000 and 2003; (2) if a police department used both in-car cameras and CCTV in 2000, but did not use them in 2003; (3) if a police department did not use in-car cameras and CCTV in 2000, but used both of them in 2003, and (4) if the agency used in-car and CCTV cameras both in 2000 and 2003.

It is interesting that, according to Tables 4.9 and 4.10, only 9% of municipal police departments ($n = 43$) abandoned the usage of in-car cameras, while 14% of them ($n = 64$) abandoned the usage of CCTV, in 2003. Slightly less than a third ($n = 144$) of the municipal police departments employed in-car cameras, while a few ($n = 54$) used CCTV, both in 2000 and 2003. In-car cameras were used more often than CCTV by municipal police departments, both in 2000 and 2003. However, more police departments used neither in-car cameras nor CCTV, in 2000 and 2003.

There were various reasons for the police departments choosing not to use both in-car cameras and CCTV, in 2000 and 2003. The first reason may be monetary, since surveillance technology is expensive. In addition, maintenance costs may discourage municipal police departments from using surveillance technology. The second reason may relate to technical problems with the cameras. The cameras may not work efficiently because of technical malfunctions. The third reason relates to the police subculture. Police officers may not like being videotaped, because these cameras may also record inappropriate behavior on their part. The fourth reason may relate to the concerns of police administrators. Police administrators may not be willing to have their officers' inappropriate behavior broadcast to others, because they may lose face in the eyes of the public. However, the data in Tables 4.9 and 4.10 shows that the usage of both in-car cameras and CCTV has increased since 2000, in comparison to the number of agencies that have abandoned surveillance technology.

Table 4.9

Municipal Police Departments with In-car Cameras in 2000 and 2003

Categories of In-car Cameras	Number of Municipal Police Department
In-car camera (2000)	43 (9.1)
In-car camera (2003)	99 (20.9)
In-car camera (2000 and 2003)	144 (30.4)
In-car camera not used (2000 and 2003)	188 (39.7)
Total	474 (100)

Table 4.10

Municipal Police Departments with CCTV in 2000 and 2003

Categories of CCTV	Number of Municipal Police Department
CCTV (2000)	64 (13.5)
CCTV (2003)	77 (16.3)
CCTV (2000 and 2003)	54 (11.4)
CCTV not used (2000 and 2003)	278 (58.8)
Total	473 (100)

Correlation Coefficients

The correlation coefficients for all of the variables are provided in Table 4.11. The usage of CCTV only, in 2003, and the amount of experience in using CCTV, in 2003 only, are positively correlated with the number of citizen complaints per 100 officers (Pearson's $r = .10$, $r = .12$, respectively). The correlation coefficients are somewhat weak, suggesting that the usage of CCTV only, in 2003, and the amount of experience in using CCTV, since 2000 (without other forms of surveillance technology), are associated with a higher number of citizen complaints. Municipal police departments with more experience in using in-car cameras tend to have higher percentages of sustained complaints (i.e., $r = .11$). This suggests that the municipal police departments that used in-car cameras, both in 2000 and 2003, had more sustained complaints than those that never used in-car cameras. The data in Table 4.11 also suggests that there is no serious multicollinearity problem, because the coefficients are well within expected values (i.e., less than .5). The next chapter presents the final analysis and results.

Table 4.11

Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Dependent Variable														
1. Complaints per 100 officers	1													
2. Dismissed complaints (%)	-.11**	1												
3. Sustained complaints (%)	.17**	-.31**	1											
Surveillance Technology														
4. In-car camera only	-.08	-.01	.06	1										
5. CCTV only	.10**	.004	-.01	-.26**	1									
6. In-car camera and CCTV	.05	.03	-.01	-.33**	-.17**	1								
7. Neither in-car camera nor CCTV	-.02	-.01	-.05	-.55**	-.27**	-.35**	1							
8. In-car camera (2000)	.01	-.02	.07	-.23**	.12**	-.14**	.26**	1						
9. In-car camera (2003)	-.03	-.03	-.04	.42**	-.18**	.13**	-.40**	-.16**	1					
10. In-car camera (2000 and 2003)	-.03	.03	.11*	.40**	-.23**	.36**	-.51**	-.21**	-.34**	1				
11. Never used in-car camera	.05	0	-.11*	-.59**	.30**	-.36**	.66**	-.26**	-.42**	-.54**	1			
12. CCTV (2000)	-.05	-.03	.04	.13**	-.14**	-.18**	.10*	.07	-.03	.02	-.03	1		
13. CCTV (2003)	.12**	.05	-.03	-.32**	.39**	.53**	-.34**	.02	.03	.07	-.10*	-.17**	1	
14. CCTV (2000 and 2003)	.05	0	.02	-.26**	.36**	.40**	-.28**	-.07	-.07	.11*	-.01	-.14**	-.16**	1
15. Never used CCTV	-.09*	-.02	-.01	.32**	-.42**	-.53**	.37**	-.02	.05	-.14**	.10*	-.47**	-.53**	-.43**

* $p < .05$; ** $p < .01$ *(table continues)*

Table 4.11 (continued).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Organizational															
16. Spatial differentiation	.21**	-.10*	.02	-.05	.05	.05	-.02	-.01	.04	-.04	.01	.03	.02	.12*	-.11*
17. Occupational differentiation (%)	-.03	.14**	-.07	.05	.003	-.08	.01	.06	.02	-.02	-.02	.03	-.02	-.06	.03
18. Hierarchical differentiation	.10*	-.12*	.04	-.06	.08	-.09*	.08	-.01	-.01	-.15**	.15**	.05	-.04	.03	-.03
19. Functional differentiation	.14**	-.06	-.04	-.19**	.09*	.08	.06	-.01	-.04	-.10*	.13**	-.05	.05	.16**	-.11*
20. Formalization	.06	-.05	.08	-.08	.08	.03	.001	.02	-.03	-.02	.03	.003	.03	.10*	-.08
Administrative															
21. Internal affairs unit	.13**	-.04	-.05	-.04	.01	.06	-.01	-.01	.05	-.03	-.01	.03	.02	.06	-.07
22. Performance monitoring system	.07	.02	.08	-.01	.01	.10*	-.08	-.03	-.02	.07	-.04	-.01	.05	.05	-.06
23. Separate investigation policy	-.002	-.05	.04	.01	.03	.004	-.03	-.09*	.04	-.03	.05	-.05	.01	.03	.01
24. Citizen administrative appeal	.01	-.05	-.04	-.01	.08	.02	-.06	-.04	-.001	-.001	.03	-.02	.04	.06	-.06
25. Collective bargaining	-.06	-.03	-.08	-.16**	.09	-.13**	.20**	.02	-.05	-.22**	.23**	-.08	-.01	-.06	.10*
Environmental															
26. Citizen complaint review board	.13**	-.06	.01	-.06	.03	-.01	.05	-.03	.06	-.11*	.07	.06	-.02	.05	-.05
27. Violent crime rate	.15**	-.21**	.02	.02	-.04	.01	-.003	-.05	.05	0	-.01	-.002	-.02	.01	.01
28. Owner-occupied households (%)	-.12*	.14**	.08	-.02	.01	.13**	-.08	.02	-.05	.13**	-.09*	.03	.12**	.02	-.12**
29. Sworn officers per 10,000 citizens	.10*	-.22**	-.04	.05	-.08	-.05	.04	-.06	.10*	-.07	.01	.04	-.10*	-.02	.05
30. Minority representation ratio	.15**	-.10	.07	-.02	-.03	.05	.01	-.02	.03	-.01	-.004	-.01	.07	-.04	-.02

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

(table continues)

Table 4.11 (continued).

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Organizational															
16. Spatial differentiation	1														
17. Occupational differentiation (%)	-.03	1													
18. Hierarchical differentiation	.12**	-.14**	1												
19. Functional differentiation	.40**	.09	.14**	1											
20. Formalization	.11*	.07	.06	.17**	1										
Administrative															
21. Internal affairs unit	.18**	.11*	.13**	.35**	.05	1									
22. Performance monitoring system	.16**	.12*	.03	.24**	.19**	.13**	1								
23. Separate investigation policy	.15**	-.14**	.10*	.10*	.15**	.06	.09*	1							
24. Citizen administrative appeal	-.06	-.15**	.04	.06	.04	-.03	-.02	.08	1						
25. Collective bargaining	-.13**	.004	.04	-.03	.01	-.04	-.01	-.02	-.05	1					
Environmental															
26. Citizen complaint review board	.27**	.01	.01	.29**	.14**	.14**	.15**	.12**	.06	.07	1				
27. Violent crime rate	.32**	-.13**	.16**	.23**	.05	.19**	.07	.14**	-.02	-.01	.25**	1			
28. Owner-occupied households (%)	-.22**	.09*	-.24**	-.16**	-.01	-.20**	.03	-.09*	.06	-.003	-.19**	-.44**	1		
29. Sworn officers per 10,000 citizens	.22**	-.26**	.24**	.09*	.01	.12**	-.04	.19**	-.03	-.02	.16**	.55**	-.50**	1	
30. Minority representation ratio	.23**	.09	.13**	.15**	.17**	.13**	.13**	-.02	-.06	-.01	.17**	.24**	-.20**	.16**	1

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

CHAPTER 5

EMPIRICAL FINDINGS AND DISCUSSION

This chapter reports the general findings of the final analyses, i.e., the impact of in-car cameras and CCTV on the number of citizen complaints about the inappropriate use of force and their dispositions. The results are summarized in Tables 5.1, 5.2, and 5.3, using a total of nine models. Note that the analyses and results in Table 5.3 are based on Heckman's two-step analysis. While the coefficient estimates of the outcome equations in Table 5.3 can be interpreted in a manner similar to an OLS model, the results of the selection equations are interpreted by probit analysis, i.e., the log likelihood of a municipal police department having a sustained complaint case as opposed to not having a sustained complaint case.

The main research questions, formulated in my previous chapters, seek to explore the impact of in-car and CCTV cameras on the number of citizen complaints (per 100 officers) of inappropriate use of force, and on the percentage of dismissed and sustained complaints. The specific objective of this chapter was to test the prediction that when municipal police departments used both in-car and CCTV cameras in 2003, they were likely to receive fewer numbers of complaints, have more complaints dismissed, and have fewer sustained complaints. In terms of the experience in using surveillance technology, this chapter investigates whether municipal police departments that used CCTV or in-car cameras, both in 2000 and 2003, received fewer numbers of complaints, dismissed more

official complaints, and sustained fewer complaints, in comparison to municipal police departments that never used CCTV or in-car cameras, both in 2000 and 2003.

