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POLICE ACCREDITATION

AND

CLEARANCE RATES

by

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ABSTRACT

Purpose – To examine whether accredited police agencies display higher clearance rates than their non-accredited counterparts.

Design/methodology/approach – The study group consists of all municipal police departments operating continuously in the State of Florida from 1997 through 2006. Independent variables capture organizational characteristics for nearly 260 agencies to determine whether becoming accredited improves clearance rates.

Findings – Random-effects tobit analysis suggests that accreditation status does not affect violent and property crime clearance rates. Clearance rates are more influenced by the number of sworn personnel and law enforcement expenditures per capita.

Research limitations/implications – Much of what is currently known about the impact of accreditation stems from anecdotal and testimonial evidence. Still, the industry manages to expand and flourish. A glaring need for sound empirical research is evident.

Practical implication – Instead of advancing the protection of local communities and bringing about meaningful organizational reform, accreditation appears to be a useful tool for bureaucrats who wish to further their own careers.

Originality/value – Advocates link accreditation status to a number of benefits, including better investigatory practices that culminate in more solved cases. Recent academic work suggests that accreditation has dubious benefits, despite claims to the contrary. This study adds to that literature by showing that accreditation also fails to elevate clearance rates.

Keywords – Police, Accreditation, Innovation, Police reform, Performance management

Paper type – Research paper

INTRODUCTION

Being accredited is a coveted status in many fields. It means that an institution or organization has satisfactorily demonstrated to an external oversight body that it meets or exceeds a host of state-of-the-art standards (Southerland, Merlo, Robinson, Benekos, & Albanese, 2007; Thrasher, 1979). Compliance with these “best practices” criteria is associated with greater operational efficiency, outstanding service delivery, and exemplary achievement. A variety of fields (e.g., colleges and universities, hospital administration, law, engineering, counseling and therapy, and accounting) have embraced national and regional accreditation as a mechanism for avoiding mediocrity and promoting excellence. As of late, law enforcement has made overtures to join this movement.

The impetus for upgrading law enforcement agencies began in 1979 when four prominent national groups (International Association of Chiefs of Police, National Organization of Black Law Enforcement Executives, National Sheriffs’ Association, and Police Executive Research Forum) banded together to promote greater police professionalism. These efforts eventually led to the establishment of the Commission on Accreditation for Law Enforcement Agencies (CALEA), which certified its first agency in 1984. Despite an initial wave of interest, enthusiasm soon subsided. While recent figures indicate that over 950 agencies are actively involved in the accreditation process (CALEA, 2009a), the fact remains that 25 years later CALEA has granted its seal of approval to no more than 3 percent of all law enforcement agencies in the United States (Houglan & Mesloh, 2005). This attainment stands in direct contrast to an optimistic projection that CALEA had the potential to accredit just about every agency in this country within two decades of its inception (Mastrofski, 1986).

Much of the reluctance, especially for smaller agencies, to seek CALEA confirmation stems from the time commitment and costs associated with the entire review process (Carter & Sapp, 1994; DuPont, 1993; Kurz & Kelly, 2005). At least seventeen states have tried to counteract this tendency by establishing their own local, and less expensive, versions of accreditation standards. Florida, the location of the present study, is one of those states.

Hardly any systematic information exists about the impact of police accreditation despite the multi-million dollar operation that CALEA oversees¹ and the industry of advisors this enterprise has spawned.² The CALEA website, as well as those of parallel state organizations, relies heavily upon testimonials and anecdotal stories that extol the virtues of accreditation. On the academic side, the limited amount of research that does exist is rife with interpretational difficulties, shrouded with a variety of methodological shortcomings, and replete with simplistic analyses. For example, the Burlingame and Baro (2005) claim that accreditation standards produce greater personnel diversification remains unconvincing in the absence of any control for whether the agencies had fallen under a consent decree in the past. Similarly, reliance upon a series of difference-of-means tests to isolate disparities between accredited and non-accredited agencies (e.g., Hougland & Mesloh, 2005; McCabe & Fajardo, 2001) begs the question of whether the introduction of any control variables would alter the interpretations. As Doerner and Doerner (2009, p. 795) opine, the time is ripe to investigate the benefits of accreditation more stringently.

The current study attempts to respond to this challenge by focusing on the achievement of accreditation status and one form of organizational productivity. A major goal of accreditation is to introduce reforms that refine organizational oversight, implement state-of-the-art practices,

and enhance the delivery of more efficient and effective services. The expectation developed in this paper is that such efforts should become reflected in organizational outputs like improved clearance rates.

THE ACCREDITATION MOVEMENT

When CALEA arrived on the scene, a number of initiatives already were underway to improve personnel quality by instituting more stringent entrance requirements, providing better pre-service training for recruits, and recognizing the need for continuous in-service training for veteran officers. Scant energy was aimed at organizational reform to complement this individual-level focus. In this respect, CALEA was poised to fill an important niche.

The first task that awaited CALEA was to identify aspects critical to discharging a law enforcement agency's mission. Six target areas were isolated (Cotter, 1983, pp. 20-21). They included the philosophy behind the law enforcement function, management and administrative practices, personnel policies, employee deployment and assignments, prisoner control and court-related activities, as well as support functions and technical services. The CALEA staff then developed a series of applicable standards that reflected critical concerns and would help mold or improve organizational practices within each area.

Once an agency decides to seek accreditation, it embarks on a self-study process. This one- to two-year period entails reviewing all policies, procedures, and activities to determine whether the agency satisfies CALEA standards or needs to take corrective actions that will bring it into accordance with these expectations. Compiling documents and supporting evidence that demonstrate alignment with industry standards allows external assessors the opportunity to conduct an independent evaluation of what the agency is doing. After the outside review is

completed, CALEA decides whether to issue its stamp of approval to the agency. The initial accreditation is valid for five years. After that period expires, an agency must demonstrate continued compliance with the original standards and demonstrate how its organizational practices satisfy any new or revised directives.

As mentioned earlier, the time commitment and expenditures associated with seeking national accreditation have proven to be daunting obstacles for some agencies, particularly smaller ones (Carter & Sapp, 1994; DuPont, 1993; Kurz & Kelly, 2005; Mastrofski, 1986, p. 57). These outlays, coupled with dwindling resources, have forced administrators in many agencies to forgo the national credential. In response to this dilemma, at least 17 states have established their own pared-down, less expensive versions of accreditation. Florida is one of those states.

In 1993, the state legislature turned to the Florida Sheriffs' Association and the Florida Police Chiefs' Association for guidance. The Commission for Florida Law Enforcement Accreditation (CFA) was formed under the auspices of these two associations and modeled after CALEA. Like the national process, agencies seeking CFA status must engage in a self-study, satisfy a variety of Florida-specific standards, host an on-site visit from trained assessors, and pass external muster. By the end of 2009, 91 out of the 266 Florida municipal police departments in continuous operation since 1996 had gained the CFA imprimatur.

