

Issues and Patterns in the Comparative International Study of Police Strength*

EDWARD R. MAGUIRE and REBECCA SCHULTE-MURRAY

ABSTRACT

Published studies have examined patterns of police strength in only a handful of industrialized, and mostly English-speaking, democracies. There are primarily two reasons for this. First, practical limitations, especially language, make it difficult to collect international data on police strength. Second, even when such data are available, they are often riddled with errors related to erratic reporting and other reliability and validity problems. Perhaps the most important source of these problems is simply confusion among researchers and/or survey respondents about the meaning of the term "police." We begin by reviewing existing research and theory on police strength. Using a new data set compiled from multiple sources, we then explore differences in police strength, both between nations (cross-sectionally) and over time (longitudinally). After summarizing what is and what remains to be known about police strength from a comparative perspective, we close with an explicit agenda for future theory, research and data collection on this topic.

Introduction

POLICE STRENGTH is a term used to describe the number of police officers and/or police employees in a particular organization or jurisdiction. A great deal of domestic research has explored the causes and consequences of police strength within nations, most often in English-speaking, western democracies such as the United States, the United Kingdom, and Canada. Very little research has explored police strength from a comparative international perspective. One exception is the work of David Bayley (1975, 1985, 1992), which we will draw upon heavily

* Direct correspondence to Professor Edward R. Maguire, George Mason University, 10900 University Boulevard, MS4F4, Manassas, Virginia, 20110-2203, USA. Portions of the research discussed in this paper were completed under contract with the Urban Institute and supported with funding from the U.S. National Institute of Justice (grant number 1999-IJ-CX-0011). The views expressed in this paper are those of the authors and do not necessarily reflect the positions of either the Urban Institute or the National Institute of Justice.

throughout this article. Little is known about why some nations are more heavily policed than others and how police strength varies over time within nations. Furthermore, unlike research and intelligence on military capacity, no effort has been made to measure and track the size of the world's policing establishment.

This article explores cross-sectional and longitudinal differences in police strength between nations over the past decade. It represents the first product from a broader research agenda with three ambitious goals. First, after collecting data from a large number of nations, we hope to explore the factors that account for differences in police strength between nations. Second, after compiling a longitudinal data series on police strength over the past decade, we hope to explore why some nations are experiencing a period of growth (increasing police strength), others a period of decline, and others a period of stability. Finally, we hope to draw some inferences about whether the global policing industry has experienced a period of growth or decline relative to the world population over the past decade. Ideally, the data could be used as a springboard for understanding how the police, an important social control institution in every nation state, are becoming more or less prevalent in the lives of citizens throughout the world. Furthermore, these data could be used to test theories and make forecasts about future changes in the size of the international policing establishment. For reasons that will become clear shortly, this article represents only a small and tentative step toward answering these questions. Much remains to be done.

This article begins by reviewing what is known about police strength, its definition, the theories used to explain it, and the methods used to study it. We then describe the current state of international data on police strength. In a nutshell, significant data problems make it difficult at this point to draw much more than weak inferences about differences in police strength over time and place. After discussing these data problems, we describe how we developed the International Police Strength (IPS) file from numerous sources. Using the IPS data, we then describe national differences in police strength relative to the size of the population. Furthermore, we generate some tentative conclusions about the growth of the world's policing establishment. We conclude with a number of recommendations for future research and theory on this topic.

Research on Police Strength

Over the past 30 years, there have been more than fifty empirical studies on the "causes" of police strength (Maguire 1999). These studies have used a variety of theories, data sources, and statistical methods to explain variation in police strength over time and across jurisdictions. Some of the studies are methodical, careful and precise, but many use faulty methods and flawed data. While there has been some progress made in the statistical methods used, overall there has not been much

effort devoted to the incremental development of a scientific body of knowledge in this area. Researchers routinely ignore the cautions and findings of previous research. As a result, it is difficult to synthesize the results of this large body of research into a succinct summary of the causes and correlates of police strength.

What is Police Strength?

Police strength, while often peripherally defined (as above), is an imprecise term. Researchers have operationalized it in a number of ways, the three most common being the number of sworn police officers, the number of police employees, and the amount of police expenditures.¹ A handful of researchers have also discussed the difference between absolute and relative police strength (Chamlin and Langworthy 1996; Slovak 1986). Absolute strength is the raw number of police officers or employees in a jurisdiction, while relative strength expresses these variables as a ratio (usually per capita or per unit area). Thus, if we multiply the three potential measures of police strength by the two ways they can be expressed — as a ratio or a raw number — there are roughly six dependent variables used in this line of research. In addition, researchers have pointed out that explaining variations in police strength across jurisdictions is very different than explaining *changes* in police strength (growth and decline) within a jurisdiction (or sample of jurisdictions) over time. Several researchers have recently suggested that one reason for disparate research findings is that these three choices about how to measure police strength — to use employees, officers or expenditures, to use rates or raw numbers, and to use differences or levels — matter greatly (Chamlin and Langworthy 1996; Marvell and Moody 1996; Nalla, Lynch, and Leiber 1997; Slovak 1986; Snipes 1993).

Domestic research on police strength tends to regard the definition of "police" as assumed or self-evident. Yet, critics have pointed out that even within a single locality or nation, understanding exactly what constitutes a police officer can be difficult. For instance, estimates of police strength in the United States frequently exclude military police and federal law enforcement authorities such as the Federal Bureau of Investigation or the Drug Enforcement Administration. On the other hand, they often include sheriffs' deputies whose primary roles are to serve as guards in correctional institutions or courthouses (Maguire et al. 1998). The decision to include or exclude certain types of police usually has more to do with the way police strength data are recorded than with intellectual decisions about the definition of a police officer.

Yet, when shifting units of analysis from places and times within a single nation to nations as a whole, the need to define the term "police" becomes paramount. Bayley (1985) use the term police to:

refer to people authorized by a group to regulate interpersonal relations within the group through the application of physical force. This definition has three essential parts: physical force, internal usage and collective authorization. (P. 7)

While other groups or agencies may oversee or direct the use of force, police alone are actually authorized to apply it. Similarly, other groups may serve a regulatory or enforcement function that appears similar to policing, but may not be authorized to administer physical force in carrying out enforcement functions. Internal usage refers to the threshold typically used to separate the police from the military. In most nations, police are responsible for internal security and the military for external security. In practice, this line is sometimes blurry (Newton 1998; U.S. Department of State 1999). Collective authorization refers to the source of police power: the state. This element is useful for separating out enforcement activities that are authorized by the state (e.g., police-related) and those that are not (e.g., vigilantes, terrorists). However, entities other than states can provide collective authorization. Among the examples Bayley provides are armies, universities, mining companies, and tribes. Even this fairly explicit definition leaves room for interpretation about what constitutes a police officer or police employee.