The following sections test these general propositions. The findings are summarized as follows: The first major finding was that the use of surveillance technology by the police is necessary, but insufficient, in reducing the number of complaints. This is because the evidence shows that a large number of sustained complaints are reported, even when the municipal police departments used in-car cameras and CCTV. The analysis also revealed that when municipal police departments used only in-car cameras in 2003, and both in-car cameras and CCTV in 2003, they generally had a higher percentage of sustained complaints, in comparison to municipal police departments without in-car cameras or CCTV.

The second major finding is that the experience of police departments in using this technology matters. The analysis suggests that, on average, when municipal police departments used CCTV only in 2000, they had a higher number of sustained complaints than municipal police departments without CCTV. The analysis also suggests that municipal police departments that had some experience with in-car cameras, both in 2000 and 2003, also tended to have a higher percentage of sustained complaints, in comparison to municipal police departments without in-car cameras. In terms of the number of force complaints, the analysis suggests that municipal police departments that used CCTV only in 2003 received a higher number of citizen complaints, in comparison to municipal police departments without CCTV, both in 2000 and 2003. In terms of dismissed

complaints, no evidence was found to demonstrate that surveillance technology has an impact on the percentage of dismissed complaints.

The Impact of Surveillance Technology on Force Complaints

Comparing Usage Categories of Surveillance Technology

Principal-agent theory predicts that increased supervisory monitoring can reduce inappropriate behavior by police officers. Increased supervisory monitoring includes the use of both in-car and CCTV cameras by a police department. Using both in-car cameras and CCTV increases the effects of monitoring on the officers' behavior. The reason for this is that the two types of surveillance technology increase the potential risk of getting punished, when inappropriate behavior is videotaped. Specifically, officers employed by police departments that have both types of surveillance technology may not violate departmental policies very often because they may feel that they are under more pressure than those officers from police departments that used only in-car cameras, only CCTV or neither of them. The extensive presence of surveillance technology may result in a situation of joint custody, where officers may always act appropriately. Hence, it is predicted that municipal police departments that use in-car cameras or CCTV or, in particular, both of them will receive fewer force complaints, in comparison to police departments without surveillance technology in 2003.

The routine activity theory predicts that citizens will act more appropriately during an encounter and will not file intentional false complaints, when they are in the jurisdictions of police departments that use both in-car cameras and CCTV, in comparison to citizens or suspects in the jurisdictions of police departments that use only

in-car cameras, only CCTV, or neither of them. This is because the potential risk of being videotaped is higher in the presence of surveillance technology.

However, the principal-agent and routine activity theories did not accurately predict the number of force complaints. In Model 1 (see Table 5.1), there is no evidence to suggest that the different usage categories of surveillance technology have an impact on the number of force complaints (per 100 officers).

Experience of Municipal Police Departments with Use of Surveillance Technology

The principal-agent theory predicts that the level of experience that municipal police departments have using surveillance technology has a negative impact on the number of citizen complaints, because the level of perceived potential risk should be higher if the level of experience with surveillance technology is increased. The perceived potential risk is the officers' perception that they will be more likely to be convicted, when their inappropriate behavior is videotaped. Hence, it can be predicted that as experience with surveillance technology increases, the number of force complaints will decrease.

In addition, the routine activity theory predicts that the perceived potential risk for citizens' or suspects' will be higher in the jurisdictions of police departments having experience with in-car cameras or CCTV (using CCTV or in-car cameras, both in 2000 and 2003) than in the jurisdictions of police departments that had no experience, or only limited experience (used only in 2000 or only 2003), with surveillance technology. One of the reasons for this may be that citizens, or suspects, or some of their friends and relatives, might have been convicted previously, based on the videotaped evidence captured by surveillance technology.

However, both theories failed to predict that, as experience with surveillance technology increased, the number of force complaints decreased. The results in Model 2 (see Table 5.1) demonstrate that all of the categories of experience in using in-car cameras had no impact on the number of force complaints, even though a negative effect was predicted by the coefficients from both theories.

However, in contrast to both theories, the final analysis in Model 3 (see Table 5.1) shows that the presence of surveillance technology (CCTV in 2003) increased the number of force complaints. Specifically, municipal police departments that used CCTV in 2003 received more force complaints than police departments that did not use CCTV. Actually, these police departments had less experience with CCTV in 2003, because the LEMAS 2000 dataset shows that these police departments did not use CCTV in 2000. Hence, these police departments adopted the CCTV surveillance program sometime in 2001, 2002, or 2003.

The results in Model 3 (see Table 5.1) revealed that, if municipal police departments were experienced in the usage of CCTV after 2000, there was a high probability that they would have a relatively high number of citizen complaints, in comparison to the municipal police departments that were not experienced in the usage of CCTV, either in 2000 or 2003. The difference is statistically significant at the 0.01 level, or by about 72% [i.e., $(4.90-1.36)/4.90 = 0.722$]. For example, the association between police departments having experience with CCTV in 2003 and the number of citizen complaints (per 100 officers), is positive and statistically significant at the 0.01 level. Specifically, when the other variables are held constant, the municipal police departments

that have introduced CCTV after 2000 have a median number of complaints of 4.90 (i.e., $\exp(1.28 + .31)$), while the median percentage of citizen complaints for municipal police departments that did not use CCTV, during both time periods, is 1.36 (i.e., $\exp(.31)$).

There are several alternative explanations for this finding. In the years just after 2000, when CCTV was first introduced, both officers and citizens did not perceive the potential risk of getting punished when their inappropriate behavior was videotaped, because the officers and citizens had little or no experience with surveillance technology. Hence, the presence of surveillance technology did not deter them from behaving inappropriately. Although incidents were being videotaped, citizens or suspects still acted uncooperatively and the level of inappropriate use of force by officers was similar to that used before the introduction of CCTV. In addition, an officer may perceive that the presence of CCTV is not a potential risk, because they believe that their supervisors will protect them, even though their inappropriate use of force is being videotaped.

An alternative explanation for this finding may be that citizens or suspects will file intentional false complaints or unintentional complaints, even though the incident or encounter was videotaped. It is interesting to note that career criminals may also file intentional force complaints for several reasons, such as receiving compensation from police departments. These criminals, in the presence of a CCTV, might provoke officers to use force and then, later, file a force complaint. In contrast, some citizens or suspects who believe that brutal officers do not get punished, may not make official complaints, even when surveillance technology is present. However, with the introduction of CCTV

in 2003, those who were aware that incidents were being videotaped by a CCTV, tended to file official complaints.

Table 5.1

Predicting the Rate of Citizen Complaints (per 100 officers)

	Model 1	Model 2	Model 3
Presence of Surveillance Technology			
In-car camera only	-.11 (.11)	-	-
CCTV only	.22 (.15)	-	-
In-car and CCTV	.12 (.13)	-	-
Experience (In-car Cameras)			
In-car camera (2000)	-	.19 (.17)	-
In-car camera (2003)	-	-.058 (.12)	-
In-car camera (2000 and 2003)	-	-.018 (.11)	-
Experience (CCTV)			
CCTV (2000)	-	-	-.09 (.14)
CCTV (2003)	-	-	.31*** (.13)
CCTV (2000 and 2003)	-	-	.05 (.15)
Organizational			
Spatial differentiation	.23** (.11)	.22** (.11)	.21** (.11)
Occupational differentiation	-.004 (.005)	-.01* (.01)	-.01 (.01)
Hierarchical differentiation	.07 (.07)	.10 (.08)	.11 (.07)
Functional differentiation	-.01 (.01)	-.01 (.01)	-.01 (.01)
Formalization	.01 (.03)	.02 (.03)	.02 (.03)
Administrative			
Internal affairs unit	.16 (.13)	.23 (.14)	.22 (.14)
Performance monitoring system	-.10 (.10)	-.05 (.10)	-.06 (.10)
Separate investigation policy	-.01 (.09)	-.09 (.09)	-.10 (.09)
Citizen administrative appeal	-.02 (.09)	-.05 (.09)	-.06 (.09)
Collective bargaining	-.05 (.10)	-.05 (.11)	-.05 (.10)
Environmental			
Citizen complaint review board	.29** (.12)	.30*** (.12)	.31*** (.12)
Violent crime rate	.002** (.001)	.002* (.001)	.002* (.001)
Owner-occupied households	-.01** (.01)	-.01* (.01)	-.01 (.01)
Sworn officers per 10,000 citizens	-.003 (.01)	-.003 (.01)	-.001 (.01)
Minority representation ratio	-.33 (.21)	.35* (.21)	.30 (.21)
Constant	1.44*** (.53)	1.32** (.55)	1.28** (.55)
Number of Observations (<i>N</i>)	455	429	428
R-Square	.128	.132	.144
Adjusted R-Square	.092	.093	.106
F-value	3.56	3.46	3.81
Sig. (Prob>F)	.000	.000	.000
Mean VIF	1.30	1.30	1.27
Cook-Weisberg test	2.36	.46	.66

Note. Values in parentheses are standard errors; Cook-Weisberg tests are not statistically significant at the 0.01 level, suggesting no serious heteroscedasticity problems; the mean values of Variance Inflated Factors (VIF) are less than 10, suggesting no serious multicollinearity problem; * $p < .10$; ** $p < .05$; *** $p < .01$

The Impact of Surveillance Technology on Dismissed Complaints

Principal-agent theory predicts that, even though officers may act appropriately in the presence of surveillance technology, citizens or suspects will file intentional false or unintentional complaints. Hence, it can be expected that the videotaped evidence will increase the percentage of dismissed complaints, when the citizen complaint policies of police departments require that even unintentional or intentional false complaints are received. In such situations, even though supervisors know that the complaint is unintentional or intentionally false, they are required to assign a case number to it. In these cases, the percentage of dismissed complaints should be increased.

The principal-agent theory failed to predict the impact of surveillance technology on dismissed complaints. There is no evidence to suggest that surveillance technology has an impact on the percentage of dismissed complaints. Table 5.2 suggests that the experience with in-car cameras and CCTV has no impact on the number of dismissed complaints. In Model 4, 5, and 6 (see Table 5.2), there is no evidence to suggest that municipal police departments that used surveillance technology dismissed more force complaint cases, than municipal police departments that did not use surveillance technology.

One possible explanation for this finding may be that most of the citizen complaints that were dismissed did not occur in the presence of surveillance technology. Another possible explanation may be that citizens or suspects did not file official unintentional or intentionally false complaints. Or citizens or suspects may have withdrawn their unintentional or intentionally false complaints before filing an official complaint, when they were shown the footage of the incidents, in the police departments.