THE BENEFITS OF ACCREDITATION

CALEA, CFA, and many other state oversight bodies maintain public internet pages that discuss various aspects of accreditation. These web locations typically have a section that features the benefits administrators, community members, and employees can expect to derive

from successful completion of this voluntary self-study process. As Table 1 shows, several common refrains surface when it comes to heralding the virtues of accreditation.

<Insert Table 1 about here>

Probably the most obvious benefit of accreditation is that it requires agencies to commit operational practices to a series of concrete, written directives.³ The ostensible purpose behind this endeavor is to ward off unarticulated improvisation, whereby low-ranking patrol officers make uninformed decisions without appropriate administrative guidance. The more pressing reasons for institutionalizing policy guidelines is to structure decision making and to forestall a judicial finding of deliberate indifference in the event of civil litigation. In other words, the lack of a formal policy does not insulate an agency from being held accountable for the actions of its members. Remaining silent on key issues will only expose the organization to even greater civil liability and a correspondingly larger settlement. An allied derivative of accreditation and periodic re-accreditation is that agencies remain abreast of contemporary developments and embrace industry standards.

Although accreditation guidelines address what topics should receive consideration in the written directives, it is important to recognize they do not dictate the exact procedures these statements should embody. For example, a standard might articulate the need to distinguish full-time from part-time personnel, but it would not impose a specific number of hours governing this classification. Along the same lines, accrediting bodies do not prohibit, nor do they endorse, reliance upon warning shots in a use-of-force policy. However, the assumption is that administrators will visit this topic and the subsequent written directive they develop will relay the ensuing expectations to the membership and the public.

In addition to setting operational procedures, the web sites post several common themes. There is the expectation that a more transparent law enforcement agency will exude greater public confidence, promote community policing, and increase cooperation with local leaders and other governmental units. Finally, employee morale should rise in response to the routinization of personnel decisions, fair and equitable practices, and overall professional treatment.

The picture that Table 1 yields is that the benefits emanating from participation in the accreditation process are consistent and similar from one state to the next. In some instances, these expositions utilize very similar, if not the exact same, language. Hence, it is not unreasonable to expect that accredited agencies would reap some common outcomes. It is suggested that elevated clearance rates should be one gain derived from accreditation.

THE CLEARANCE LITERATURE

There are two ways in which to clear a criminal case according to guidelines the Florida Department of Law Enforcement (FDLE) distributes to all participating law enforcement agencies on behalf of the Federal Bureau of Investigation (FBI). The most common avenue is to arrest a suspect for the incident and then forward the case to the state attorney's office for prosecution (FDLE, 2008a, p. 27). The second route occurs when the investigating agency has developed sufficient probable cause to identify a suspect, but unusual circumstances stymie efforts to take that suspect into actual physical custody. Examples of typical interferences would be when the suspect has died, when extradition from another jurisdiction is blocked, if the victim or a central witness elects not to cooperate, whenever a juvenile case receives non-judicial handling, or when the state attorney declines to pursue the matter (FDLE, 2008a, pp. 28-29).

Previous studies have recognized the utility of examining clearance activity. For one thing, case clearances provide a standardized inter-agency assessment tool (Borg & Parker, 2001, pp. 445-446; Jang, Hoover, & Lawton, 2008, p. 532; Paré, Felson, & Ouimet, 2007, p. 243). They also reflect police resource allocation, performance, and efficiency (Addington, 2006; Davies, 2007; Litwin, 2004, p. 331; Litwin & Xu, 2007, p. 94). Thus, clearance rates are an appealing comparative outcome measure.

Researchers who analyze police clearance practices are aware of two empirical regularities. First, U.S. homicide clearance rates have plummeted over the past 50 years, dropping from 94 percent in 1960 to the current level of 62 percent (Ousey & Lee, 2010; Regoeczi, Jarvis, & Riedel, 2008, pp. 142-143; Riedel & Boulahanis, 2007, pp. 151-152). The exact reasons behind this decline are still under investigation. Second, considerable variation in clearance rates exists from agency to agency, from offense to offense, and from case to case. These observations have spawned two distinct streams of inquiry. The first approach concentrates on unearthing case characteristics likely to produce an arrest or identify the actual perpetrator. The second path entails a comparative organizational analysis to determine why some agencies are more successful than others in solving cases. These studies routinely examine criminal lethality because of the wealth of information contained in homicide documentation.

Analyzing case characteristics has proven to be a fruitful venture, enabling researchers to gain insight into how homicide cases are solved (Addington, 2006; Alderden & Lavery, 2007; Lee, 2005; Litwin, 2004; Litwin & Xu, 2007; Puckett & Lundman, 2003; Regoeczi et al., 2008; Roberts & Lyons, 2009; Taylor, Holleran, & Topalli, 2009). However, three aspects preclude this vein of studies from being relevant to the current project. First, these articles dissect only

homicide incidents and the present study considers homicide plus six other index offenses. It may be that the findings to date are homicide-specific and do not pertain to other crimes.

Second, while the documentation surrounding homicide investigations is rich, other offenses do not receive similar attention. Third, the current study involves a multi-city comparison and routine record-keeping is far from systematic. Except for homicide, no secondary sources capture itemized case information from one locale to the next on a regular basis.

The second framework, organizational characteristics, is more pertinent to the present study. Wellford and Cronin (1999) analyzed 798 homicide cases and concluded that sound police investigative practices and ample resource allocation (e.g., crime scene preservation, immediately canvassing the scene for witnesses, detailed follow-up procedures to check leads, and deployment of detectives) were crucial determinants of whether a case would be solved. Other researchers have seized upon this orientation with varying degrees of success. Puckett and Lundman (2003), for example, found that while detective experience and workload were not related to case outcome, citizen cooperation was a key variable. A much more intensive analysis of agency practices in 55 jurisdictions pinpointed the importance of in-service training for detectives, greater reliance upon more scientific analysis of evidence, appropriate administrative case management, and public cooperation as important ingredients of homicide clearances (Keel, Jarvis, & Muirhead, 2009). Meanwhile, Roberts (2008) was unable to connect educational requirements for new officers, the ratio of investigators to violent crime, and involvement in community-policing initiatives with clearance rates for robbery, rape, or aggravated assault.

LINKING ACCREDITATION AND CLEARANCE RATES

The CALEA web site houses statements from police administrators that explain how accreditation has boosted agency performance or service delivery. While one might view these declarations as highly selective, self-serving, or merely testimonial in nature, these remarks do provide valuable glimpses into the occupational mind-set of police administrators who have ventured into the accreditation process. A number of these comments target clearance rates, arrests, and other crime control practices. For instance, the Kingsport (TN) police chief points to accreditation as being responsible for improving the Part I clearance rates in his jurisdiction from 10% in 1987 to 56% in 1998 (Keesling, 1999). In other instances, compliance with CALEA standards is credited with the solving of a “cold case” (Shearer, n.d.), the seizure of a dangerous police assassin without further incident (Johnson, n.d.), and clearances via the arrests of two suspects responsible for a string of armed robberies (Seebacher, n.d.).