Theories

One area in which this body of research is more developed than other lines of research on police organizations is the use of theory (Eck and Maguire forthcoming). Studies of police strength are typically based (at least implicitly) on one or more of the following three theoretical foundations: (1) rational public choice (or consensus) theory, (2) conflict theory, and/or (3) some form of organizational theory (Nalla, Lynch, and Leiber 1997).

Rational public choice (also known as consensus or economic) theory implies that police strength increases in response to citizens' consensual requests for increased public service and protection, often in the face of rising crime rates. This theory implies that governments and police administrators dole out resources systematically. For decades, communities have relied on various methods for determining the appropriate amount of police resources for given areas and times. These methods range from informal rules of thumb, such as the need to have at least two officers per thousand residents, to more complex mathematical models implemented in computer software packages (Bayley 1994; Chaiken 1975; Larson 1978; O'Boyle 1990; Stenzel 1993). The kinds of variables that have typically been included in these formal and informal systems are the usual suspects: crime rates, population, calls-for-service, and other correlates of police workload. These various methods reflect an implicit theory of administrative rationality, suggesting that police strength is a function of a few simple workload variables. Research

evidence on the strength of this theory is thoroughly mixed. Most rigorous tests of this theory have concluded that alone it is incapable of explaining variations in police strength (Chamlin and Langworthy 1996). As Loftin and McDowall (1982) conclude, rational choice or economic models are "too simple to account for the relationship between crime and police strength" (p. 400). They suggest that models of police strength need to account for other factors in the social and political environment of police organizations.

If police strength is not based on a rational adjustment to variations in crime rates, then what other factors are important? Conflict theory posits that racial and economic inequality leads the powerful members (elites) in a community to exert political influence over social control institutions. Such conflict processes would lead to increases in social control over the powerless. Tests of conflict theory have concentrated on racial and/or economic sources of conflict. These tests are usually done by examining whether variations or changes in the size of "threatening" populations produce differences in police force strength. Research on social threat or conflict theory is also overwhelmingly mixed, although there is evidence to support both racial conflict (e.g., Jackson and Carroll 1981; Liska, Lawrence, and Benson 1981; Snipes 1993) and economic or class conflict explanations (e.g., Jacobs 1979).

Finally, organizational theories examine the effect of processes within police organizations in producing increases or decreases in police strength. This class of theories is the least developed of the three discussed here. Typically, the only explanation offered in this line of research is organizational inertia: that changes in police strength are incremental and that the best predictor of police strength in a given year is its value in the prior year (known as a "lag"). Thus, unlike other perspectives, organizational explanations assume that changes in police strength are based on conditions internal to the organization. According to Nalla and his colleagues (1997):

this theoretical perspective assumes that organizational strength, as measured by annual budgets, is explained by incremental specification models whereby the present year's budget is influenced by appropriations in the previous year. (P. 120)

Studies have found evidence to support the organizational inertia explanation (Nalla 1992; Nalla, Lynch, and Leiber 1997). However, this explanation has at least two shortcomings: (1) it is banal in the sense that the lag value of any variable in a time series is nearly always the best predictor of the current value, and (2) while it is useful for understanding stability in police strength, it is not useful for understanding growth and decline over time.² Overall, the organizational explanations in this literature tend not to be well-specified, treating police organizations as a "black box." In other words, researchers use macro-level data about police organizations to draw inferences about the motivations and

behaviors of the actors within those organizations. Further developing this class of explanations will require researchers to open up the box and look inside. As Bayley (1985) notes: "we must get into the minds of decision-makers in order to determine the precise impetus to police growth" (p. 98).

In all, the studies drawn from these three theoretical perspectives have examined the effects of many different variables on police strength. As Maguire (1999) demonstrated, however, the effects of these variables remain unknown. Due to measurement error and other analytical problems, the results of the research are inconsistent. If these problems plague domestic research on police strength to such an extent, the world stage promises a whole new array of problems. In addition, as we will demonstrate shortly, theories of police strength that appear viable in domestic research probably require modification when applied to the comparison of nation-states.

Methods

The methods used in examining the determinants of police strength continue to grow more sophisticated, with recent refinements suggesting some excellent reasons for the mixed findings obtained in the past (Brandl, Chamlin, and Frank 1995; Snipes 1993). The relationship between police strength and crime rates is known as a "simultaneous" or "reciprocal" causal relationship because each one is known to cause the other. A variety of specialized methods have been devised by researchers to disentangle simultaneous causal effects. Since economists have a classic chicken-and-egg problem of their own — supply and demand — they have developed many of the statistical methods for dealing with simultaneity. While some of the early studies relied on improperly specified cross-sectional models that ignored the simultaneity issue, most of the studies done over the past two decades have relied on increasingly sophisticated cross-sectional and longitudinal models (Fisher and Nagin 1978; Maguire 1999). For this and other reasons, economists have done the bulk of the research on police strength. The findings from this research are not widely known for at least two reasons: (1) many of the articles appear in economic journals, and (2) the methods used are probably difficult for criminologists and policy makers to understand without advanced training in econometrics. We raise this issue here to highlight the methodological rigor necessary to investigate the causes, correlates, and consequences of police strength.

A Comparative Perspective on Police Strength

Studying police strength internationally presents a host of complications beyond those already described. First, there is no comprehensive source for international data on police strength. The U.N. World Crime Surveys (WCS) are the only

current source, but the police strength variables are recorded inconsistently. Second, even when data are available, as through the United Nations, there are often significant problems with data quality. Some of these are due to carelessness on the part of either responding nations or researchers, but others are due to legitimate questions regarding the definition of police. We will reserve our discussion of data quality issues for the next section. Finally, studying nations forces us to address new theoretical issues that are not as germane to western domestic research on police strength. Despite these issues, there is a small amount of comparative research on police strength, mostly by the American policing scholar David Bayley, on whose work we rely heavily in this section.