Table 5.2

Predicting the Rate of Dismissed Complaints (%)

	Model 4	Model 5	Model 6
Presence of Surveillance Technology			
In-car camera only	-.62 (3.57)	-	-
CCTV only	-.19 (4.96)	-	-
In-car and CCTV	2.86 (4.39)	-	-
Experience (In-car cameras)			
In-car camera (2000)	-	-4.27 (5.62)	-
In-car camera (2003)	-	-1.14 (4.14)	-
In-car camera (2000 and 2003)	-	-.02 (3.80)	-
Experience (CCTV)			
CCTV (2000)	-	-	-2.27 (4.55)
CCTV (2003)	-	-	3.81 (4.27)
CCTV (2000 and 2003)	-	-	2.61 (4.93)
Organizational			
Spatial differentiation	-1.56 (3.65)	-2.51 (3.71)	-2.82 (3.73)
Occupational differentiation	.36** (.17)	.26 (.18)	.27 (.18)
Hierarchical differentiation	-2.22 (2.47)	-2.08 (2.54)	-2.03 (2.52)
Functional differentiation	-.14 (.39)	-.29 (.40)	-.32 (.40)
Formalization	-1.07 (1.00)	-1.29 (1.03)	-1.34 (1.04)
Administrative			
Internal affairs unit	-.56 (4.44)	1.09 (4.75)	.81 (4.74)
Performance monitoring system	1.90 (3.24)	3.27 (3.36)	3.30 (3.35)
Separate investigation policy	1.14 (3.06)	1.21 (3.16)	1.23 (3.17)
Citizen administrative appeal	-2.63 (3.10)	-4.69 (3.18)	-4.84 (3.19)
Collective bargaining	-2.26 (3.41)	-2.00 (3.60)	-2.02 (3.48)
Environmental			
Citizen complaint review board	1.21 (3.95)	1.10 (4.00)	1.32 (4.01)
Violent crime rate	-.06* (.03)	-.06* (.03)	-.06** (.03)
Owner-occupied households	-.005 (.15)	-.01 (.16)	-.02 (.16)
Sworn officers per 10,000 citizens	-.40* (.21)	-.44** (.21)	-.40* (.22)
Minority representation ratio	6.58 (6.85)	-5.62 (7.07)	-5.84 (7.11)
Constant	90.46*** (17.54)	97.20*** (18.57)	96.83*** (18.43)
Number of Observations (<i>N</i>)	455	429	428
R-Square	.084	.088	.090
Adjusted R-Square	.046	.048	.050
F-value	2.22	2.21	2.25
Sig. (Prob>F)	.003	.003	.003
Mean VIF	1.30	1.30	1.27
Cook-Weisberg test	.05	.09	.02

Note. Values in parentheses are standard errors; Cook-Weisberg tests are not statistically significant at the 0.01 level, suggesting no serious heteroscedasticity problems; the mean values of Variance Inflated Factors (VIF) are less than 10, suggesting no serious multicollinearity problem; * $p < .10$; ** $p < .05$; *** $p < .01$.

The Impact of Surveillance Technology on Sustained Complaints

The principal-agent theory predicts that officers will act or behave more appropriately in the presence of surveillance technology. Specifically, officers would not be expected to use inappropriate force in any circumstances, in the presence of in-car cameras and CCTV. Hence, the principal-agent theory predicts that municipal police departments that used surveillance technology should sustain fewer force complaints, in comparison to municipal police departments that did not use surveillance technology.

Comparing Usage Categories of Surveillance Technology

The principal-agent theory predicts that the significant usage of surveillance technology should increase officers' perceptions of the potential risk of getting punished, when their inappropriate behavior is videotaped. Hence, it is predicted that municipal police departments that use in-car cameras, or CCTV or both of them, should have a lower percentage of sustained complaints, in comparison to police departments that did not use surveillance technology, in 2003. However, the findings regarding the usage of surveillance technology were counterintuitive to the principal-agent theory.

The findings of Model 7 (see Table 5.3) suggest that the video footage, captured by in-car cameras, is more likely to result in sworn police officers being found guilty, and that citizen complaints about officers' behavior are likely to lead to official convictions. The results in Model 7 suggest several interesting conclusions. At the top of Model 7, the analysis shows that, in 2003, the presence of in-car cameras in municipal police departments had a positive impact on the percentage of sustained citizen complaints. That is, when compared to municipal police departments that did not have in-car cameras *or*

CCTV, the number of sustained complaints was found to be higher among municipal police departments that only employed in-car cameras (i.e., $\beta = 0.30$). The association is statistically significant at the 0.10 level. When the other variables are held constant, we can expect municipal police departments that had in-car cameras (in 2003) to have a median percentage of 4.35 sustained complaints (i.e., $\exp(1.17 + .30) = 4.35$), while the median percentage of sustained complaints for municipal police departments without in-car cameras and CCTV, in 2003, is 1.35 (i.e., $\exp(.30) = 1.35$).

Table 5.3 also shows that the difference in the percentage of sustained complaints is rather large. The municipal police departments using in-car cameras in 2003, tended to have a much higher median percentage of sustained complaints, in comparison to municipal police departments that did not use in-car cameras or CCTV, in 2003; the median percentage was about 69% higher (i.e., $(4.35-1.35)/4.35 = 0.689$).

The results of Model 7 also suggest that the usage of both types of surveillance technology in 2003 (i.e., in-car cameras *and* CCTV), had a positive impact on the percentage of sustained complaints. The impact is statistically significant at the 0.05 level. Municipal police departments that used both in-car cameras and CCTV, in 2003, had a higher percentage of sustained complaints, in comparison to municipal police departments that used either in-car cameras or CCTV, or neither type of surveillance technology, in 2003. This finding suggests that the video footage recorded by in-car cameras *and* CCTV are likely to contribute to an increase in the number of convictions of police officers. Specifically, municipal police departments that used both in-car cameras *and* CCTV, in 2003, had a median percentage of sustained complaints of 5.64 (i.e., \exp

$(1.17 + 0.56) = 5.64$), while the median percentage of complaints for municipal police departments that did not use in-car cameras and CCTV, in 2003, was 1.75 (i.e., $\exp(0.56) = 1.75$). The municipal police departments employing both types of surveillance technology, in 2003 (i.e., in-car cameras and CCTV), had a higher median number of sustained force complaints than those that did not use in-car cameras and CCTV in 2003; the median percentage was about 69% higher (i.e., $(5.64-1.75)/5.64 = 0.689$).

Experience of Municipal Police Departments with Use of Surveillance Technology

When the level of experience in using surveillance technology is increased, the level of perceived potential risk should be higher in police officers. The perceived potential risk is the officers' perception that they will be more likely to be convicted, when their inappropriate behavior is videotaped. Officers' perceived potential risk would be expected to be higher in the police departments that had experience with using in-car cameras or CCTV (using CCTV or in-car cameras, both in 2000 and 2003), than for those officers in police departments that had no experience or a little experience (used only in 2000, or 2003) with surveillance technology. This is because officers with experience in using surveillance technology should know better, than inexperienced officers, that they will be more likely to be convicted, when their inappropriate behavior is videotaped. However, the results of the two experience models are, again, counterintuitive to the principal-agent theory.

The results from Model 8 (see Table 5.3) are based on the Heckman's two-step analysis, taking into account potential selection bias due to truncated samples. The analysis reveals two important findings: first, municipal police departments' experience

with in-car cameras, since 2000, has a positive association with the percentage of sustained complaints, in comparison to municipal police departments without experience with in-car cameras (i.e., $\beta = 0.75$). Second, municipal police departments' experience with in-car cameras in 2000, but not in 2003, had a positive impact on the percentage of sustained complaints, in comparison to municipal police departments without experience with in-car cameras (i.e., $\beta = 0.54$). Both of these associations are statistically significant at the 0.01 and 0.05 levels, respectively.

The municipal police departments that used in-car cameras, both in 2000 and 2003, have higher percentages of sustained complaints, in comparison to municipal police departments without in-car cameras, either in 2000 or 2003. Specifically, the municipal police departments using in-car cameras during both periods of study (i.e., in 2000 and 2003), had a median percentage of sustained complaints of 6.42 (i.e., $\exp(1.11 + .75)$), while the median percentage of sustained complaints for municipal police departments that did not use in-car cameras, both in 2000 and 2003, was 3.03 (i.e., $\exp(1.11)$). When all the other variables were held constant, the municipal police departments that used in-car cameras in 2000 and 2003, had a median percentage of sustained force complaints that was about 53% (i.e., $(6.42-3.03)/6.42 = 0.528$) higher than that of municipal police departments that did not use in-car cameras, during both time periods.

The results in Model 9 (see Table 5.3) demonstrate an interesting finding. Municipal police departments, experienced in the usage of CCTV in 2000 (but not in 2003), generally had a higher percentage of sustained complaints, in comparison to those

without CCTV, during both time periods. The median difference is statistically significant at the 0.10 level. Specifically, this result suggests that municipal police departments which used CCTV, only in 2000, have a higher percentage of sustained complaints, in comparison to municipal police departments that have not experienced the usage of CCTV. For example, when the effect of all the other variables is held constant, municipal police departments that have experienced the usage of CCTV, in 2000, have a median percentage of sustained complaints of 4.81 (i.e., $\exp(1.13 - .44)$), while the median percentage of sustained complaints for municipal police departments without experience with CCTV is 1.55 (i.e., $\exp(.44)$). Based on Model 9, this finding suggests that the median percentage of sustained complaints differs by about 68% (i.e., $(4.81 - 1.55)/4.81 = 0.678$).

These findings may be explained in the following way. Officers might not perceive a surveillance camera, which can detect and identify their inappropriate behavior during an encounter, to be a potential risk, because they may believe that their supervisors will protect them and they will not be punished. Furthermore, officers, in many instances, could not stop themselves from overreacting to a suspect's inappropriate, uncooperative, and disrespectful behavior, even though surveillance technology was present, because they lost control of themselves in a crisis situation. Moreover, officers might become accustomed to the presence of surveillance technology. Officers experienced with the usage of surveillance technology, in many cases, might forget that surveillance cameras exist and are videotaping their inappropriate behavior and, therefore, be convicted. In addition, some officers might use inappropriate force in the

presence of surveillance technology, because they believed that their police department did not review the videotapes regularly, and they expected no trouble unless a complaint was filed.

In addition, the general experiences of municipal police departments with surveillance technology may provide another, crucial alternative explanation of the findings. It appears that police departments started using in-car cameras extensively between the years 2000 and 2003, because the federal government gave them grants to purchase in-car cameras, in 2000 and 2003. Even though police departments that used in-car cameras, both in 2000 and 2003, are coded in this study as being the most experienced police departments with using in-car cameras, actually, these police departments may also be inexperienced with in-car cameras.