The Florida accreditation manual devotes a chapter to how agency members, both patrol and plain-clothes, should conduct criminal investigations. While some of these standards address administrative aspects, others are more operationally oriented. The goal is to have “more efficient and effective criminal investigations” (CFA, 2008, Chapter 18). The standards include a wide array of topics and involve such things as setting up and maintaining case files, use of informants, crime scene preservation, evidence collection, interview and interrogation protocols, follow-up procedures, preparation and execution of search warrants, reliance upon polygraph and voice stress analyses, and surveillance practices. In short, this litany of “best practices,” when taken as a whole, is designed to help agencies conclude investigations successfully.

The message these expositions deliver is two-fold. First, implementation of accreditation standards places agencies in a more strategic position to solve cases expeditiously and enhances

their crime-control performance. Second, these achievements can be demonstrated through standard, objective accounting methods. Interestingly, the existing literature does not contain any independent, third-party multivariate empirical assessments that test these claims. As a result, the present study aims to remedy that gap by analyzing city clearance rates to determine whether accredited agencies out-perform their non-accredited counterparts in Florida.

THE PRESENT STUDY

THE STUDY GROUP

While the selection of Florida as the study site for the current project was largely fortuitous due to the researchers' ability to locate and assemble data from existing archives, the choice makes sense for at least three other reasons. First, the state is home to 2.2 percent of municipal police agencies, 4.9 percent of sworn city police officers, and 5.3 percent of full-time local police employees in the United States (Reaves, 2007, p. 10). Second, both the Florida Sheriffs' Association and the Florida Police Chiefs' Association played pivotal roles in establishing the body tasked with instituting a voluntary accreditation plan. This hands-on involvement was intended to overcome some of the reluctance that CALEA encountered, but could not navigate. While only 10 percent of Florida police organizations had won CALEA endorsement by the end of 2006 (Doerner & Doerner, 2009), 31 percent had gained CFA recognition. Finally, state-level accreditation was framed as a more feasible alternative for smaller and mid-sized agencies. In addition to containing four of the largest 50 municipal agencies in the nation, Florida also has a modest concentration of smaller departments. According to the 2007 *Criminal Justice Agencies Profile* (CJAP), 21 percent of all municipal agencies in the "Sunshine State" employed fewer than ten full-time sworn officers, 28 percent

fell into the 10–24 member range, and another 21 percent occupied the 25–49 grouping (FDLE, 2008b). Given these considerations, Florida poses an opportune venue for the present study.

Another consideration that has surfaced in the clearance literature is the necessity of examining data longitudinally. One way to sidestep the issues that accompany limited sample sizes and annual fluctuations is to average clearance rates over a multi-year period (Borg & Parker, 2001; Ousey & Lee, 2010) or pool cases over an extended number of years into a single file (Alderden & Lavery, 2007; Allison, Schuck, & Lersch, 2005; Jarvis & Regoeczi, 2009; Keel et al., 2009; Lee, 2005; Litwin, 2004; Ousey & Lee, 2010; Puckett & Lundman, 2003; Regoeczi et al., 2008; Riedel & Boulahanis, 2007; Roberts & Lyons, 2009). Another strategy is to partition the data into distinct time periods and analyze them separately (Litwin & Xu, 2007). While all these approaches have curative powers and can be appropriate alternatives, they underscore the need to be more sensitive to the issue of change over time. Given these considerations, the analytical technique taken in the present study is to conduct a panel data analysis to isolate what impact, if any, that accreditation exerts upon clearance rates.

Mathematically, the model can be written as

$$clear_{it} = \alpha_0 + \delta_1 accred_{it} + X_{it}\beta + u_{it}$$

where the subscript refers to police agency i in year t and the error term u is distributed $N(0, \sigma^2)$.

The study group is restricted to Florida municipal police departments that were in continuous operation throughout the 1997–2006 period and that also participated in both the CJAP and UCR programs. A handful of departments, containing the equivalent of mostly one or two full-time sworn officers, were chronic non-participants in the CJAP survey and were eliminated from inclusion in the sample. In addition, agencies that came into existence or were

disbanded during this time frame were not included in the analysis. Under ideal conditions, the final study group would have the potential to amass a total of 2,570 data points for each variable utilized in the analysis (257 agencies over a ten-year period). However, nine agencies either came into existence, were disbanded, or had missing data (discussed later) during this time frame. Thus, the panel is slightly unbalanced.

INDEPENDENT VARIABLES

Starting in 1996, FDLE launched a series titled *Criminal Justice Agency Profile*, an annual survey of all local, city, county, and state law enforcement organizations. This data collection effort is patterned after the national *Law Enforcement Management and Administrative Statistics* (LEMAS) project sponsored by the U.S. Department of Justice. Unlike LEMAS, CJAP contacts all agencies with fewer than 100 sworn members and is conducted on an annual, not periodic, basis. Information is gathered regarding minimum entrance requirements for incoming personnel, pre-service and in-service training requirements, employee salaries and benefits, various organizational aspects, and personnel characteristics. The current study relies upon this CJAP inventory to determine whether accreditation improves police resources sufficiently enough to exert a discernible effect on clearance rates.

The first group of variables extracted from CJAP was intended to tap patrol investigative readiness. Some studies have indicated that a prompt and thorough initial response can foster the resolution of homicide cases (Keel et al., 2009; Puckett & Lundman, 2003; Wellford & Cronin, 1999). Both CALEA and CFA maintain that accredited organizations house a more responsive, better-equipped, more educated, and diverse corps of officers. As a result, the items included in the present study are whether the agency had established a canine unit,⁴ the minimum education

level required for entry-level personnel, the minimum education level required for promotion to sergeant, how many weeks of preparation recruits receive during the post-academy Field Training Officer Program,⁵ and agency size in terms of the number of sworn personnel. The thinking is that a methodical and knowledgeable patrol response should result in more case closures.

The CJAP instrument asks agency administrators to indicate whether their department engages in any community-oriented policing (COP) practices. The basic premise behind the COP philosophy, an orientation that accreditation standards readily embrace (Cordner & Williams, 1995; Gingerich & Russell, 2006), is that the police cannot solve the crime problem unilaterally. Instead, law enforcement officials and the community must come together to form a joint partnership. Under this perspective, engaging in discourse on a routine basis, winning public trust, achieving mutual respect, and addressing quality-of-life issues are essential to effective crime control. While further probes into the quantity, quality, and types of COP would be more sensitive, the CJAP is restricted to just a single global question.