Measures of police strength are often difficult to compile within nations, especially in those nations described by Bayley (1985:59) as having decentralized multiple uncoordinated policing systems. The most notable of these is the United States, which has approximately 20,000 separate policing agencies, and which has historically had a difficult time estimating its own level of police strength (Bayley 1994; Maguire et al. 1998). If measuring police strength within nations is difficult, compiling comparative measures over time for nation states is much more so. While many nations have centralized statistical offices that keep track of such data, Bayley (1985) concludes that "except for a handful of countries, reliable information on police strength worldwide does not exist in any source available to the general public" (p. 75). Nearly fifteen years later, Bayley (1999:7) commented:

At the present time, it is not easy to find out about foreign police practices. Information about policing globally is not routinely collected in reference volumes or databanks. Although several helpful reference works have been published in the last few years, international information is still superficial and patchy in coverage (Andrade 1985, Kurian 1989, Fairchild 1993, Terrill 1995).

Despite the trend toward globalization and recent advances in the technologies used to process, archive, share, and transmit data, little is currently known about police strength internationally. Furthermore, as we will demonstrate in the following section, even when such data are available, they typically have a host of validity and reliability problems.

Earlier we reviewed some of the western research on police strength. While that body of research is useful for a number of reasons, there are legitimate questions about the extent to which its theories, methods, and findings are germane internationally (Bayley 1985). The research is helpful for generating a laundry list of independent variables thought to influence police strength, though as mentioned earlier, methodological problems make it difficult to draw any consistent inferences about the effects of these variables (Maguire 1999). These methodological problems have received sufficient attention, however, that researchers now know it is

inappropriate to investigate the causal influences on police strength using simplistic methods such as bivariate correlations. The methodological lessons learned in this body of research can be applied easily to international data once such data become available.

Perhaps the most useful contribution of the western research has been to consolidate the explanations for police strength into a handful of theoretical approaches. The three main theories used in domestic research on police strength were reviewed earlier: rational choice theory, conflict theory, and organizational theory. It is unclear how much these theories will need to be modified before they can be applied to the comparative international arena. For instance, Bayley (1985) repeatedly discusses the role of threats to collective order as influencing the emergence, structure, and strength of national police systems. Bayley's (1985) list of events constituting a threat to collective order would not be wholly applicable to domestic research in western nations like Canada, the United Kingdom, and the United States:

What kinds of events are commonly read as being threatening to the collective order? There are many possibilities: assassinations, kidnapping and intimidation of elite families, crippling strikes and boycotts, lawbreaking agitations, bombing of governmental property, and advocacy of the violent overthrow of the government. (P. 88)

While these kinds of events do occur within western nations, they cannot be used as explanatory variables in research on police strength because their rarity means that they will have too little useful variation to study. They are common enough internationally, however, that they could be fruitfully applied to comparative research.³ Another explanation that has been applied to the evolution of policing and legal systems, but not specifically to police strength is societal complexity (Schwartz and Miller 1964). If it is true that formal social control displaces (or replaces) informal social control, then as traditional social control mechanisms in simplistic societies begin to weaken with the onset of societal complexity, formal social control mechanisms like the police may increase in strength. Again, while this variable may vary little within nations, it varies tremendously between nations and would therefore need to be accounted for in comparative international research.

Bayley (1975) offers additional insights in his attempts to determine the factors causing the *development* of modern police systems. Although his focus was centered more around the *emergence* of police systems than their increase or decrease in strength, his findings regarding the police of Great Britain, France, Germany, and Italy might also reasonably be applied to the study of police strength. This argument is based on the premise that some of the same factors influential in the formation of modern police systems also have an effect upon subsequent levels of

police strength. Bayley (1975:351) identifies seven sets of variables that might account for increase or decrease in police strength: (1) growth and population distribution; (2) extent of criminality; (3) social/economic transformation; (4) political transformation; (5) change in governmental capabilities; (6) external threat; and (7) an ideological *demarche*. His findings here are not so remarkable for what factors did seem to influence the emergence and rate of development of police as for those that did not appear to have an effect. For instance, while population growth had no effect on the formation of police systems, "the impact of population growth and aggregation on the *size* of police establishments is indeterminable" (Bayley 1975:352). Similarly, he found that it was impossible to determine the extent to which crime or criminality affect police strength because of the well-known problems inherent in measuring crime cross-nationally.

Bayley (1975) concluded that three factors appeared to play a more significant role than others (albeit still not a very strong influence): "(1) a transformation in the organization of political power, (2) prolonged violent popular resistance to government, and (3) development of new law and order tasks, as well as the erosion of former bases of community authority, as a result of socioeconomic change" (p. 360). Once again, while Bayley highlights these factors as being pivotal influences on the *emergence* of policing systems, they also deserve attention in comparative international research on police strength. Space precludes us from highlighting all of the possible theoretical issues that might arise in using the domestic research from western nations as a foundation for comparative research on police strength. It is sufficient to emphasize that changing units of analysis from cities, states, or times within a single nation to nations as a whole means more than just using different data: it means adapting theories as well.

A small amount of research has actually explored the correlates and causes of police strength internationally. In his analysis of the cross-sectional correlates of police strength, Bayley (1985) used Taylor and Hudson's (1973) data on the strength of internal security forces in 136 nations in 1965. He acknowledges that these estimates overstate the number of police by including paramilitary units such as national guards in their counts. Nonetheless, he observes correctly that these data were really the only comprehensive source (though dated) available at the time. Bayley (1985) concludes from his analysis that: "In sum, then, variations in police strength among countries are explainable in terms of economic development and the strength of the military. Police strength is not related to domestic turmoil" (p. 79). Nonetheless, he urges caution in either accepting or abandoning these hypotheses given the age and nature of the data available to test them. He also examines factors associated with changes in police strength using time series data he collected from nine nations. Bayley (1985) concludes that increases in police strength are "related to variations in population. They may be related as well to the incidence of ordinary crime, but the evidence is equivocal" (p. 87). Furthermore,

his analysis offers some support for the organizational theory explanation for police growth discussed earlier (Nalla, Lynch, and Leiber 1997). Bayley (1985) finds that "there is a strong tendency for police strength to grow fairly automatically, probably because both population and crime are perceived to increase inevitably" (p. 87). This review has covered only a small portion of Bayley's findings. For a more exhaustive review of research and other information on international police strength, readers are urged to consult Chapter Four of Bayley's book *Patterns of Policing*, entitled "Police Strength." Although it is fifteen years old as this article goes to press, it still represents the most encyclopedic source on issues related to comparative international police strength.