The findings of this research did not surprise some municipal police officers, while discussing the usage of in-car cameras, between the years 2000 and 2003. One municipal police officer in Texas indicated that police officers did not change their organizational behavior after the introduction of in-car cameras, which were newly installed in patrol cars, between the years 2000 and 2003, because changing one's behavior takes time (S. Kirk, personal communication, September 15, 2009). It appears that, when in-car cameras were new to police officers, they continued to behave in the same manner that they had before the presence of surveillance cameras. Hence, their inappropriate behaviors were detected and they were convicted, or their behavior resulted in an increased number of force complaints. For instance, even though police officers are expected to act appropriately under all circumstances, a Texas resident stated that "if you

run from the police, the rule is that you will be beaten” (A. Balic, personal communication, August 20, 2009). If the beating of a suspect after a high speed chase was the rule, before the introduction of in-car cameras, it could be expected that this rule would be changed, after the introduction of in-car cameras. However, the findings of this study indicate that officers probably continued to behave the same way as they did before the introduction of in-car or CCTV cameras. In a way, this is not surprising, because the expected benefits of surveillance technology did not occur immediately after its introduction.

Table 5.3

*Predicting the Percentage of Sustained Complaints (Logged): Heckman's Selection**Model*

Outcome Equation	Model 7	Model 8	Model 9
Presence of Surveillance Technology			
In-car camera only	.30* (.18)	-	-
CCTV only	.04 (.23)	-	-
In-car and CCTV	.56** (.23)	-	-
Experience (In-car cameras)			
In-car camera (2000)	-	.54** (.25)	-
In-car camera (2003)	-	.15 (.20)	-
In-car camera (2000 and 2003)	-	.75*** (.19)	-
Experience (CCTV)			
CCTV (2000)	-	-	.44* (.25)
CCTV (2003)	-	-	.34 (.23)
CCTV (2000 and 2003)	-	-	.17 (.24)
Lambda (Mills Ratio)	1.08*** (.24)	.98*** (.22)	1.13*** (.24)
Constant	1.17*** (.25)	1.11*** (.23)	1.13*** (.25)
Selection Equation			
Organizational			
Spatial differentiation	.53*** (.15)	.57*** (.15)	.56*** (.15)
Occupational differentiation	-.01 (.01)	-.01 (.01)	-.01 (.01)
Hierarchical differentiation	.20* (.11)	.21* (.11)	.21** (.11)
Functional differentiation	.01 (.02)	.01 (.02)	.01 (.02)
Formalization	.12*** (.05)	.14*** (.05)	.14*** (.05)
Administrative			
Internal affairs unit	.28 (.19)	.40** (.20)	.39** (.20)
Performance monitoring system	.08 (.14)	.03 (.14)	.02 (.14)
Separate investigation policy	.20 (.13)	.16 (.13)	.15 (.13)
Citizen administrative appeal	-.33*** (.13)	-.33** (.14)	-.32** (.14)
Collective bargaining	-.26* (.14)	-.21 (.14)	-.22 (.14)
Environmental			
Citizen complaint review board	.29* (.17)	.30* (.17)	.31* (.17)
Violent crime rate	.004*** (.001)	.003** (.001)	.004** (.001)
Owner-occupied households	-.003 (.01)	-.003 (.01)	-.004 (.01)
Sworn officers per 10,000 citizens	-.02** (.01)	-.02* (.01)	-.02* (.01)
Minority representation ratio	.25 (.29)	.17 (.30)	.18 (.30)
Constant	-2.07*** (.80)	-2.44*** (.83)	-2.43*** (.83)
Number of Observations (<i>N</i>)	489	479	478
<i>N</i> (censored)	309	309	309
<i>N</i> (uncensored)	180	170	169
Wald Chi2 (3)	6.91	18.14	4.53
Prob > Chi2	0.075	.000	0.210

Note. Values in parentheses are standard errors; * $p < .10$; ** $p < .05$; *** $p < .01$

Control Variables

Organizational Factors

Based on the relevant literature and according to Hickman and Piquero (2009), three main factors --organizational structure, administrative factors, and environmental factors-- may be tested to determine whether they have an impact on the behavior of municipal police departments. This is important because the relationship between surveillance technology and force complaints and their dispositions may be statistically significant. Introducing these control variables may remove any spurious relationships and improve the accuracy of the results.

Spatial differentiation: When municipal police departments increase in size, it is also expected that the number of force complaints and their dispositions will increase. Greater spatial differentiation of police departments is also associated with greater size., A police station that is in close proximity to a community may receive increased numbers of complaints, because citizens' access to the complaint process is increased, due to the reduction in travel time to a police facility to make an official complaint. Greater specialization is associated with a large number of complaints and a large percentage of dispositions.

Generally, the results suggest that a greater spatial differentiation is associated with a greater number of force complaints. In the middle of Model 1 (see Table 5.1), the analysis shows that municipal police departments with two or more police stations received more citizen complaints per 100 officers, in 2003, than those departments with one, or without any, police stations by a factor of 1.25 (i.e., $\exp (.23)$). The analysis

suggests that increasing the accessibility, or closeness, of a police station to its citizens, results in an increase in the number of citizen complaints. Specifically, if the other variables are held constant, the median number of complaints per 100 officers for municipal police departments with two or more police stations is 5.31 (i.e., $\exp(1.67)$), while the median number of complaints per 100 officers for those departments with one, or without any, police stations is 4.22 (i.e., $\exp(1.44)$). Police departments with more than two sub-stations had a median number of citizen complaints that was about 21% higher, than for police departments with only one, or without any, police sub-stations.

The results from Models 7, 8, and 9 (see Table 5.3) show that there are positive associations between the spatial differentiation of a police department and the likelihood of having a sustained complaint case. These impacts are statistically significant at the 0.01 level. Substantively, if the effects of all other variables are held constant, the log likelihood of municipal police departments with two or more police stations having a sustained complaint case, is only .15 (i.e., $\exp(.57 - 2.44)$), while the log likelihood of those departments with only one, or without any, police stations having a sustained complaint case is higher, at 1.76 (i.e., $\exp(.57)$). In other words, if the other variables are held constant, a municipal police department with one, or without any, police sub-stations is 1.76 times more likely to have a sustained compliant case, in comparison to a municipal police department with two or more police substations. Similar conclusions were drawn from the results presented in Models 7 and 9.

As for the percentage of dismissed complaints, the results in Models 4, 5, and 6 (see Table 5.2) suggest that spatial differentiation has a negative impact, but it was not

significant. I found no statistical evidence to suggest that there is a negative association between spatial differentiation and the percentage of dismissed complaints, suggesting that further research is warranted. Since spatial differentiation is a measure of department size, this suggests that larger police departments receive more force complaints and the number of dispositions is larger. These results are consistent with previous research (Hickman & Piquero, 2009; Worrall, 2002).

Occupational differentiation: Greater occupational differentiation is also associated with larger police departments. When the size of municipal police departments is increased, it can be expected that the number of force complaints and their dispositions will increase. The findings presented in Models 2, 4, and 9 demonstrate that an increase in occupational differentiation is associated with a negative rate of citizen complaints ($\beta = 0.01$), a positive effect on the percentage of dismissed complaints (i.e., $\beta = 0.36$), and a negative effect on the percentage of sustained complaints (i.e., $\beta = -0.01$).

In Model 2 (see Table 5.1), the percentage of occupational differentiation has a negative impact on the number of citizen complaints per 100 officers. The negative impact is statistically significant at the 0.10 level. Substantively, the finding in Model 2 suggests that a one-unit increase in the percentage of non-sworn employees results in a decrease in the median number of complaints per 100 officers (i.e., $\exp(-0.01)$). Even though the impact of non-sworn employees is statistically significant at the 0.10 level, it has a very small impact on the number of citizen complaints per 100 officers. A similar conclusion may be drawn from the analysis presented in Model 4 (see Table 5.2), which suggests that a one-unit increase in the percentage of non-sworn employees results in an

average increase of .36% of dismissed complaints, when the other variables are held constant.

However, the results from Model 9 (see Table 5.3) suggests that a one-unit increase in the percentage of non-sworn employees results in a decrease in the log likelihood of having a sustained complaint case (i.e., $\exp(-.01)$). In addition, the impact of non-sworn employees on the log likelihood of having a sustained complaint case is not statistically significant; and, even if the statistical test was significant at the conventional level, the likelihood of having a sustained complaint case would have been lower than the likelihood of not having a sustained complaint case. While Worrall (2002) found that department size has a positive significant correlation with the number of force complaints, Hickman and Piquero (2009) found that occupational differentiation is not correlated with the number of force and sustained complaints. Hence, the results of this study are not consistent with the previous research, in terms of occupational differentiation.

Hierarchical differentiation: Greater hierarchical differentiation is also associated with greater department size. When the size of a municipal police department is increased, it can be expected that the number of force complaints and their dispositions will be increased. The findings in Models 7, 8 and 9 (see Table 5.3), show that greater hierarchical differentiation is associated with a higher probability of having a sustained complaint case. In other words, the hierarchical differentiation ratio has a statistically significant impact on the likelihood of having a sustained complaint case. Substantively, Model 8 suggests that, if the other variables are held constant, a one-unit increase in the

hierarchical differentiation ratio results in an average increase in the log-odds of having a sustained complaint case by a factor of 1.23 (i.e., $\exp (.21)$). On the other hand, no evidence was found concerning the impact of hierarchical differentiation on the number of force complaints (see Table 5.1) and the percentage of dismissed complaints (see Table 5.2). While Worrall (2002) found that department size has a positive significant association with force complaints, Hickman & Piquero (2009) found that hierarchical differentiation has no association with either force or sustained complaints. Hence, the results of this study are not consistent with the previous research, in terms of hierarchical differentiation.

Functional differentiation: It is related to the level of specialization within an organization, and is operationalized as the number of special units within a police agency. Greater values indicate a greater functional differentiation, and greater functional differentiation is associated with larger police departments. A greater functional differentiation may also be associated with more force complaints and a larger percentage of dismissed and sustained complaints. However, in this research, there is no statistical evidence to suggest that functional differentiation has an impact on the number of force complaints (see Table 5.1) and their dispositions (see Table 5.2). While Worrall (2002) found that department size has a positive significant correlation with the number of force complaints, Hickman & Piquero (2009) found no evidence to suggest that functional differentiation is correlated with the number of force complaints and the percentage of sustained complaints. Hence, the results of this study are consistent with the research of

Hickman & Piquero (2009), but not with the research of Worrall (2002), in terms of functional differentiation.