To control for fiscal capacity, law enforcement expenditure per capita was included. This variable divides the total annual police department budget by the number of inhabitants residing within the city limits. Previous studies of police organizations have invoked this cost-of-service indicator as a way to reflect the resources available for the police mission and the level of protection city residents receive (Briggs, Zhao, Wilson, & Ren, 2008; Wilson, Zhao, Ren, & Briggs, 2006; Zhao & Lovrich, 1997). These data were compiled by the Florida Legislative Committee on Intergovernmental Relations (2009), situated in the state Department of Financial Services, which routinely extracts budgetary figures from annual municipal reports.⁶

When studying clearance rates, some researchers have suggested it is necessary to control for the volume of known offenses as a way of adjusting for agency caseload (Borg & Parker, 2001; Cloninger & Sartorius, 1979; Davies, 2007; Keel et al., 2009; Litwin, 2004; Litwin & Xu, 2007; Paré et al., 2007; Xu, 2008). While results from these studies have not been uniform, the present study follows this lead and includes the violent and the property crime rates for control purposes.

The state legislature created the Commission for Florida Law Enforcement Accreditation to facilitate the professionalization of law enforcement organizations. Accreditation status reflects satisfaction of CFA requirements. The CFA maintains a directory of all currently accredited agencies on its website. Reliance upon multiple listings over time made it possible to identify agencies that won accreditation and those departments that remained in compliance with the periodic re-accreditation mandates required every three years afterwards.

Several variables recorded missing observations. Many of the CJAP instances were due to non-reporting in a particular year. Some of these oversights were easily reconciled because they represented a simple break in an ongoing series of consistent values. Substitutions were not allowed when values were absent in two consecutive years, when the errant data came at the start or end of an interval lacking an end-point or anchor value, or when a trend discontinued in the immediately following year. Missing expenditure data were handled by substituting the average of the preceding and succeeding years where possible.

DEPENDENT VARIABLE

The focus of the present study is upon annual agency clearance rates for violent index crimes (homicide, forcible rape, aggravated assault, and robbery) and for property index offenses

(burglary, larceny-theft, and motor vehicle theft). As discussed earlier, a clearance reflects a case that is resolved via arrest or in some other manner. Municipalities that failed to make a report to the UCR Program are eliminated from that year's analysis. No interpolations or other missing data substitutions are performed on either dependent variable.⁷

RESULTS

Table 2 contains the descriptive statistics for the nominal-level variables. The proportion of CFA-accredited agencies moves from 3% in 1997 to 31% by 2006. Involvement in community policing also displays an appreciable gain over the decade. Canine units also increase in popularity over the years. The trend is for more and more agencies to demand some college study for first-line supervisors. A one-way analysis of variables (values not shown in the table) reveals that entry-level education is the only indicator without a significantly changing distribution over the study period.

<Insert Table 2 about here>

Descriptive statistics for the interval-level variables appear in Table 3. Agency size remains relatively constant over the ten-year period and does not produce a significant one-way analysis of variance (values not shown in the table). Post-academy training shows a tendency to lengthen over the years. Law enforcement expenditures climb by 50% during the interval and crime rates exhibit a significant decline. Both violent and property clearance rates remain stable steady throughout the series and do not produce a significant one-way analysis of variance. However, 7% ($n = 181$) of the violent clearance rates and 5% ($n = 115$) of the property clearance rates have a zero value.

<Insert Table 3 about here>

The zero-order correlation matrix appears in Table 4. Because the cells are based upon large sample sizes, statistically significant relationships are not noted. Being accredited is linked with lower clearance rates. Similarly, all the police resources are weakly and negatively related to clearance rates. A scan of the matrix indicates multicollinearity is not problematic. The strong relationship between the violent and the property crime rates ($r = .73$) and clearance rates ($r = .42$) is of little concern because the two index crime categories are estimated independently later.

<Insert Table 4 about here>

Distributional graphs (not shown here) further confirm the limited and censored nature of the dependent variables. Normal OLS or pooling estimations would be misspecified. Table 5 presents the results of a random-effects tobit analysis. When accreditation status is the sole predictor in the model, it exerts a significant negative effect on violent clearance rates (-3.13) and a nonsignificant effect (0.14) on property clearance rates. The introduction of the remaining variables removes the significant effect of accreditation. The crime rate is positive and statistically important for both clearance rates. Higher rates exert pressure on police productivity, lead to greater reporting by the public, and result in more solved crimes. As agencies expand their size, clearance rates decrease. For example, a one standard deviation increase in the number of sworn personnel (nearly 120 people) is associated with a 4.9% percentage drop in violent cleared crimes and a 2.6% decrease in the average city's property clearance rate. Unfortunately, since size cannot be split into specific job positions, it is not possible to determine whether the impact reflects an enlarged bureaucracy or an inefficient ratio of personnel, like few detectives and an excess of field officers. Property clearance rates are also

significantly affected by police expenditure per capita. Spending \$322 more per person on law enforcement (a one standard deviation change) is associated with a 2.1% fall in property clearance rates. The result seems counterintuitive, but it is driven by a skewed distribution: 95% of agencies clear less than 50% of property crimes. Overall, the χ^2 values reveal that five of the six models have at least some predictive power.⁸ In sum, it does not appear that accreditation influences clearance rates when controlling for crime rates, agency size, fiscal capacity, investigative readiness, and police-community interactions.

<Insert Table 5 about here>

DISCUSSION

The results indicate that state-level accreditation does not bolster Florida municipal police clearance rates. In other words, accredited and non-accredited departments produce similar violent index and property index clearance rates once we hold constant other characteristics, despite claims to the contrary made by accrediting bodies. Given unique local circumstances, it is entirely possible that individual agencies, such as the example of the Kingsport (TN) Police Department cited earlier, may occasionally reap a profoundly different impact. However, such experiences are not the norm in Florida.

A possible alternative is that accreditation is more likely to be sought by agencies that can afford to pay for the credential. As a robustness check, random-effects panel estimations (not shown here) were performed while instrumenting accreditation with its own lag and also by the municipality's population size. The results mirror those listed in Table 5 and post-estimation tests indicate significant endogeneity. When we perform the same regressions with the lag of the dependent variable (justified in footnote 8), the endogeneity vanishes and the estimates remain

unchanged. Thus, two conclusions emerge. First, the proxy and instrumental approaches are relatively interchangeable. We prefer the proxy approaches in Table 5 because of the functional form of the dependent variable. Second, accreditation seems to be endogenously driven by community size and, when that is controlled, accreditation has no contemporaneous or lagged effect on clearance rates.⁹ This finding can be explained as follows: as municipal population increases, agencies have greater manpower and budgets that lead to a higher likelihood of self-selecting into the accreditation process. If the sworn size variable could be replaced in future work with specific officer types (e.g., patrol, investigations, support, and technical services) or budgetary streams for specific law enforcement activities, then those endogenous results might be even more compelling.