Data and Methods

The only major source of international data on police strength that we could identify is the WCS series which has been conducted periodically since 1975, and which contains data beginning in 1970.⁴ So far, six waves of the survey have been conducted, with data from the first five waves archived at the Inter-University Consortium for Political and Social Research at the University of Michigan. Although data processing for the sixth wave was not completed at the time this article was being prepared, provisional data were released on the World Wide Web on March 15, 2000 (UNCJIN 2000).

We began by merging all six waves of the WCS data on police strength.⁵ Table 1 shows the police strength data available in each wave of the survey, together with the number of member states providing data. Several observations about this table are noteworthy. First, although every wave contains data on total police employees (including non-sworn or civilian police employees who are not police officers), only the fourth and fifth waves collected data on the number of sworn police officers. Second, the response patterns suggest that nations have an easier time providing data on total number of police employees than sworn police officers. Third, the number of responses for the survey has increased with each new wave, with the exception of the sixth wave for which only provisional data were available (although the number of member nations receiving surveys has increased as well). Finally, the intervals used for collecting police employment data have changed with nearly every wave of the survey. The first wave, which covered the years 1970 to 1975, contains police data for only 1973. In the second wave, which covered 1975 to 1980, police data were collected for every year. The third wave, covering 1980 to 1985, contains police data from 1980, 1982, and 1984. In the fourth and fifth waves, covering 1986 to 1990 and 1990 to 1994, police data were collected in the first and last years of the period under study (1986 and 1990, and 1990 and 1994). In the sixth wave, which covered 1995 to 1997, police data were collected for 1995 and 1997. Since the utility of a longitudinal data series relies

Table 1
Availability of Police Strength Data from the U.N. World Crime Surveys

Years	Wave	# Nations Providing Sworn Officer Data	# Nations Providing Total Employees Data
1973	1		29
1975	2		29
1976	2		30
1977	2		30
1978	2		30
1979	2		31
1980	2		34
1982	3		50
1984	3		50
1986 (a)	3		50
1986 (b)	4	44	50
1990 (a)	4	46	56
1990 (b)	5	46	56
1994	5	47	59
1995	6		35
1997	6		35

largely on the consistency with which it was assembled, we will discuss these issues further in the conclusion of the article. For now it is sufficient to note that these inconsistencies make it difficult, but not impossible, to draw inferences from the data.

The merged WCS data set contains several noteworthy problems. The most important problem is erratic reporting. Nations routinely respond to one wave but not the next, making it difficult to compile a longitudinal series helpful for drawing inferences about change. Others respond to multiple waves but provide inconsistent data. For example, only eight nations have consistently reported the number of total police employees in all of the first five waves of the survey (only partial data were available for the sixth survey at the time this article went to press). Since these nations responded consistently to each wave of the survey, it is tempting to assume that their responses are more reliable than those of nations reporting inconsistently. Figure 1 demonstrates the erratic nature of the police strength estimates reported by each of these nations. Due to large differences of scale in these eight nations, we chose to standardize the police strength estimates so that each nation starts with 1,000 police employees in 1973. To do this, we simply computed a correction factor, Z , as follows:

$$\frac{\text{Total Police Employees}}{Z} = 1,000$$

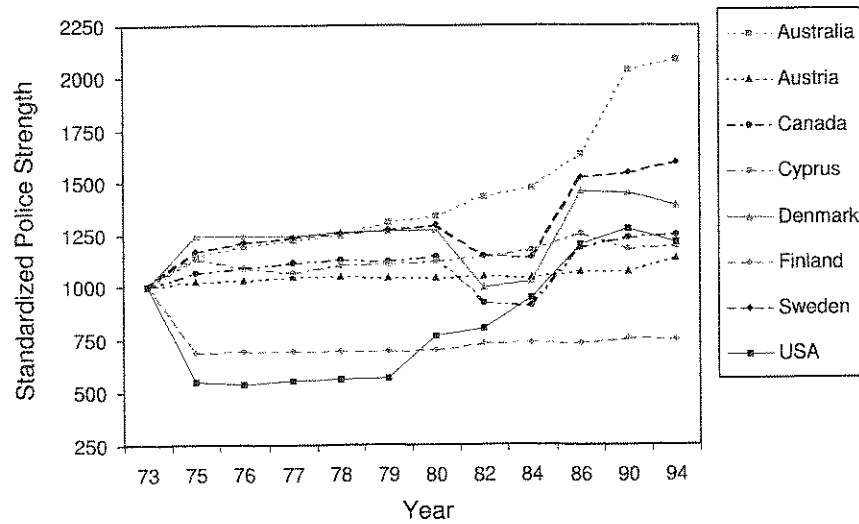


Figure 1. Nations with Complete Police Data for First Five World Crime Surveys.

Once the correction factor for each nation was computed, we divided it into the police strength estimate for each year to produce a standardized estimate.

The trajectories shown in Figure 1 are striking because they show the extreme discontinuities in the longitudinal series. The United States, for instance, has historically had trouble generating national estimates of its own police strength (Bayley 1994; Maguire et al. 1998). In 1973, the United States reported having more than 640,000 police employees. Two years later, that estimate dropped to approximately 350,000, where it remained fairly stable for several years before rising dramatically again. Unfortunately, this trajectory is purely fictional, telling us more about the shortcomings of data systems in the United States responsible for tracking police strength than about actual changes (Maguire et al. 1998; Eck and Maguire forthcoming). The United States is clearly not the only nation contributing erratic reports of police strength. Canada, despite having fewer police forces and a well-developed infrastructure for recording criminal justice statistics, reported having approximately 53,000 police employees in 1984 (during the third wave); in 1986, only two years later, the number rose to more than 69,000 employees (fourth wave). This increase did not represent a hiring boom in Canadian police agencies: it represented nothing more than measurement error. These two nations provide an interesting contrast. While the United States has lacked the capacity to provide valid and reliable estimates until just recently, Canada can easily provide such estimates. Statistics Canada offers online access (for a fee) to longitudinal data on police strength that appear to be much more reliable than the data series

Table 2
Concordance between Police Strength Estimates for Overlapping Years

	Total Employees	Total Employees	Sworn Officers
Year	1986	1990	1990
Waves	3 & 4	4 & 5	4 & 5
N	24	28	23
Correlation	.898	.955	.973
% Pairs with 0% Disparity	8.3%	17.9%	43.5%
% Pairs with <25% Disparity	58.3%	82.1%	69.6%
% Pairs with <50% Disparity	79.2%	82.1%	73.9%
% Pairs with >100% Disparity	8.3%	10.8%	13%

presented in Figure 1. This is a useful demonstration of the notion that erratic reporting does not have a single cause. It may reflect a poorly developed statistical capacity or simply carelessness on the part of reporting nations. We do not mean to focus only on Canada and the United States. Several other nations also provided erratic estimates of police strength. Clearly, however, erratic reporting is not only restricted to developing nations with poorly developed statistical capacities.