Formalization: It is defined here as the extent to which departments have formalized their administrative procedures. It was operationalized as the total number of officially written policies in a police department. Higher values for this variable were associated with a greater tendency for formalization in a police department, and a greater degree of formalization may be related to more use of force complaints. Having a greater number of written policies, may also indicate that a police department serves a large population and has more sworn officers, which, in turn, may lead to more force complaints.

The evidence presented in Models 7, 8, and 9 (see Table 5.3) suggests that a greater degree of formalization is associated with a higher log likelihood of having a sustained complaint case. In other words, the extent to which formalization occurs in a municipal police department, on average, has a positive impact on the likelihood of having a sustained complaint case. For example, the findings in Model 8 suggest that a one-unit increase in the number of officially written policies, results in an increase in the log likelihood of having a sustained complaint case, by a factor of 1.15 (i.e., $\exp(.14)$). However, there is no statistical evidence to suggest that the degree of formalization has an impact on the number of force complaints (see Table 5.1) and the percentage of dismissed complaints (see Table 5.2). Cao, Deng, & Barton (2000) found no evidence to suggest that having a less-than-lethal policy had an effect on force complaints. Also,

Hickman & Piquero (2009) reported similar results from their research. Hence, these findings were consistent with those from previous research.

Administrative Controls

The concept of administrative controls is not new to the principal-agent approach. This is because an effective control mechanism usually produces a higher degree of compliance. This concept may be documented in this research by the presence of an internal affairs unit in an organization and a performance monitoring system, the maintenance of a separate investigation policy and a citizen administrative appeal by an organization, and noting which police departments allow the process of collective bargaining.

Internal affairs unit: The literature suggests that police agencies with an internal affairs unit have more use of force complaints, because its presence in a police department indicates that citizen complaints are received, processed, and investigated according to more formal policies and procedures (Hickman & Piquero, 2009; Worrall, 2002). An internal affairs unit may increase citizens' access and trust in the internal investigation process; hence, citizens may make more formal complaints.

Based on the results in Model 8 (see Table 5.3), there is evidence to suggest that an internal affairs unit has an impact on the likelihood of having a sustained complaint case (i.e., $\beta = 0.40$). For instance, municipal police departments with internal affairs units have a higher likelihood of having a sustained complaint case, in comparison to municipal police departments without an internal affairs unit. On average, municipal police departments with an internal affairs unit have a higher likelihood of having a

sustained complaint case, by a factor of .13 (i.e., $\exp (.40 - 2.44)$), while the log-odds factor for police departments without an internal affairs unit is 1.49 (i.e., $\exp (.40)$), if the other variables are held constant. However, there is no statistical evidence to suggest that the presence of an internal affairs unit has an impact on the number of force complaints (see Table 5.1) or dismissed complaints (see Table 5.2). The results of this study are not consistent with the previous literature, in that researchers found a significant positive association between the presence of an internal affairs unit and the number of force complaints (Hickman & Piquero, 2009; Worrall, 2002).

Performance monitoring system: The purpose of a computer-based personnel performance monitoring or assessment system (such as an early warning or early intervention system) in a police agency is to monitor and respond to behavior patterns of officers, before they become problematic. Removing a problematic officer from the line of duty may decrease the number of force complaints. However, there is no statistical evidence to suggest an association between the presence of a performance monitoring system and the number of force complaints (see Table 5.1) and their dispositions (see Table 5.2). These results are consistent with Hickman & Piquero's study (2009) that also found no association, but are inconsistent with Worrall's (2002) study that found an association between the presence of performance monitoring systems and an increased number of force complaints.

Separate investigation policy: A policy regarding the use of separate investigations can increase citizen trust in the process and transparency of complaint investigations. Thus, the presence of separate investigation units may increase the

number of force complaints. However, there is no statistical evidence to suggest that a separate investigation policy has an impact on the number of force complaints (see Table 5.1) and their dispositions (see Table 5.2). One of the reasons for this may be attributed to the fact that citizens may not be aware of separate investigation policies. So this type of investigation may not have an impact on the decision made by citizens, to file an official complaint. The results of this study are consistent with the research of Hickman & Piquero (2009).

Citizen administrative appeal: The presence of a “citizen administrative appeal” indicates whether citizens have the right to an administrative appeal when their complaints are dismissed, especially in cases regarding the inappropriate use of force. Offering citizens an opportunity to request a review of administrative decision making, creates a transparent process. Hence, the presence of a citizen administrative appeal demonstrates a police department’s commitment to professionalism (Hickman & Piquero, 2009). It can be expected that municipal police departments having citizen administrative appeal procedures will record more force complaints than those without the procedure.

The results in Models 7, 8 and 9 present evidence that the presence of a citizen administrative appeal has a statistically significant impact on the log likelihood of having a sustained complaint case. For example, based on the analysis presented in Model 7, when all other variables are held constant, if citizens have the right to an administrative appeal, in cases involving the inappropriate use of force, these police departments would have a lower likelihood of having a sustained complaint case (i.e., $\beta = -2.40$), in comparison to municipal police departments without a citizen administrative appeal (i.e.,

$\beta = -2.07$). The results are consistent with Models 8 and 9, in Table 5.3. On the other hand, there is no evidence to suggest that the citizen administrative appeal has an impact on the number of force complaints (see Table 5.1) and dismissed complaints (see Table 5.2).

Collective bargaining: The presence of “collective bargaining” agreements within a police department signifies the importance of police officers negotiating their rights as employees. Collective bargaining agreements can provide an aggressive defense for an accused officer. Hence, police agencies that provide collective bargaining for their sworn officers may have fewer sustained, but more dismissed complaints, than other agencies.

In Models 7 and 9 (see Table 5.3), there is evidence to suggest that collective bargaining has an impact on the likelihood of having a sustained complaint case. Collective bargaining has a negative impact on the likelihood of having a sustained complaint case. The presence of collective bargaining in municipal police departments will lead to a lower probability of having a sustained complaint case, in comparison to municipal police departments without collective bargaining. On average, municipal police departments with collective bargaining had a lower probability of having a sustained complaint case (i.e., $\beta = -2.33$), in comparison to municipal police departments without collective bargaining (i.e., $\beta = -0.26$), when the other variables were held constant. On the other hand, no statistical evidence was found to indicate that collective bargaining had an impact on the number of force complaints or cases involving dismissed complaints. The results of this research are consistent with Hickman & Piquero’s (2009)

research, in that they found a significant positive correlation between collective bargaining and the percentage of sustained complaints.

Environmental Factors

The environmental factors are important to take into account, because they may increase or decrease the number of force complaints, by giving citizens better access to the complaint process. In addition, employing a large number of sworn officers, having a greater crime rate in the area of jurisdiction, and serving a large population, may increase the number of force complaints, since these factors increase the number of interactions between citizens and sworn officers.

Citizen complaint review board: The presence of a “civilian complaint review board” in a municipal police department, as discussed in previous research, makes a difference in the behavior of law enforcement agencies, since it facilitates citizen access to the complaint process. It may be expected to increase the number of use of force complaints (Cao, Deng, & Barton, 2000). In addition, a CCRB may represent greater oversight over the complaint process, which may explain the greater percentages of sustained complaints (Hickman & Piquero, 2009).

The results in Models 1, 2, and 3 (see Table 5.1) show that the presence of a civilian complaint review board (CCRB) in the area of jurisdiction of a municipal police department, had a significant impact on the number of citizen complaints. For instance, in Model 3, the municipal police departments with a CCRB had a higher number of complaints per 100 officers, in comparison to police departments without a CCRB. This finding suggests that facilitating access to the complaint process often leads to a higher

number of citizen complaints (Cao, Deng, & Barton, 2000). Specifically, if all other variables are held constant, those municipal police departments with a CCRB had a median number of citizen complaints per 100 officers of 4.90 (i.e., $\exp(1.59)$), while the median number of complaints per 100 officers for police departments without CCRB was 1.36 (i.e., $\exp(.31)$). The police departments with a CCRB had a median number of citizen complaints that was about 72% higher than for agencies without a CCRB. However, there is no statistical evidence to suggest that having a CCRB has an impact on the number of dismissed complaints (see Table 5.2).

In Models 7 and 8 (see Table 5.3), the results suggest that the presence of a CCRB has a positive impact on the likelihood of a municipal police department having a sustained complaint case. For instance, based on the analysis presented in Model 8, the average probability of having a sustained complaint case is higher for municipal police departments with a CCRB, in comparison to those without a CCRB. This finding suggests that, when municipal police departments received a high volume of force complaints, the chances of having a sustained complaint case was highly probable. Specifically, when the other variables were held constant, municipal police departments with a CCRB had a lesser likelihood of having a sustained complaint case, by a factor of .12 (i.e., $\exp(-2.14)$), while those departments without a CCRB had a greater likelihood of having a sustained complaint case, by a factor of 1.35 (i.e., $\exp(.30)$) In other words, if all the other variables were held constant, a municipal police department without a CCRB was 1.35 times more likely to have a sustained compliant case, than a municipal police department with a CCRB.

The results of this research are consistent with Cao, Deng, & Barton's (2000) study that found the presence of a CCRB to be associated with a large number of force complaints, but inconsistent with Worrall's (2002) and Hickman & Piquero's (2009) studies that found no association between the presence of a CCRB and the number of force complaints and percentage of sustained complaints.

Violent crime rate: Violence-producing events may explain brutal police behavior. When suspects try to outrun and hide from an approaching police officer, they are more vulnerable to police brutality (Crank, 2004). The "violent crime rate" is another important factor to consider, since inappropriate force may be applied by the police, when responding to violent crime incidents. A higher rate of violent crime would likely be associated with more citizen complaints. A large number of citizen complaints may lead to an increase in the percentage of dismissed and sustained complaints.

In Models 1, 2, and 3 (see Table 5.1), the results show that the violent crime rate has a significant effect on the number of citizen complaints. Specifically, when all the other variables are held constant, an increase of one unit of violent crime per 10,000 citizens will lead to an increase in the median number of citizen complaints by slightly more than 1 unit (i.e., $\exp(0.002)$). The effect is statistically significant at the 0.05 and 0.10 levels. This coefficient demonstrates that the violent crime rate has a relatively small impact on the number of force complaints. In Models 4, 5, and 6 (see Table 5.2), the results show that the violent crime rate has a negative effect on the percentage of dismissed complaints. Specifically, the results indicate that an increase in the violent

crime rate of one unit per 10,000 citizens, will lead to a decrease in the percentage of dismissed complaints, by about .06 points.