The current study also holds some implications for the clearance literature. Generally speaking, researchers who examine variation in homicide clearance patterns focus either on case characteristics or agency resources. While Wellford and Cronin (1999) have advanced the notion that revamped police practices and more appropriate resource allocation are responsible for more efficient and productive investigations, other studies have not found similar empirical support (Ousey & Lee, 2010; Puckett & Lundman, 2003; Roberts, 2008). One problem with the current study is that the measures might be too global and not sensitive enough to provide a critical evaluation. For example, the community orientated policing indicator used here does not reflect how widespread or deeply embedded this philosophy has become in an agency.

Although the current results may disappoint proponents, it would be premature to dismiss accreditation outright as ineffective. Because the existing literature is rather sparse and rudimentary, it might be productive to sketch out a research agenda that would enable a more

empirically grounded view. As Table 1 demonstrated, accreditation is poised to impact three distinct audiences: administrators, agency employees, taxpayers, and other criminal justice system entities. While some researchers have probed executive reactions to accreditation (Carter & Sapp, 1994; DuPont, 1993), these early efforts represent an initial step in the effort to gain a full and more complete understanding of this activity. The motivations, expectations, and experiences that inform police chiefs' decisions to seek or refrain from engaging in this effort remain unearthed. Furthermore, nothing is known about how city managers, mayors, or city commission/council members influence the decision that an agency should undergo or forego such external review. A second layer of interest are the implications that accreditation has for agency personnel. Only one study compares officer attitudes in accredited agencies against their non-recognized counterparts (Gingerich & Russell, 2006). Furthermore, there are no studies that focus on non-sworn employees, let alone the public. How accreditation affects the intended audiences remains an open question at this time.

While the present study concentrates exclusively on clearance rates, accreditation supposedly carries a multitude of ramifications. Some examples would be claims of more affordable insurance premiums, reduced exposure to civil liability, fewer out-of-court settlements, a reduction in adverse civil judgments, fewer disgruntled and more empowered employees, a smaller number of grievances, more equitable disciplinary actions, and other improvements. To date, all these aspects have gone unstudied. Legal and financial protections are compelling reasons to consider accreditation and they have probably helped inspire the industry's growth.

Independent audits show that accreditation has grown into a sizeable enterprise. CALEA

assets totaled nearly \$6 million at the end of 2008 (CALEA, 2009b, p. 36). Collections (accreditation fees, agency charges, and conference registrations) had doubled in comparison to 1999 figures, surpassing the \$4.5 million mark (CALEA, 2000, p. 12; CALEA, 2009b, p. 37). Similarly, employee expenditures (salaries, fringe benefits, payroll taxes, and retirement contributions) rose from slightly less than \$1 million in 1999 to just under \$2 million in 2008 (CALEA, 2000, pp. 13, 18; CALEA, 2009b, pp. 37, 42). While financial information is not readily available for state groups, there is nothing to suggest they are not similarly profitable.

Given these sizable rents, an intriguing question is how has the accreditation movement managed to prosper without attracting a corresponding body of research to scrutinize the benefits it claims to produce? Four marketing strategies may have bolstered the accreditation process, expanded its reach, and stifled negative publicity. First, CALEA and some state accreditation bodies have diversified their product lines by offering additional programs tailored to public safety communications centers and training academies. Second, along with targeting federal, state, and special jurisdiction agencies, CALEA is spreading into new international markets in Canada, Latin America, and Mexico. The third approach is to make the accreditation process less daunting. CALEA sponsors “Police Accreditation Coalitions” (PACs), state networks composed of representatives from already accredited law enforcement agencies (CALEA, 2010). These support groups maintain web sites, offer training, lend advice to entities navigating the accreditation process, hold conferences, and help members become assessors. Finally, CALEA has instituted a scaled-down, intermediate version of accreditation in the hope of spurring agencies to pursue full accreditation status.

Not to be left out of the picture are the consultants who offer their services to agencies

coveting state or national recognition. Online company descriptions commonly stress their employees' experiences as former high-ranking officers, departmental accreditation managers, or past assessors. It has been suggested elsewhere that ambitious police executives might even utilize accreditation status to enhance their personal credentials as they transition within law enforcement and political circles (Doerner & Doerner, 2009). All in all, the accreditation movement has become a lucrative endeavor that, until recently, has avoided major inspection.

A final consideration is that the accreditation industry remains virtually autonomous. There is very little governmental oversight. Ironically, the very same state legislatures that felt a compulsion to adopt minimum standards for entry-level personnel during the 1960s still have not enacted a corresponding set of minimum expectations for today's law enforcement agencies. Perhaps accreditation does not actually achieve enough marginal gains to merit political support. On the other hand, agencies might already follow other industry practices, such as those prescribed by the IACP. Either way, legislative bodies have remained oddly silent about the private guidelines being placed on public safety institutions. To be fair, though, academicians have been no more vocal.

CONCLUSION

In light of everything else discussed in this paper, the management of private accreditation as a default mechanism for meaningful reform in the public law enforcement sector deserves more intensive and critical scrutiny than what has been offered thus far. A recent work finds that accreditation does not facilitate significant organizational improvements (Doerner & Doerner, 2009). This current study extends that effort by showing a lack of any short-term or long-run impact on clearance rates. Future work should continue to establish whether there are

real legal, structural, or productivity benefits to the voluntary self-improvement efforts. For now, accreditation at least appears successful at targeting the public coffer.

ENDNOTES

1. A total of 487 municipal police departments are listed in the CALEA database as of August 2010. Accreditation has already been bestowed upon 385 agencies and 102 others are actively undergoing a self-assessment. All of those agencies have paid a lump-sum fee to begin the process. The CALEA web site lists those initial charges by agency size. Based on their figures, over \$5.6 million have been collected. In addition to the first payment, accredited agencies must remain current with annual fees. Those revenues account for \$2 million. Once the other agencies complete their self-assessment, they will contribute an additional \$1.6 million per year.
2. According to a list on the CALEA web site, at least thirty police accreditation coalitions have been created to assist police agencies seeking accreditation.
3. The International Association of Chiefs of Police (IACP) established the National Law Enforcement Policy Center in 1987 and tasked it with developing model policies and making them available to the law enforcement community. To date, the Center has produced 117 model guidelines. Interested administrators can pick and choose which, if any, IACP guidelines they wish to consider. While one might have the impression that the IACP approach and the accreditation procedures are redundant, they do embark on two very different directions. For one thing, while the exact number of applicable accreditation standards depends upon agency size and the functions it discharges, there are 463 CALEA standards and 275 Florida standards. A second consideration is the material content. The

IACP model policies are very detailed and contain explicit courses of action. CFA standards, on the other hand, generally refrain from referencing specific behaviors in the field. Instead, they concentrate more heavily on the mechanical aspects of having a policy in place, ensuring that each agency member receives a copy, documenting that training has occurred, and so forth. Take, for example, the topic of domestic violence. The IACP starts with dispatch procedures, recommends the deployment of at least two officers, warns against the use of emergency lights and sirens when responding, advises officers where to park upon arrival, advises officers to separate the feuding parties, and so forth. In contrast, the CFA protocol looks to ensure that the agency policy addresses initial response to the scene, on-scene investigations, arrest procedures, and so forth. The exact contents may vary from one agency to the next.