Further evidence can be used to shed some light on the nature of the erratic reporting problem. One method, for instance, is to examine carefully the overlapping years in which data were collected during consecutive waves. Respondents to both the third and fourth surveys provided data on the total number of police employees for 1986. Similarly, respondents to both the fourth and fifth surveys were asked to provide estimates of total police employment and the number of sworn officers for 1990. Table 2 shows the zero-order correlations between the responses in each of the three overlapping pairs of estimates. Observe that these correlations appear to be quite high, confirming the idea that high correlations can still conceal significant data problems.

Next, we computed the percentage differences for each pair of estimates using the following formula:

$$\frac{\text{Larger Estimate} - \text{Smaller Estimate}}{\text{Smaller Estimate}} = \% \text{ Difference}$$

For instance, if a nation reported having 1,000 officers in 1986 during the third survey, and then reported having 1,500 officers in 1986 during the fourth survey, the difference is 50 percent. Since we would expect minor fluctuations between survey waves, it may be more helpful to explore the distribution of these discrepancies. Table 2 demonstrates that very few nations provided the exact same estimate (0 percent discrepancy) of the number of officers or employees for the same year across separate waves of the survey. Approximately 60 to 80 percent of

the estimates have a discrepancy rate of 25 percent or less. So far, these findings suggest that most nations can provide approximate estimates of police strength with some degree of consistency, but that these estimates are usually not very precise (which represents a condition of strong reliability and weaker validity). However, approximately 8 to 13 percent of these pairs of estimates have a discrepancy rate of 100 percent or higher. Since a discrepancy rate of 100 percent means that the larger estimate is double the smaller estimate, these discrepancies clearly reflect serious measurement error. These larger errors were later filtered out during the data cleaning phase of our study. For those nations with minor discrepancies, a single estimate for each overlapping year was computed by taking the mean of the two estimates.

Once the WCS data were merged, checked, and cleaned, we provided additional data from numerous sources. The most important of these was a fax survey that we administered from March to June, 2000, to the embassies and permanent missions of 182 nations with fax numbers and diplomatic representation in the United States. The survey instrument asked for the number of sworn police officers, civilian police employees, and total police employees for even numbered years from 1988 to 2000. This survey produced 23 useable responses which, although it constitutes a very low response rate on its own, can be appended to the existing WCS data file. Another major source of data was an insightful article written by Newton (1998) on policing systems in the South Pacific, which included police strength estimates for twelve nations.⁶ Data on most of these nations were largely unavailable from any other source.

In addition to these major sources of additional data, we undertook a search of data from national police or statistical agencies. For instance, we eliminated the U.S. estimates since research has shown them all to be incorrect (Eck and Maguire forthcoming; Maguire et al. 1998). We were only able to replace these estimates with data for a single year (1996), since the most reliable estimates of police strength in the United States come from the 1996 Directory Survey of Law Enforcement Agencies (Reaves and Goldberg 1998). We replaced the Canadian estimates with data from Statistics Canada (2000) that lists the total number of police employees in the nation on its World Wide Web site. We replaced the data series for England and Wales with data available from the House of Commons (Policing Now 2000). We also replaced the data series for Scotland with data available from the Scottish Parliament (1999). Other sources, such as official documents or World Wide Web sites, were used to supplement the data set with data from seven additional nations.⁷ Finally, to compute estimates of relative police strength, we supplemented the data file with population estimates from the U.S. Census Bureau's (2000) International Database (IDB). The IDB is a computerized database containing demographic and socioeconomic data for 227 countries and

areas. When these estimates were unavailable (which was rare), we used local estimates from each nation.

Overall, the original longitudinal data file for the WCS was supplemented with additional data from 45 nations. The final data file, which we will refer to as the International Police Strength file (IPS), is not an ideal source for international information on police strength. Although we cleaned some of the obvious errors, it probably contains a host of more subtle errors that we were unable to detect. Nonetheless, to our knowledge, it represents the single most comprehensive source of current data on international police strength available today.

International Estimates of Police Strength

As discussed earlier, police strength has many meanings. It can be understood in both absolute and relative terms. Police strength can be computed relative to population, area, or workload (such as the number of crimes per officer). It can be computed using total police employees or sworn police officers. It can even be computed using only those police officers who actually "work the streets" (Chamlin and Langworthy 1996). In this section, we examine police strength relative to the population. Since estimates are available for both the number of sworn police officers and for total police employees, we compute the strength of each relative to the population. Table 3 presents the latest available estimate of sworn police officers per 1,000 population for the 83 nations in the IPS with valid data. The estimates are presented in descending order of relative police strength and range from more than 13 to just over one officer per 1,000 residents. The mean ratio of sworn officers per 1,000 residents in these 83 nations is 3.01.

Table 4 presents the same information for the 111 nations in the IPS with valid data on total police employees. The estimates are presented in descending order of relative police strength and range from more than 14 to only .02 police employees per 1,000 residents. We were unable to confirm whether the very low police strength estimates represented in the bottom right half of Table 4 are errors or true values. The mean ratio of police employees per 1,000 residents in these 111 nations is 3.44.

Despite numerous data problems, we have demonstrated here that it is possible to generate cross-sectional estimates of police strength for a large number of nations. The quality of the data is unknown. Therefore, the challenge now is to continue supplementing and refining the estimates provided here, updating them as new data become available. Then they can be used to test hypotheses about the factors producing national differences in police strength. At a minimum, these estimates are more useful for contemporary hypothesis testing than the 1965 Taylor and Hudson (1973) data on internal security forces used by Bayley (1985).