In Models 7, 8, and 9 (see Table 5.3), which are based on the Heckman's two-step analysis, the violent crime rate has a positive impact on the likelihood of a municipal police department having a sustained complaint case. Specifically, when all the other variables are held constant, a one-unit increase in the violent crime rate will result in an increase in the log-odds of having a sustained complaint case, by a factor of slightly more than 1 (i.e., $\exp(0.004)$). This coefficient demonstrates that the effects of the violent crime rate on the likelihood of having a sustained complaint case, are statistically significant at the 0.05 and 0.01 levels, but the effects are relatively small. The results of this research are consistent with Worrall's (2002) and Hickman & Piquero's (2009) studies that found a positive significant correlation between the violent crime rate and the number of force complaints and percentage of sustained complaints.

Owner-occupied households: The socio-economic characteristics of local communities also matter. The percentage of owner-occupied households represents the level of homeownership within in a city, and is an indicator of neighborhood stability. It can be expected that a greater percentage of owner-occupied households will be associated with fewer use of force complaints. The general expectation is that neighborhood stability is associated with a lower complaints rate, because of police force familiarity with the citizens and the needs of the local neighborhoods. Moreover, residents living in a neighborhood over an extended period of time are more likely to ensure the general welfare of their neighborhood, by participating in neighborhood-watch

or other local initiatives. Such initiatives can lead to a reduction in the number of crimes and, thus, a lower number of force incidents and citizen complaints (Hickman & Piquero, 2009).

The results in Model 1 show that an increase in the percentage of owner-occupied households had a significant negative impact on the number of force complaints. Specifically, when all the other variables are held constant, a one percentage increase in the number of owner-occupied households will result in a decrease of the median number of citizen complaints, by about .99 (i.e., $\exp(-.01)$). However, there is no statistical evidence to suggest that the percentage of owner-occupied households has a negative impact on the percentage of dismissed complaints (see Table 5.2) or the likelihood of sustained complaints (see Table 5.3). The results of this research are not consistent with Hickman & Piquero's (2009) study that found no association between the percentage of owner-occupied households and the number of force complaints.

Sworn officers per 10,000 citizens: Another factor that assesses a police department's organizational capacity is the number of "sworn officers" per 10,000 residents. The inappropriate use of force is applied only by sworn officers; hence, the number of sworn officers must be controlled in the model. Police departments employing more sworn officers may receive more citizen complaints, in comparison to police departments that employ fewer sworn officers. Greater values for this variable may be associated with a higher number of force complaints, and higher numbers of complaints may lead to a greater percentage of dismissed and sustained cases.

The results in Table 5.2 suggest that an increase in the number of sworn officers per 10,000 citizens had a negative effect on the percentage of dismissed complaints. Specifically, when the effect of all the other variables is held constant, a one-unit increase in the sworn officers per 10,000 citizens, results in a decrease in the percentage of dismissed complaints, by about 44%. In Models 7, 8, and 9 (see Table 5.3), which are based on the Heckman's two-step analysis, the number of sworn officers per 10,000 citizens had a negative impact on the likelihood of a municipal police department having a sustained complaint case. Specifically, when all the other variables were held constant, a unit increase in the number of sworn officers per 10,000 citizens, resulted in an increase in the log-odds of having a sustained complaint case, by a factor of slightly more than .98 (i.e., $\exp(-.02)$). This coefficient demonstrates that the effects of the number of sworn officers per 10,000 citizens on the likelihood of having a sustained complaint case, are statistically significant at the 0.10 and 0.05 levels, but the effects are relatively small.

Decreased percentages of sustained complaints may suggest that some officers gave witness statements in favor of their fellow officers, so that the accused officers were found innocent. The results of this research are consistent with Hickman & Piquero's (2009) study, reporting that an increased number of police officers decreases the percentage of sustained complaints.

Minority representation ratio: The theory of representative bureaucracy suggests that passive representation leads to active representation (Mosher, 1968). Specifically, increasing the number of sworn officers from minority groups may decrease the number of force complaints. Citizen complaints may be higher in cities with police officers who

do not mirror the ethnic makeup of the population they serve (Hickman & Piquero, 2009). Scholars have argued that larger numbers of officers representing minority groups, in a municipal police department, have a negative impact on the number of citizen force complaints. For instance, the previous literature suggests that as the number of sworn officers from minority populations approaches the percentage of minority populations in cities, use of force complaints are less likely to be filed (Cao, Deng, & Barton, 2000; Cao & Huang, 2000; Hickman & Piquero, 2009; Worrall, 2002).

The finding in Model 2 contradicts the prediction of the theory of representative bureaucracy, specifically, the effect of minority representation on the number of citizen complaints. When all the other variables are held constant, a one-point increase in the ratio of minority representation will result in an increase in the median percentage of citizen complaints per 100 officers, by about 1.42 (i.e., $\exp(.35)$). On the other hand, there is no statistical evidence to suggest that minority representation has an impact on the number of dismissed complaints (see Table 5.2) or the likelihood of having a sustained complaint case (see Table 5.3).

In terms of the number of force complaints, the results of this research is not consistent with Worrall's (2002) and Hickman & Piquero's (2009) studies that found no association, but is consistent with Cao, Deng, & Barton's (2000) study that found a positive significant correlation between the percentage of black officers and the number of force complaints.

Conclusion

In general, the evidence from the analyses suggests that surveillance technology has an impact on the number of force complaints against municipal police departments, but the results for specific effects are rather mixed. First, in terms of the number of sustained complaints, the analysis suggests that municipal police departments having in-car cameras, in 2003, tended to have a higher percentage of sustained complaints, in comparison to municipal police departments without in-car cameras or CCTV. The results also suggest that the usage of both types of surveillance technology, in 2003 (i.e., in-car cameras *and* CCTV), by municipal police departments had a positive impact on the percentage of sustained citizen complaints.

When I extended the analysis to include the experience of police departments with CCTV since 2000, the analysis suggested that municipal police departments that had some experience with CCTV (in 2000) tended to have a higher percentage of sustained complaints, in comparison to municipal police departments that had no experience with CCTV (i.e., without CCTV operating in 2000 and 2003). In addition, when I also extended the analysis to include the experience of police departments with in-car cameras since 2000, the analysis suggested that municipal police departments that had some experience with in-car cameras, both in 2000 and 2003, also tended to have a higher percentage of sustained complaints, in comparison to municipal police departments that had no experiences with in-car cameras (i.e., without in-car cameras, in 2000 and 2003).

Second, when I extended the analysis to include the experience of police departments with CCTV since 2000, the analysis suggested that municipal police

departments that had some experience with CCTV (in 2003) tended to have a higher number of citizen complaints, in comparison to municipal police departments that had no experience with CCTV (i.e., without CCTV operating in 2000 and 2003). Third, interestingly, contrary to the principal-agent and routine activity theories, no evidence was found to show that surveillance technology has an impact on the percentage of dismissed complaints.

Control variables also have an impact on the number of force complaints and their dispositions. There is evidence that municipal police departments with two or more police stations received more citizen complaints and sustained more force complaints, than police departments with one, or without any, police stations. In terms of an internal affairs unit, municipal police departments with an internal affairs unit have a higher likelihood of having a sustained complaint, in comparison to municipal police departments without an internal affairs unit. Also, a citizen administrative appeal process has a statistically significant impact on the log likelihood of having a sustained complaint case. In terms of the presence of a police union, the presence of collective bargaining in police departments results in a lower probability of having a sustained complaint case, in comparison to departments without collective bargaining. In terms of a Civilian Complaint Review Board (CCRB), municipal police departments with a CCRB receive a larger number of complaints and have a larger percentage of sustained complaints, in comparison to departments without a CCRB. In terms of violent crime, an increase in the violent crime rate, on average, tends to result in an increase in the number of citizen complaints, but has a negative effect on the percentage of dismissed complaints;

however, it also has a positive impact on the likelihood of a department having a sustained complaint. An increase in the percentage of owner-occupied households has a negative impact on the number of force complaints. An increase in the number of sworn officers per 10,000 citizens results in a decrease in the percentage of dismissed complaints. Finally, the presence of sworn officers from minority populations increases the number of citizen complaints.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

This dissertation examines the impact of surveillance technology on the behavior of municipal police departments, in terms of the number of citizen complaints that they receive. The main hypotheses of the study assert that surveillance technology will ensure that municipal police officers behave appropriately when dealing with the public. The principal-agent theory predicts that surveillance technology may have an impact on municipal police departments, by reducing the amount of inappropriate behavior taking place among police officers. Similarly, the routine activity theory also predicts that surveillance technology may reduce the likelihood of inappropriate behavior by citizens or suspects against law enforcement officers, during an encounter. In a given situation, a surveillance camera can function as a control mechanism, monitoring system, and intervening force, where citizens, as well as police officers, perceive a certain level of risk, if they are caught behaving inappropriately during an encounter.

The effect of surveillance technology on the behavior of police officers depends on the risks involved in getting caught and the severity of the punishment, if found guilty. If police officers perceive that the likelihood of legal sanction for their inappropriate or illegal behavior is greater in the presence of surveillance technology, it can be expected that surveillance technology will deter them from behaving inappropriately. In this regard, the presence of an effective monitoring system may deter inappropriate behavior by police officers, reduce the number of sustained complaints, and increase the number of

dismissed complaints. Furthermore, the usage of real-time surveillance technology permits a police department to more easily handle uncooperative and dangerous citizens, by allowing them to immediately deploy a sufficient number of police officers to the crime scene, providing additional support to ground/field officers, and assessing the risk associated with uncooperative suspects. In addition, when police officers deal with uncooperative suspects, the likelihood of unfounded complaints of police brutality are decreased, with the use of this surveillance technology.

According to the routine activity theory, surveillance technology can also influence the behavior of citizens, because potential offenders tend to avoid performing criminal acts in the presence of surveillance technology and, thus, have fewer opportunities to commit crimes. On the other hand, if citizens do not perceive the surveillance technology to be an “interfering force”--acting as a deterrent or intrusive to criminal intent--it will not prevent them from committing crimes, resisting arrests, or being abusive to police officers. If the arrested individuals believe that they will be punished, it is also possible that they might file official complaints in order to recover money or some other type of compensation from police agencies, if the evidence shows that officers have not followed departmental procedures. In addition, offenders may file an intentional complaint in hopes that the charges against them will be reduced (Snow, 2007). In these cases, the effect of surveillance technology on the number of citizen complaints may be decreased, in comparison to cases concerning the effects on strategic or opportunistic behavior of offenders. In contrast, citizens or suspects may not file

official complaints of police brutality, if they believe that the officer will not be punished, even though a videotape showing the illegal behavior of the accused officer exists.