4. The absence of an established canine unit in an agency does not always mean that the agency lacks access to such a resource. Many agencies maintain mutual aid agreements with the county sheriff to provide services.
5. It appears that this item generated some confusion for some respondents. A handful of agencies indicated they had an FTO Program that extended for 52 weeks. In Florida, though, a new police employee is considered to be an at-will employee for the first year. In other words, the employer can dismiss the employee at any point during this period and is not obligated to provide a reason for the termination.
6. An examination of the univariate distribution for this variable uncovered an extreme outlier throughout the entire series. In 2006, Indian Creek Village spent \$31,446 per capita for law enforcement services. Indian Creek Village is a small island located in the Miami area. It

contains 14 houses occupied by 38 residents, has one of the highest incomes of any area in the United States, and is home to a variety of celebrities. Ten full-time officers, 4 part-time officers, and 4 civilians staff the Indian Creek Village Police Department.

7. It is possible, especially in smaller jurisdictions, for a clearance rate to exceed 100 percent. Borg and Parker (2001, p. 447) attempted to deal with this situation by utilizing a three-year-moving average to smooth out yearly fluctuations. This strategy was not amenable to the present study because reliance upon a multi-year measure would risk mixing years prior to and after accreditation in the same calculation. Davies (2007, fn. 5) retained values that exceeded 100 percent, while Jang et al. (2008, fn. 2) eliminated these cases from the analysis. Of the 2,530 violent clearance rates contained in the present study, 35 agencies exceeded a value of 100 percent, although 240 were equal to 100 for at least one year. For property clearance rates, only 2 jurisdictions reported property clearance rates greater than 100 percent while 26 were equal to 100 for at least one year. All these observations were kept in the analysis.
8. A referee raised the concern that the random-effects model and its covariates do not control for unobserved time-constant heterogeneity. This is a valid concern. The estimated results could be biased because omitted characteristics of police departments and their surrounding communities are lumped into the error term. From a practical standpoint, it would be difficult to capture every pertinent variable for nearly 260 agencies across 10 years. Fixed-effects estimation is an option, but the cost is a considerable adjustment to the degrees of freedom (from $NT-K$ to $NT-N-K$) and the introduction of positive serial correlation. To avoid both of those downfalls, another alternative is to lag the dependent variable and use it as a

proxy for the unobserved variation (Wooldridge, 2009, pp. 310-312). This approach allows the original variables to capture only contemporaneous effects, like the impact of being accredited on clearances in that same year. Another benefit is that the degrees of freedom are relatively preserved (only losing 1 instead of N). With this model, the estimations are almost exactly the same as before; only the crime rates become insignificant. Since the interpretations remain unchanged after controlling for agency and community heterogeneity, unobserved heterogeneity does not appear to bias the earlier results.

9. Another referee comment suggested that accreditation might be an executive decision which takes time to improve the organizational structure of a police department and achieve productivity gains. To explore that hypothesis, models with one to four lags of the accreditation variable are tested for immediate short-run effects as well as a long-run propensity that could amass over time. Neither impact is significant in any lagged model. To some extent, this is not surprising. Agencies begin adopting accreditation policies during the “self-assessment” phase, which can last up to 36 months. By the time the professional credential is awarded, structural changes are internalized and should be noticeable.

TABLE 1
Accreditation Benefits Advertised by National and State Law Enforcement Accreditation Bodies

Benefit	CALEA	AK	FL	GA	IL	IN	MS	NJ	NY	OK	PA	SC	VA	WA
Increases accountability due to written standards/goals, management, training	X	X	X	X	X	X	X	X	X	X	X	X	X	X
State-of-the-art standards, updated info	X		X	X	X		X	X	X	X	X	X	X	
Effective and efficient service delivery; improves performance and evaluation	X	X	X	X	X	X	X	X	X	X	X		X	X
Corrects internal deficiencies		X	X				X	X		X			X	
Prevents and controls crime	X		X		X	X	X	X		X			X	
Reduces insurance premiums	X						X	X			X	X		X
Defends against civil liability lawsuits	X	X		X			X	X	X		X	X		X
Improves public trust, confidence, support, understanding	X		X	X	X	X	X	X		X	X	X	X	X
Promotes community policing, quality of life	X		X		X	X	X	X			X		X	
Increases cooperation with other criminal justice system members			X			X	X	X		X			X	
Improves employee morale			X				X	X	X	X	X	X	X	X

Source: Author compilation.

TABLE 2
Descriptive Statistics, Nominal-Level Variables

Variable	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Accredited: 1 = Yes <i>n</i>	3% 256	5% 257	9% 255	14% 255	15% 255	20% 255	23% 255	26% 255	30% 255	31% 256
COP: 1 = Yes <i>n</i>	80% 251	78% 253	71% 254	77% 251	61% 251	57% 253	49% 251	50% 252	53% 251	51% 254
Canine Unit: 1 = Yes <i>n</i>	43% 256	45% 257	44% 255	53% 255	50% 255	48% 255	54% 254	55% 253	56% 253	57% 255
Entry Education: 1 = Some College <i>n</i>	8% 256	11% 257	12% 255	12% 255	11% 255	10% 253	13% 254	13% 255	10% 255	10% 256
Promote Education: 1 = Some College <i>n</i>	14% 256	14% 257	15% 255	31% 255	28% 255	29% 252	33% 251	32% 250	31% 252	31% 254

LE Expenditure per capita:										
<i>Mean</i>	249.46	260.33	277.30	284.70	294.50	306.06	317.44	338.17	352.54	378.07
<i>S.D.</i>	259.38	281.03	305.01	290.23	303.92	311.27	315.25	340.10	354.23	406.28
<i>n</i>	252	255	253	254	253	254	254	253	251	253
FTO Weeks:										
<i>Mean</i>	9.82	9.80	10.58	10.97	11.60	11.81	12.10	12.02	10.80	12.16
<i>S.D.</i>	5.31	5.20	4.94	4.74	4.15	5.04	4.45	4.46	5.54	4.30
<i>n</i>	245	252	255	254	252	251	253	252	252	252