Table 3
Sworn Police Officers per Thousand Population

Nation	Year	#	Nation	Year	#
Saint Kitts and Nevis	1998	13.71	Ireland	1998	2.98
Antigua and Barbuda	1998	9.55	Hungary	1998	2.97
Singapore	1994	9.09	France	1994	2.95
Russia	1994	8.65	Scotland	1998	2.93
Northern Cyprus	1998	7.74	Kiribati	1994	2.91
Bermuda	1994	7	Czech Republic	1990	2.87
Uruguay	1994	6.8	Spain	1990	2.82
Niue	1990	6.71	Botswana	1990	2.68
Seychelles	1990	6.4	Marshall Islands	1994	2.54
Kuwait	1990	6.3	United States	1996	2.5
Mauritius	1994	6.3	Colombia	1994	2.48
Saint Vincent & the Grenadines	1994	6.03	Samoa	1994	2.47
Nauru	1998	5.9	England and Wales	1998	2.42
Tokelau	1991	5.71	Poland	1990	2.42
Italy	1998	5.68	Switzerland	1990	2.39
Hong Kong	1994	5.42	Fiji	1998	2.37
Kazakhstan	1994	5.21	Chile	1994	2.36
Lithuania	1998	5.01	Moldova	1994	2.35
Barbados	1990	4.57	Slovakia	1994	2.29
Malta	1998	4.55	Turkey	1998	2.26
Israel	1998	4.47	South Africa	1992	2.11
Tonga	1998	4.23	Solomon Islands	1998	2.05
Panama	1994	4.2	Liechtenstein	1998	2.03
Lebanon	1998	4.18	Swaziland	1990	2.02
Cook Islands	1991	3.96	Syria	1990	1.98
Ukraine	1994	3.95	New Zealand	1993	1.97
Latvia	1994	3.87	Greece	1990	1.96
Malaysia	1998	3.79	Romania	1994	1.95
Taiwan	1990	3.72	Australia	1994	1.92
Macedonia	1998	3.6	Denmark	1998	1.88
Austria	1998	3.57	Egypt	1994	1.88
Jamaica	1990	3.56	Korea, South	1990	1.87
Estonia	1994	3.55	Sweden	1998	1.85
Vanuatu	1998	3.44	Japan	1998	1.81
Slovenia	1994	3.43	Canada	1999	1.79
Croatia	1994	3.4	Finland	1998	1.53
Northern Ireland	1994	3.32	Norway	1990	1.37
Armenia	1986	3.24	Philippines	1994	1.36
Sri Lanka	1990	3.23	Nigeria	1998	1.09
Tuvalu	1991	3.21	Lesotho	1986	1.03
Peru	1994	3.16	Zambia	1994	1.01
Cyprus	1990	3.08			

Table 4
Total Police Employees per Thousand Population

Country	Year	#	Country	Year	#
Saint Kitts and Nevis	1998	14.1	Marshall Islands	1994	2.68
Russia	1994	12.22	Colombia	1994	2.67
Antigua and Barbuda	1998	9.7	Turkey	1998	2.64
Armenia	1990	9.52	Slovenia	1997	2.6
Cayman Islands	1986	8.49	Poland	1995	2.58
Bermuda	1994	8.4	Samoa	1994	2.56
Uruguay	1994	8.24	Netherlands	1990	2.54
Northern Cyprus	1998	7.95	Paraguay	1998	2.51
Kazakhstan	1994	7.8	Luxembourg	1990	2.5
Gibraltar	1986	7.79	Canada	1994	2.49
Mauritius	1994	7.43	Singapore	1997	2.49
Seychelles	1990	7.38	Sweden	1998	2.48
The Bahamas	1997	7.03	New Zealand	1993	2.44
Northern Ireland	1997	6.83	Denmark	1998	2.43
Jordan	1990	6.21	Romania	1997	2.42
Saint Vincent & Grenadines	1994	6.03	Liechtenstein	1998	2.38
Italy	1998	5.97	Fiji	1997	2.37
Hong Kong	1997	5.9	Andorra	1997	2.35
Cyprus	1997	5.5	Iceland	1997	2.25
Dominica	1986	5.09	Swaziland	1990	2.2
Lithuania	1997	4.99	Japan	1998	2.09
Malta	1998	4.99	Australia	1997	2.05
Panama	1997	4.99	Syria	1990	2.01
Macedonia	1998	4.72	Finland	1998	2
Latvia	1994	4.63	Switzerland	1997	1.99
Albania	1997	4.59	Korea, South	1997	1.94
Israel	1998	4.57	Nepal	1990	1.61
Portugal	1997	4.57	Moldova	1997	1.55
Croatia	1997	4.45	Nicaragua	1994	1.53
Lebanon	1998	4.28	Philippines	1994	1.46
Ukraine	1994	4.2	Honduras	1986	1.42
Peru	1994	4.12	Norway	1990	1.41
Tonga	1997	4.06	India	1994	1.35
Malaysia	1998	4.05	Burma	1990	1.33
Czech Republic	1997	4.02	Spain	1997	1.26
Vanuatu	1990	3.95	Zambia	1994	1.15
Trinidad and Tobago	1990	3.94	Nigeria	1998	1.13
Hungary	1998	3.93	Argentina	1986	1.02
Scotland	1997	3.81	Morocco	1994	0.99
Jamaica	1990	3.79	Zimbabwe	1995	0.96
Greece	1997	3.72	Liberia	1986	0.92
Saint Helena	1986	3.61	Lesotho	1997	0.85
Austria	1998	3.57	Bangladesh	1986	0.73

Table 4
(Continued)

Country	Year	#	Country	Year	#
Slovakia	1994	3.52	China	1990	0.72
France	1994	3.48	Uganda	1995	0.71
United States	1996	3.47	Malawi	1986	0.62
Belgium	1994	3.43	Egypt	1994	0.35
England and Wales	1998	3.43	Venezuela	1990	0.28
Kuwait	1990	3.36	Maldives	1990	0.25
Ireland	1998	3.19	Madagascar	1994	0.24
Sri Lanka	1997	3.09	Costa Rica	1990	0.16
Kiribati	1994	3.04	Rwanda	1990	0.08
Estonia	1997	3.02	Mexico	1994	0.05
South Africa	1992	2.86	Burundi	1986	0.03
Chile	1994	2.75	Ethiopia	1990	0.02
Botswana	1990	2.7			