The extent to which surveillance technology has an effect on the behavior of officers, as well as citizens, is important to examine because investment in the technology, and adoption and implementation of the programs, demonstrate that this is not just a symbolic gesture to address the problems of accountability. One reason for the adoption of surveillance technology in policing may be that public money has been thrown at a perceived problem, in an attempt to solve it. Another reason for introducing surveillance technology, and thus worth studying, is that there is ambiguity in determining what is meant by the use of excessive force by the police, particularly when the life of an officer is at stake. Pate & Fridell (1993, p. 19), for example, define legal or appropriate force as “the amount of physical force is more than reasonably necessary to affect a legal police function.” This definition suggests that, even though the lives of the officers are at stake, they are expected to use appropriate force, and that the use of excessive force cannot be justified, only, by events that put ones life into danger. Yet, police officers are often faced with the dilemma of when to use excessive force, when offenders behave provocatively during an arrest or an encounter.

Another important reason for adopting surveillance technology is based on the concept that police discretion or departmental policies, alone, are not sufficient to control the behaviors of law enforcement officers (IACP National Law Enforcement Policy Center, 2001b; IACP, 2005; Walker, 2005). This is because wide discretionary powers and less supervision often lead to police misconduct or misuse of police authority

(Dierickx, 2008; Langworthy & Travis, 1994). Even though police organizations employ supervisors to control and direct the officers' behavior, given the nature of policing, police officers often conduct their work in low visibility areas, away from managerial scrutiny. This suggests that the very nature of police work reduces the impact of supervisory control on the behavior of officers.

For the most part, the presence of large numbers of citizen complaints and the inexperience of police officers are additional problems that have led to the introduction of surveillance technology (Abshire, 2009; Hickman, 2006). Except in cases of racial profiling, it is expected that younger officers will behave in the same manner as senior officers in the presence of surveillance technology (Abshire, 2009). The extent to which the behavior of young officers is consistent with experienced or older officers is difficult to determine. In general, police officers must not be the initiators of actions that result in negative publicity, because aggressive responses to situations by the police may provoke even the law abiding people. For the most part, a large number of citizen complaints is often used as an indicator of negative police-public relations, unresponsive police services, and the unresponsiveness of police management to citizens' concerns. Hence, surveillance technology can be used both as an administrative tool to respond to citizen complaints by police chief executives, as well as to supply training materials for relatively young police officers.

General Findings and Discussion

In general, the evidence from the analyses suggests that surveillance technology has an impact on the number of force complaints and their dispositions, but the results for

specific cases are rather mixed. First, in terms of the usage of in-car and CCTV cameras, in 2003, the analysis suggests that municipal police departments having in-car cameras, in 2003, tend to have a higher percentage of sustained complaints in comparison to municipal police departments that did not have in-car cameras or CCTV, in 2003. In addition, the results also suggest that the usage of both types of surveillance technology, in 2003 (i.e., in-car cameras *and* CCTV), by municipal police departments had a positive impact on the percentage of sustained citizen complaints. In other words, municipal police departments that used both in-car and CCTV cameras, in 2003, sustained more force complaints than police departments that did not use in-car and CCTV cameras, in 2003.

Also, when I extended the analysis to include the experiences of municipal police departments with in-car cameras and CCTV, since 2000, the analysis yielded similar findings for sustained complaints. Municipal police departments using in-car cameras, in 2000 and 2003, tended to have a higher percentage of sustained complaints in comparison to municipal police departments that did not use in-car cameras, in 2000 and 2003. Similar results were found for municipal police departments that used in-car cameras only in 2000, on average, and they also sustained more force complaints than municipal police departments without in-car cameras, in 2000 and 2003. I also found that those municipal police departments that had CCTV cameras only in 2000 tended to have a higher percentage of sustained complaints, in comparison to municipal police departments without CCTV, in 2000 and 2003.

However, while investigating the impact of surveillance technology on the number of force complaints, no evidence was found to suggest that in-car cameras had a negative impact on the number of force complaints. When I extended the analysis to include the experiences of municipal police departments with CCTV since 2000, the analysis suggested that, on average, municipal police departments having some experiences with CCTV (in 2003) tended to have a higher number of citizen complaints, in comparison to municipal police departments that have no experiences with CCTV (i.e., without CCTV, in 2000 and 2003). On the other hand, while investigating the impact of surveillance technology on the percentage of dismissed complaints, no evidence was found to show that in-car cameras or CCTV have an impact on this type of complaint.

My findings highlight important causality effects for the control variables of organizational structure, administrative controls, and environmental factors on the number of complaints filed against municipal governments. Considering the organizational factors, municipal police departments with two or more police stations received and sustained more citizen use of force complaints than municipal police departments with only one, or without any, police stations. The analysis suggests that the increased accessibility or proximity of a police building to citizens resulted in an increase in the number of citizen complaints. Furthermore, when police personnel was comprised of a large percentage of non-sworn officers, this was associated with a lower number of citizen complaints, with a larger percentage of dismissed complaints, and with a lower percentage of sustained complaints. Greater hierarchical differentiation was only associated with a higher percentage of sustained complaints, suggesting that if a police

station is in closer proximity to the community, the likelihood of gaining access to the complaint process is greater, because the availability of police stations may reduce the travel time to a police facility, allowing citizens to file official complaints more easily.

Considering the administrative factors, municipal police departments with an internal affairs unit have a higher likelihood of having a greater number of sustained complaints, in comparison to municipal police departments without this type of unit. Having a citizen administrative appeal process had a statistically significant impact on the log likelihood of having a sustained complaint case. Municipal police agencies that gave citizens the right to an administrative appeal, in cases involving the inappropriate use of force, had a lower likelihood of having a sustained complaint, in comparison to departments that did not offer this appeal process. The presence of collective bargaining in municipal police departments also lead to a lower probability of having a sustained complaint case, in comparison to municipal police departments without collective bargaining.

Considering the environmental factors, the municipal police departments with a Civilian Complaint Review Board (CCRB) had a higher number of complaints, in comparison to police departments without a CCRB. This finding suggests that facilitating access to the complaint process often leads to a higher number of citizen complaints. In addition, municipal police departments with a CCRB tended to have a higher likelihood of having a sustained complaint case, in comparison to those without a CCRB. This finding suggests that, when municipal police departments receive a large volume of force complaints, the chances of having a sustained complaint is highly probable. An increase

in the violent crime rate, in general, tended to result in an increase in the number of citizen complaints. The violent crime rate has a negative impact on the percentage of dismissed complaints for municipal police departments, but a positive one for the likelihood of having a sustained complaint, suggesting that violence-producing events may influence the incidence of police brutality. When suspects try to outrun and hide from an approaching police officer, they are more vulnerable to police brutality (Crank, 2004).

The percentage of owner-occupied households in the area of jurisdiction of the municipal police department often indicates neighborhood socio-economic and residential stability. My analysis suggests that an increase in the percentage of owner-occupied households has a negative impact on the number of force complaints. Also, the analysis suggests that an increase in the number of sworn officers per 10,000 citizens results in a decrease in the percentage of dismissed complaints. One explanation for this may be attributed to the fact that having a large number of sworn officers allows a police department to provide the necessary backup manpower to control an uncooperative suspect without using excessive force. Representative bureaucracy theory predicts that if the percentage of sworn officers from a minority population is similar to the percentage of that group in the general population, the number of use of force complaints will be decreased. However, the finding contradicts the prediction of the theory of representative bureaucracy. It was found that the number of force complaints increases while the ratio of minority representation increases.

Major Contributions

This dissertation contributes to the theories of public administration by using the principal-agent theory, in assessing the impact of surveillance technology on preventing or eliminating improper behavior by police officers and their organizations. In particular, the theory predicts that the inappropriate behavior of police officers (i.e., in the use of inappropriate force or police brutality) can be prevented when surveillance technology is present, by assuming that the police executives will sanction or punish their officers who display this behavior. However, if the officers perceive that it is unlikely that they will be detected, they will not change their behavior.

Alternatively, it could be suggested that, even in the presence of surveillance technology, the behavior of police officers may not change. For example, officers may not be punished, if the culture of their police organization protects them against any legal action. This is not uncommon among police departments with a strong sense of police solidarity. For instance, Stone & Ward (2000) regard police organizational culture as a cultural obstacle to accountability. Because police officers protect each other and guard against external criticism, the solidarity of police personnel is frequently cited as a cultural obstacle to accountability, even when corruption and police brutality occur. While giving a false eyewitness statement, favoring a fellow officer, can be counted as police solidarity at the individual level, cutting out part of a videotape, captured by an in-car camera, that includes a police beating, and then giving a copy of this videotape to the prosecutor, can be counted as police solidarity at organizational level (Associated Press, 2009. May 20; Robinson, 2009).

My research suggests that the institutional environments of public agencies are important in explaining the behavior of police departments. Institutional environments are created from rules, regulations, and policies, and may have either positive or negative impacts on the behavior of police departments. When an institution does not enforce its written rules, inappropriate behavior by officers is likely to occur. Hence, as a tool to ensure police compliance, the presence of surveillance technology may not have an impact on the behaviors of sworn officers because, when police personnel believe that they are above the law and immune to punishment, no control mechanism or interfering force can stop them from acting brutally against a suspect or offender (Skolnick & Fyfe, 1993). In this regard, the experience of a police department in using surveillance technology also matters.

This dissertation also contributes to the theory of routine activity, which predicts that an offender will victimize another individual given an opportunity and absence of an interfering force. An interfering force, when present, will deter an offender from victimizing an individual, because it increases the potential risk of being identified and convicted. However, an alternative explanation would suggest otherwise. An offender that expects to serve time in jail may act strategically or opportunistically during an arrest, because he/she has nothing to lose. In order to make an official complaint, he/she may provoke an officer to use an excessive force during an encounter, even though surveillance technology is present. The offender may intend to get the charges against him/her reduced, gain benefits through compensation from the police agency, or take

revenge against the officer. In such situations, surveillance technology may not have an effect on the number of citizen complaints.

For the most part, this research found that, when surveillance technology functions as a control mechanism, monitoring system, or interfering force, it can change the behaviors of individuals, in general, and organizations, in particular, in specific situations. This is because an organization can enforce the law in punishing the inappropriate behaviors of police officers, if captured by surveillance technology, but surveillance technology may not change its organizational culture. At the same time, as suggested by the results, in capturing indisputable and solid evidence, even if it does not deter inappropriate behavior by officers, the usage of surveillance technology increases the percentage of conviction of the accused officers. The results also suggest that an offender's behavior may not be affected by an interfering force, as predicted, because of the opportunistic or strategic behavior of an offender. An offender may use the interfering force to his/her advantage while committing his/her illegal act.