TABLE 4
Zero-Order Correlation Matrix

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	Y ₁	Y ₂
X ₁ Accredited	1.00	-0.04	-0.02	0.24	0.02	0.18	0.26	0.20	0.17	0.21	-0.09	-0.06
X ₂ Violent Crime Rate		1.00	0.73	0.23	0.00	0.08	0.22	0.10	0.00	0.00	-0.07	0.03
X ₃ Property Crime Rate			1.00	0.17	0.20	0.13	0.18	0.08	0.04	0.01	-0.09	-0.03
X ₄ # Sworn				1.00	0.00	0.26	0.37	0.27	0.29	0.21	-0.16	-0.14
X ₅ LE Expenditure					1.00	-0.06	-0.12	-0.06	0.11	0.09	-0.14	-0.15
X ₆ COP						1.00	0.28	0.20	0.13	0.08	-0.08	-0.10
X ₇ Canine Unit							1.00	0.33	0.16	0.19	-0.10	-0.01
X ₈ FTO Weeks								1.00	0.14	0.19	-0.10	-0.12
X ₉ Entry Education									1.00	0.42	-0.07	-0.08
X ₁₀ Promote Education										1.00	-0.02	-0.02
Y ₁ % Violent Cleared											1.00	0.42
Y ₂ % Property Cleared												1.00

Note: Because of the large sample size, a correlation of .04 is significant at the .05 level.

Log-Likelihood	-10,380	-10,272	-9,999	-9,72	-9,701	-9,419
χ^2	4.64*	31.60*	31.64*	0.04	20.24*	23.78*

Note: The lower and upper censoring thresholds are 0 and 100, respectively. The log-likelihood function is maximized using a Gauss-Hermite quadrature with twelve integration points (see Olsen and Shafer, 2001). Standard errors are bootstrapped by 50 random draws from the sample. The * indicates significance at the .05 level.

REFERENCES

- Addington, L.A. (2006), "Using national incident-based reporting system murder data to evaluate clearance predictors: a research note", *Homicide Studies*, Vol. 10 No. 2, pp. 140-52.
- Alderden, M.A. and Lavery, T.A. (2007), "Predicting homicide clearances in Chicago: investigating disparities in predictors across different types of homicide", *Homicide Studies*, Vol. 11 No. 2, pp. 115-32.
- Allison, S.F.H., Schuck, A.M. and Lersch, K.M. (2005), "Exploring the crime of identity theft: prevalence, clearance rates, and victim/offender characteristics", *Journal of Criminal Justice*, Vol. 33 No. 1, pp. 19-29.
- Borg, M.J. and Parker, K.F. (2001), "Mobilizing law in urban areas: the social structure of homicide clearance rates", *Law & Society Review*, Vol. 35 No. 2, pp. 435-66.
- Briggs, S. J., Zhao, J., Wilson, S. and Ren, L. (2008), "The effect of collective bargaining on large police agency supplemental compensation polices: 1990-2000", *Police Practice and Research*, Vol. No. 3, pp. 227-38.
- Burlingame, D. and Baro, A.L. (2005), "Women's representation and status in law enforcement: does CALEA involvement make a difference?", *Criminal Justice Policy Review*, Vol. 16 No. 4, pp. 391-411.
- Carter, D.L. and Sapp, A.D. (1994), "Issues and perspectives of law enforcement accreditation: a national study of police chiefs", *Journal of Criminal Justice*, Vol. 22 No. 3, pp. 195-204.
- Cloninger, D.O. and Sartorius, L.C. (1979), "Crime rates, clearance rates and enforcement effort: the case of Houston, Texas", *American Journal of Economics and Sociology*, Vol. 38 No. 4, pp. 389-402.
- Commission for Florida Law Enforcement Accreditation, Inc. (2008), *Standards Manual Edition 4.0*, Commission for Florida Law Enforcement Accreditation, Inc., Orlando, available at: www.flaccreditation.org/standards.htm, (accessed June 16, 2010).
- Commission on Accreditation for Law Enforcement Agencies, Inc.(2000), *Annual Report 1999*, CALEA, Fairfax, VA, available at: www.calea.org/Online/AnnualReports/1999AnnualRpt.pdf (accessed June 15, 2010).
- Commission on Accreditation for Law Enforcement Agencies (2009a), "Fall 2009 conference", Commission on Accreditation for Law Enforcement Agencies, Fairfax, VA, available at: www.calea.org/Online/NewsRelease/newsrelease11042009.htm (accessed June 16, 2010).

Commission on Accreditation for Law Enforcement Agencies, Inc. (2009b), *Annual Report 2008*, CALEA, Fairfax, VA, available at: www.calea.org/Online/AnnualReports/AnnualRepprt2008.pdf (accessed June 15, 2010).

Commission on Accreditation for Law Enforcement Agencies, Inc. (2010), "Police accreditation coalitions (PACs)", CALEA, Fairfax, VA, available at: www.calea.org/Online/Clients/PACList.htm (accessed June 15, 2010).

Cordner, G.W. and Williams, G.L. (1995), "Community policing and accreditation: a content analysis of CALEA standards", *Police Forum*, Vol. 5 No. 1, pp. 1-10.

Cotter, J.V. (1983), "Law enforcement accreditation: a big step toward professionalism", *FBI Law Enforcement Bulletin*, Vol. 52 No. 9, pp. 19-23.

Davies, H. J. (2007), "Understanding variations in murder clearance rates: the influence of the political environment", *Homicide Studies*, Vol. 11 No. 2, pp. 133-50.

Doerner, W.G. and Doerner, W.M. (2009), "The diffusion of accreditation among Florida police agencies", *Policing: An International Journal of Police Strategies & Management*, Vol. 32 No. 4, pp. 781-98.

DuPont, J.F. (1993), "Law enforcement accreditation: the desirable future or just another passing phase?", available at: www.fdle.state.fl.us/Content/getdoc/728ffe3d-02fb-4761-aa7c-25805a62645d/DuPont.aspx (accessed June 16, 2010).

Florida Department of Law Enforcement (2008a), *Uniform Crime Reports Guide Manual*, Tallahassee, Florida Department of Law Enforcement.

Florida Department of Law Enforcement (2008b), *2007 Criminal Justice Agency Profile Report*, Tallahassee, Florida Department of Law Enforcement.

Florida Legislative Committee on Intergovernmental Relations (2009), *Expenditures and Revenues Reported by Florida's Local Governments*, Florida Department of Financial Services, available at: www.floridalcir.gov/fiscal.cfm (accessed June 16, 2010).

Gingerich, T.E. and Russell, G.D. (2006). "Accreditation and community policing: are they neutral, hostile, or synergistic? An empirical test among street cops and management cops." *Justice Policy Journal* 3:1-28.