Changes in Relative Police Strength

Is the world's policing establishment growing, shrinking, or remaining stable relative to the population? Bayley (1985) found that the absolute number of police had increased dramatically over the past 150 years. "In relation to population, however, there has not been a uniform intensification of policing" (p. 80). Bayley's (1994) later research in five nations found that police strength relative to population had increased from 1970 to 1990 by 32 percent in Australia, 24.5 percent in Britain, 15.5 percent in Canada, 4 percent in Japan, and 26 percent in the United States.⁸

To answer this question, it was necessary to deal with the tremendous amounts of missing data in the IPS. Much of the missing data can be attributed to gaps in the WCS questions on police strength. For instance, while the second WCS collected police strength data for every year the survey covered (1975 to 1980), subsequent surveys asked for either all even numbered years (the third survey asked for 1980, 1982, and 1984), or only the beginning and ending years of the survey period (fourth survey: 1986 and 1990; fifth survey: 1990 and 1994; and sixth survey: 1995 and 1997). To some extent these decisions are understandable. The WCS instruments have historically been quite long and have generated low item and survey response rates. These measures were likely taken to decrease respondent fatigue and improve response rates. On the other hand, the result of these decisions is that longitudinal data on police strength contains uneven gaps with missing data in between. It is almost impossible to draw reliable inferences about change without addressing the missing data problem.

Numerous methods are now available to deal with missing data. In fact, statisticians have devoted an enormous amount of attention in recent years to the treatment of missing data in social science research (Schafer 1997). The approach that we have chosen is both conservative and easy to understand. Because we are not building causal models, many of the new methods that rely on multiple imputation or full information maximum likelihood procedures are less defensible and are not likely to outperform more simplistic approaches. Therefore, we have chosen to use linear interpolation, which simply means replacing missing values that occur between two valid data points with values that will render the series linear. In other words, if a nation reports having 500 officers in 1990 and 1,000 officers in 1995, linear interpolation will produce an estimate of 600 in 1991, 700 in 1992, 800 in 1993 and 900 in 1994. We want to emphasize that we are interpolating only those missing values that lie between valid estimates, not extrapolating, or filling in missing values outside the valid range of a data series.

Table 5 shows relative police strength estimates for both sworn officers and total police employees from 1986 to 2000. The ratio of *sworn officers* to residents ranges from 2.88 in 1986 to 4.12 in 1999. The series mean for the sworn officer ratio is 3.38, which is based on 626 separate country-year estimates. While the number of nations with valid estimates drops considerably after 1994 (when the sworn officer question was dropped from the WCS instrument), it is clear that police strength, as measured using sworn officers, is increasing relative to the population. From 1986 to 1994, the period when valid data were most numerous, relative sworn strength rose by 26 percent. If one accepts the ratio reported in 2000 as valid, then relative sworn police strength has increased by more than 36 percent since 1986.

The ratio of *police employees* to residents ranges from 3.37 in 1986 to 4.51 in 1999. The series mean for the police employee ratio is 3.73, which is based on 862 separate country-year estimates. While the number of nations with valid estimates drops considerably after 1997 (the last year for which data were available from the sixth WCS), it is clear that police strength, as measured using total police employees, is increasing relative to the population. From 1986 to 1997, the period when valid data were most numerous, relative police employee strength rose by more than 12 percent. If one accepts the ratio reported in 2000 as valid, then relative police employee strength has increased by nearly 33 percent since 1986.

While exact estimates of the growth in police strength relative to population are not prudent given the data problems we have described, we believe the data are more than sufficient to warrant the overall conclusion that increases in police strength are outpacing increases in population. Furthermore, although we have not directly addressed trends in hiring non-sworn or civilian policing employees, the fact that increases in sworn personnel are larger than increases in total personnel suggests that a greater portion of the increase in police strength is due to sworn

Table 5
Changes in Relative Police Strength, 1986-2000

Year	Sworn Police Officers per 1,000		Total Police Employees per 1,000	
	Mean	N	Mean	N
1986	2.88	41	3.37	74
1987	2.97	39	3.48	64
1988	3.11	48	3.58	70
1989	3.09	48	3.59	70
1990	3.18	73	3.50	89
1991	3.35	57	3.82	68
1992	3.33	56	3.87	71
1993	3.40	56	3.91	70
1994	3.63	57	3.92	72
1995	3.68	26	3.61	50
1996	3.67	27	3.75	49
1997	3.82	26	3.79	49
1998	3.86	29	4.28	24
1999	4.12	21	4.51	21
2000	3.94	22	4.47	21
Overall	3.38	626	3.73	862

officers rather than civilian or non-sworn employees. Thus, the growth in sworn police officers is outpacing the growth in both population and in non-sworn policing employees. We will discuss this finding more thoroughly in the following section.

Discussion and Conclusion

This article has explored several issues related to the data, methods, and theories used to investigate police strength in comparative international research. Our research highlights a number of findings related to data, methods, and theory. In this section we review our findings and explore their implications for future studies in this area.

While increasing attention has focused on world policing in the past two decades, there is no authoritative and current source of information on the structures and practices of policing throughout the world. Since description necessarily precedes inference in social inquiry, the comparative international study of policing remains in its infancy. As Bayley (1985) notes: "the fact that data as elementary as the number of police personnel is unavailable internationally indicates how limited understanding is of policing and law enforcement in the world today" (p. 75-76). We have demonstrated that it is now possible to construct a current database on the

police strength of nations, though the quality of the data is uneven, and in many cases, unknown.

In the course of assembling our IPS file, we learned a number of lessons that may be useful in future research. First, while the WCS is the only comprehensive longitudinal data source on police strength, the frequent redesign of the survey instrument, erratic reporting practices, and the high frequency of data errors make the data set very difficult to use. Any conclusions drawn from it alone are likely to be tentative or unreliable. We urge the United Nations to adopt consistency in the police strength portion of its WCS survey instrument. Furthermore, data should be collected every year, with overlapping years between separate waves of the survey. The overlapping years serve as important reliability checks, since differences in estimates for the same year provide a visible red flag that something is wrong with the data. The questions on sworn police officers should be reinstated and data filled in for the missing years. The number of police officers is an elemental fact describing the criminal justice system of a nation, and is certainly worthy of survey space. Finally, while we support the United Nations' efforts to make survey data available as quickly as possible, the police strength estimates from the sixth survey contain a number of obvious data entry errors that should be cleaned before releasing the data to the public. We sincerely hope that with these changes, the United Nations can ensure that the WCS meets the needs of researchers and policy makers who rely on the data.