This dissertation also makes several contributions to practices in the field of public administration. First, this research provides evidence showing that surveillance technology has a positive impact on the percentage of sustained complaints, suggesting that surveillance technology is effective in recording and getting convictions of officers accused of violating the use of force policies of their municipal police departments. The finding also indicates that municipal police departments that implement surveillance technology are responsive to the needs of their local communities. For instance, citizens who are beaten brutally can expect their government to punish the accused officers,

emphasizing the need for police executives to be responsive to the needs of all citizens, in sanctioning inappropriate behavior by their police officers. Surveillance technology has the capacity to fulfill the needs of the citizens, by producing solid evidence to convict offenders or delinquent officers.

Another contribution to the field is that there is evidence to suggest that CCTV has a positive impact on the behavior of municipal police departments. For instance, I found the number of citizen complaints to be higher among police departments that introduced CCTV, suggesting that, if citizens perceive that officers are likely to get punished, based on videotape evidence, they are more likely to file official complaints. Bearing this in mind, police organizations should use surveillance technology as a means to build community trust and, thus, signal a strong commitment to integrity. In addition, in a democratic society, it is expected that public organizations will be responsive to the needs of citizens, by monitoring and sanctioning their administrative and field personnel accordingly. The introduction of surveillance technology, as part of their monitoring mechanism, indicates a commitment by police executives to resolve the inappropriate or illegal behavior of their sworn officers.

Furthermore, from a citizen's perspective, police executives need to build public trust through police organizations and services, because the cooperation and support of the public justifies the amount of public funding associated with policing activities. If citizens have confidence in their police organizations, the number of citizen complaints regarding the inappropriate use of force can be reduced. On the other hand, negative police-public relations may lead to uncooperative citizen behavior that impedes other

efforts to ensure law and order in local communities. If citizens are reluctant to cooperate with the police, there is a strong likelihood that the police agency will not be successful in fighting crimes or conducting other types of investigations. Citizen complaints can be considered as a type of general feedback about the quality of police services. If a police department receives a large number of complaints from citizens, it is an indicator that the police department is not performing well. A large number of citizen complaints can also indicate that the types of services provided by police departments are not responsive to the needs of the local communities, and that, police chiefs and executives ignore the internal administrative and personnel problems within their organizations.

Moreover, my study contributes to the field of public administration, based on the argument that surveillance technology---as an administrative tool---can shift the balance of power towards greater benefits for the citizens. The availability of videotaped evidence may instill a sense of justice and trust in the conduct of the police officers among citizens. Surveillance technology encourages citizens to trust their law enforcement agencies, increases the satisfaction levels of citizens, and provides clues as to whether the amount of public spending was justified. Stone & Ward (2000, p. 16) argue that police officers patrolling and responding to emergency calls “are the most visible representatives of a government to its people,” suggesting the importance of gaining public trust in ensuring the responsiveness of police services to the needs of citizens.

This dissertation also contributes to the research method in the field of public administration. Hickman & Piquero’s (2009) study was extended by proposing a different approach to remedy the potential problems of bias estimation of the partial slope

coefficients. While meeting the normality assumption for the percentage of sustained complaints, the log-transformation truncated the data and led to transformational bias. Since statistical analyses based on non-randomly selected samples can lead to incorrect conclusions, this dissertation used the Heckman selection model for truncated data to correct for the selection bias.

The research findings also produced a new argument. Although people are taught self-control in and out of the classroom, introducing various monitoring mechanisms, such as surveillance technology, in the work environment may affect the ability of public employees to use their own powers of discretion. Because of the many external monitoring mechanisms, police officers may not fully develop their abilities to exercise self-control, and they may tend to behave appropriately only in the presence of these monitors. While surveillance technology may solve one problem, it has the potential to create another. Thus, it is desirable that agencies should train their employees to exercise self-control and act appropriately at all times. While teaching ethics to public employees may enhance their ability to exercise self-control, a knowledge of ethics or professionalism may not control or increase the compliance of individual officers with departmental policies. Hence, the introduction of external control or monitoring mechanisms is necessary, but not sufficient, to increase the level of compliance by individual officers.

Limitations of the Study

This research has several limitations. The first is that this study assumes that surveillance technology has an impact on the behavior of municipal police departments,

but it does not evaluate the possibility that the behavior of a police department (independent variable) may actually lead to the adoption of surveillance technology (dependent variable). In other words, the municipal police departments may have adopted the technology to eliminate or reduce citizen complaints about the inappropriate use of force. Another study could be designed to record the impact of the number of force complaints on the adoption of surveillance technology, specifically, when law enforcement agencies believe that force complaints are an important enough problem that they should be reduced or eliminated by adopting surveillance technology.

The second limitation of this study is that pooled time series analysis may be required to conduct the type of analysis that is required to separate the causal effect of surveillance technology. While the number of force complaints and their dispositions were only recently collected through LEMAS 2003 and 2006 datasets, they can be used to investigate the impact of surveillance technology on the number of citizen complaints and their dispositions over time. For example, one question asks to what extent citizen complaints made against municipal police departments that had used surveillance technology since 2003 could reduce the number of complaints in 2006.

The third limitation of the study is that the sample used for this research is probably biased, since it uses data only from municipal police departments that employ 100 or more sworn officers. Although the LEMAS 2003 dataset also surveys municipal police departments that employed less than 100 sworn officers, they were excluded from the study. Even though the number of force complaints and their dispositions were not collected from municipal police departments that employed less than 100 sworn officers,

the number of in-car and CCTV cameras was collected from these agencies. All municipal police departments in the LEMAS 2003 dataset could be used as a sample, by applying Heckman's selection model to control for potential selection bias. This approach, when applied to future studies, could generalize the findings of all municipal police departments in the U.S.

The fourth limitation of this research is that it cannot be assumed that all incidences of the inappropriate use of force occurred in the presence of surveillance equipment. For instance, in the jurisdictions of municipal police departments that used surveillance technology, no evidence was found that the presence of surveillance technology reduced the number of force complaints. In fact, there are other sources of recordings of encounters between citizens and the police which may not be included in the analysis. The "internet" or "youtube.com", for example, host a vast range of video recordings that document in-car or CCTV cameras displaying sworn officers using inappropriate force against citizens or suspects.

The fifth limitation is that all of the patrol cars in a police department may not be equipped with in-car cameras, even though they often have some form of surveillance technology. For instance, according to the LEMAS 2003 dataset, the largest municipal police department in the U.S., the New York Police Department, used 105 in-car cameras and the department's in-car camera usage was coded as a "1" in the dummy variable, even though it has few in-car cameras in comparison to the total number of patrol cars in the department. As a result, even though it was coded in the "1" category, the relatively

small number of in-car cameras, for such a large police department, may not have made a significant impact on the officer's or citizen's behaviors.

Finally, the LEMAS dataset does not include information about how many force complaints were dismissed or sustained based on the videotaped evidence captured by surveillance technology. The LEMAS dataset provide useful insight into the behavior of police officers in the presence of surveillance technology, but does not have sufficient detail to develop causal linkages between the two. A case study of a large municipal police department would provide a mechanism for better linkage specific outcomes of citizen grievance and the role of surveillance technology in those outcomes.

Recommendations for Future Research

Future research in the area of surveillance technology and policing might explore the different types of high-tech facilities used by police agencies in monitoring the behavior of their officers and the public. It might also investigate the adoption of new technologies and the tendency for local police departments to adopt multiple types of technologies, not limited to CCTV or in-car cameras. Other possible areas of study include the adoption of specific surveillance technology in developing countries. For instance, the impact of surveillance technology on the inappropriate use of force could be studied in Turkey, in which surveillance technology has only recently been introduced by the federal government. In addition, pilot projects in Turkey, using in-car cameras, have been initiated in a few municipal police departments, suggesting another possible avenue of research. While data on the impact of in-car cameras on the behavior of police departments has not been generated, CCTV has been used extensively by the Istanbul

Police Department and this line of research could be replicated in Istanbul city. A comparative study--a joint effort between Turkey and the U.S--would also contribute robustly to the research on the impact of surveillance technology.

As a result of this research, some recommendations can also be made for police chief executives or city managers. Administrative responsiveness of the police chief executives is suggested by the fact that the film footages or videotapes that have been recorded by surveillance technology have contributed to the conviction of accused officers. This also highlights the importance of in-car cameras and CCTV. In addition, as the results suggest, there are more sustained force complaints in the presence of surveillance technology; and, as my field work suggests, there are indications that police officers overreact or are unable to control their anger at suspects who are uncooperative or resist arrest. Bearing this mind, an anger management course might be added to the curriculum of in-service training for law enforcement agencies (F. van Tassell, personal communication, September 19, 2009).

I recommend that the use of surveillance technology should be expanded within law enforcement agencies based on the findings in the current research. The findings reveal that citizen complaints are more likely to be sustained in cities that make greater use of surveillance technology. It may mean that if police departments do not use surveillance technology, accused officers who use inappropriate force will be found innocent because of the lack of evidence. Sanctioning officers may increase the willingness of victims of police brutality to file a grievance. It may increase citizens' trust

in law enforcement agencies and increase the willingness of citizens to cooperate with the police.

For instance, the 2002 Police-Public Contact Survey indicates that 75% of citizens experienced force by the police and they thought that the force used by the police against them was excessive, but only 10% of them filed formal citizen complaints against the law enforcement agencies (Hickman, 2006; Hickman & Piquero, 2009). One of the reasons for not filing formal complaints may be due to the lack of evidence to support a claim by the victims of the inappropriate use of force. In the presence of adequate evidence, such as video evidence, citizens may file more formal complaints because they may believe that police chief executives have enough evidence to punish the accused officer.

It is evident that police departments initiate internal investigations, based on citizen complaints of illegal or inappropriate behavior by police officers, even though the video records of these encounters are stored within the police department itself. Also, it was found that officers who believe that their supervisors review regularly the videotapes captured by in-car cameras, tend to improve the amount of courtesy they display to others (IACP, 2005). Another recommendation is for municipal police departments to assign a full-time supervisor to regularly review the videotapes or film footages recorded by surveillance technology. Regular review of the videotapes, by a supervisor in the police department, may improve the conduct of police officers in their work environment.

Finally, the usage of surveillance technology may become a part of community policing. For example, the U.S Department of Justice, Office of Community Oriented Policing Services (COPS) gave federal grants to state law enforcement agencies in 2000,

2001, and 2003, to purchase in-car cameras (Westphal, 2004), which indicated that the usage of in-car cameras can be advantageous to those communities with active community-oriented policing. Such efforts are consistent with recommendations made by the New Public Service movement regarding the active involvement of both police officers and their local communities to reduce crimes (Denhardt & Denhardt, 2003; Ulkemen & Kapti, 2008). The police chief executives can also promote other types of community policing activities, such as neighborhood watch groups and citizen police academies, in addition to the usage of surveillance technology, thereby encouraging the active participation of local residents on issues related to community policing.

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