Houglund, S.M. and Mesloh, C. (2005), "Reliability of risk management data in measuring police performance: an initial empirical analysis", *Law Enforcement Executive Forum*, Vol. 5 No. 1, pp. 45-51.

Jang, H., Hoover, L.T. and Lawton, B.A. (2008), "Effect of broken windows enforcement on clearance rates", *Journal of Criminal Justice*, Vol. 36 No. 6, pp. 529-38.

Jarvis, J.P. and Regoeczi, W.C. (2009), "Homicides clearances: an analysis of arrest versus exceptional outcomes", *Homicide Studies*, Vol. 13 No. 2, pp. 174-88.

Johnson, L.M. (n.d.), "Case number 62: incident command system protocols used in locating suspect", Commission on Accreditation for Law Enforcement Agencies, Fairfax, VA, available at: www.calea.org/Online/newsletter/No93/aw62.htm (accessed June 15, 2010).

Keel, T.G., Jarvis, J.P. and Muirhead, Y.E. (2009), "An exploratory analysis of factors affecting homicide investigations: examining the dynamics of murder clearance rates", *Homicide Studies*, Vol. 13 No. 1, pp. 50-68.

Keesling, J.J. (1999), "Case #17: roadmap to technology improvement", Commission on Accreditation for Law Enforcement Agencies, Fairfax, VA, available at: www.calea.org/Online/Accreditationworks/case17.htm (accessed June 16, 2010).

Kurz, D.L. and Kelly, S.F. (2005), "Accreditation and the smaller police agency", *Law Enforcement Executive Forum*, Vol. 5 No. 1, pp. 33-38.

Lee, C. (2005), "The value of life in death: multiple regression and event history analyses of homicide clearance in Los Angeles County", *Journal of Criminal Justice*, Vol. 33 No. 6, pp. 527-34.

Litwin, K.J. (2004), "A multilevel multivariate analysis of factors affecting homicide clearances", *Journal of Research in Crime and Delinquency*, Vol. 41 No. 4, pp. 327-51.

Litwin, K.J. and Xu, Y. (2007), "The dynamic nature of homicide clearances: a multilevel model comparison of three time periods", *Homicide Studies*, Vol. 11 No. 2, pp. 94-114.

Mastrofski, S.D. (1986), "Police agency accreditation: the prospects of reform", *American Journal of Police*, Vol. 5 No. 2, pp. 45-81.

McCabe, K.A. and Fajardo, R.G. (2001), "Law enforcement accreditation: a national comparison of accredited vs. nonaccredited agencies", *Journal of Criminal Justice*, Vol. 29 No. 2, pp. 127-31.

Olsen, M.K. and Schafer, J.L. (2001), "A two-part random-effects model for semicontinuous longitudinal data", *Journal of the American Statistical Association*, Vol. 96 No. 254, pp.730-745.

Ousey, G.C. and Lee, M.R. (2010), "To know the unknown: the decline in homicide clearance

rates, 1980–2000", *Criminal Justice Review*, Vol. 35 No. 2, pp. 141-58.

Paré, P., Felson, R.B. and Ouimet, M. (2007), "Community variation in crime clearance: a multilevel analysis with comments on assessing police performance", *Journal of Quantitative Criminology*, Vol. 23 No. 3, pp. 243-58.

Puckett, J.L. and Lundman, R.J. (2003), "Factors affecting homicide clearances: multivariate analysis of a more complete conceptual framework", *Journal of Research in Crime and Delinquency*, Vol. 40 No. 2, pp. 171-93.

Reaves, B.A. (2007), *Census of State and Local Law Enforcement Agencies, 2004*, US Department of Justice, Washington, DC, available at: www.ojp.usdoj.gov/bjs/pub/pdf/csllea04.pdf (accessed March 2, 2009).

Regoeczi, W.C., Jarvis, J. and Riedel, M. (2008), "Clearing murders: is it about time?", *Journal of Research in Crime and Delinquency*, Vol. 45 No. 2, pp. 142-62.

Riedel, M. and Boulahanis, J.G. (2007), "Homicides exceptionally cleared and cleared by arrest: an exploratory study of police/prosecutor outcomes", *Homicide Studies*, Vol. 11 No. 2, pp. 151-64.

Roberts, A. (2008), "The influences of incident and contextual characteristics on crime clearance of nonlethal violence: a multilevel event history analysis", *Journal of Criminal Justice*, Vol. 36 No. 1, pp. 61-71.

Roberts, A. and Lyons, C.J. (2009), "Victim-offender racial dyads and clearance of lethal and nonlethal assault", *Homicide Studies*, Vol. 46 No. 3, pp. 301-26.

Seebacher, M. (n.d.), "Case number 50: the value of crime analysis", Commission on Accreditation for Law Enforcement Agencies, Fairfax, VA, available at: www.calea.org/Online/newsletter/No87/aw50.htm (accessed on June 16, 2010).

Shearer, J. (n.d.), "Accreditation works: case number 74: compliance with 'cold case' standards results in arrest", Commission on Accreditation for Law Enforcement Agencies, Fairfax, VA, available at: www.calea.org/Online/newsletter/No100/aw74.htm (accessed June 16, 2010).

Southerland, M.D., Merlo, A.V., Robinson, L, Benekos, P.J. and Albanese, J.S. (2007), "Ensuring quality in criminal justice education: academic standards and the re-emergence of accreditation", *Journal of Criminal Justice Education*, Vol. 18 No. 1, pp. 87-105.

Taylor, T.J., Holleran, D. and Topalli, V. (2009), "Racial bias in case processing: does victim race affect police clearance of violent crime incidents?", *Justice Quarterly*, Vol. 26 No. 3, pp. 562-91.

Thrasher, P.A. (1979), "Accreditation: a perspective", *The Journal of Higher Education*, Vol. 50 No. 2, pp. 115-20.

Wellford, C. and Cronin, J. (1999), *An Analysis of Variables Affecting the Clearance of Homicides: A Multistate Study*, Washington, D.C., Justice Research and Statistics Association.

Xu, Y. (2008), "Characteristics of homicide events and the decline in homicide clearance: a longitudinal approach to the dynamic relationship, Chicago 1966–1995", *Criminal Justice Review*, Vol. 33 No. 4, pp. 453-79.

Wilson, S., Zhao, J., Ren, L. and Briggs, S. (2006), "The influence of collective bargaining on large police agency salaries: 1990–2000", *American Journal of Criminal Justice*, Vol. 31 No. 1, pp. 19–34.

Wooldridge, J. M. (2009), *Introductory Econometrics: A Modern Approach*, South-Western Cengage Learning, Mason, OH.

Zhao, J. and Lovrich, N. (1997), "Collective bargaining and the police: the consequences for supplemental compensation policies in large agencies", *Policing: An International Journal of Police Strategies & Management*, Vol. 20 No. 3, pp. 508–18.