In addition to using data from the WCS, we also attempted to collect our own data by fielding a brief fax survey to the embassies or permanent missions of 182 nations with diplomatic representation in the United States and working fax numbers. At the time this article went to press, only 23 nations had provided useable responses (12.6 percent). Several other nations promised replies, but these were not expected to arrive until after the article was completed. While this survey was not nearly as successful as we hoped, it did provide valuable data that we appended to the other data sources used in this study. What does this mean for the future of data collection on police strength? Bayley (1999) argues that:

Embassies are not particularly helpful, tending to view policing as a sensitive matter and generally not having information about police ready-to-hand. Trying to work through embassies to construct an informative sample of global experience is an uncertain and tedious process. For many topics, therefore, the only alternative is to develop local informants in foreign countries or visit the countries personally. These processes are costly and time-consuming (p. 7)

Since traveling to a country personally to collect police strength data is expensive, perhaps the best way for individual researchers to amass data on police practices around the globe is to develop a network of local informants who can provide reliable and valid information.

In addition to better data, we urge future researchers in this area to learn from the methodological experiences of the domestic western research introduced in this article. The relationship between police strength and crime (and other variables) is exceedingly complex, like the supply and demand relationship studied by economists, and statistical methods need to account for this complexity. Simple bivariate correlations, even when they use lags to control for simultaneity, have no place in testing hypotheses about simultaneous causal relationships (for a more detailed review of these issues, see Fisher and Nagin 1978, or Marvell and Moody 1996).

Once quality data on police strength worldwide become available, how shall we use them? Theories of police strength come largely from domestic research in western nations and may not be applicable to comparative international research. Thus, in addition to challenging researchers to collect new and better data, we also issue a challenge to develop new theoretical frameworks that can accommodate all research on police strength, domestic or international. This means determining whether variables unique to world research fit within existing theories or must be cast within new theories. Once that is done, then hypothesis testing on the factors influencing police strength throughout the world can begin in earnest.

Another challenge for comparative sociologists is to develop an explanation for why police strength has outpaced population growth over the past 15 years. According to Bayley (1985), while police grew in absolute numbers over the 150 year period following their emergence in the early nineteenth century, they did not uniformly grow relative to population. The research we presented in the previous section demonstrates that the stability identified by Bayley is being followed by a period of steady growth. Police, as an institution, represent a formal mechanism of social control established by states to maintain internal order by force or threat of force. Their increase relative to population growth needs to be explored, both empirically, as we have done here, but also theoretically. Unlike many of the idiosyncratic research questions explored in research on policing, explaining increases in social control, especially on a global scale, represents a fundamental sociological question. Crime is an obvious answer, but the research, both domestic and international, is not so clear (Bayley 1985; Eck and Maguire forthcoming; Gurr 1979; Maguire 1999). Increasing levels of social complexity may be another answer; though designing research to address this hypothesis would be difficult (Bayley 1985; Schwartz and Miller 1964). Regardless of the answer, the question is both important and fundamental, and deserves attention by researchers and theorists alike.

NOTES

- 1 Researchers using police expenditures justify their choice on the basis that policing is a personnel intensive industry, and there is an almost perfect correlation between the number of police personnel that a jurisdiction employs and the amount it spends on police protection. While the correlation is indeed strong, it is inconsistent over time and place and therefore makes a poor proxy for the number of sworn police officers or employees (Maguire 1999).
- 2 As Chamlin and Langworthy (1996) conclude: "once one controls for prior levels of police force size, there is little variance to be explained by any theoretically derived predictors" (p. 181).
- 3 Perhaps the closest analogue was American research that used data from the turbulent 1960s period to examine the effect of riots on police strength (Jacobs 1979).
- 4 Although several survey items are measured as early as 1970, police strength estimates are only available starting in 1973.
- 5 We should note that although the WCS has periodically collected data on the gender of police employees, we chose not to include that information here.
- 6 These nations included the Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, and Vanuatu.
- 7 These alternative sources provided additional data for Bermuda, Lithuania, New Zealand, Poland, South Africa, Sweden, and Taiwan.
- 8 As noted earlier, readers are urged to use caution with any longitudinal estimates of police strength in the United States.

REFERENCES

- ANDRADE, J.
1985 *World Police and Paramilitary Forces*. New York: Stockton Press.
- BAYLEY, David H.
1975 "The Police and Political Development in Europe." Pp. 328-79 in *The Formation of National States in Western Europe*, edited by C. Tilly. Princeton, NJ: Princeton University Press.
1985 *Patterns of Policing: A Comparative International Analysis*. New Brunswick, NJ: Rutgers University Press.
1992 "Comparative Organization of the Police in English-Speaking Countries." Pp. 509-46 in *Modern Policing*, edited by M. Tonry and N. Morris. Chicago: University of Chicago Press.
1994 *Police for the Future*. New York: Oxford University Press.
1999 "Policing: The World Stage." Pp. 3-12 in *Policing Across the World: Issues for the Twenty-first Century*, edited by R.I. Mawby. London: UCL Press.
- BRANDL, Steven G., Mitchell B. CHAMLIN and James FRANK
1995 "Aggregation Bias and the Capacity for Formal Crime Control: The Determinants of Total and Disaggregated Police Force Size in Milwaukee, 1934-1987." *Justice Quarterly* 12:543-62.
- CHAIKEN, Jan M.
1975 *Patrol Allocation Methodology for Police Departments*. Santa Monica, CA: Rand Corporation.
- CHAMLIN, Mitchell B. and Robert H. LANGWORTHY
1996 "The Police, Crime, and Economic Theory: A Replication and Extension." *American Journal of Criminal Justice* 20:165-82.

- ECK, John E. and Edward R. MAGUIRE
2000 "Have Changes in Policing Reduced Violent Crime?" In *The Crime Drop in America*, edited by A. Blumstein and J. Wallman. New York: Cambridge University Press.
- FAIRCHILD, Erika
1993 *Comparative Criminal Justice Systems*. Belmont, CA: Wadsworth.
- FISHER, Franklin M. and Daniel NAGIN
1978 "On the Feasibility of Identifying the Crime Function in a Simultaneous Model of Crime Rates and Sanction Levels." Pp. 361-399 in *Deterrence and Incapacitation: Estimating the Effects of Criminal Sanctions on Crime Rates*, edited by A. Blumstein, J. Cohen and D. Nagin. Washington, D.C.: National Academy of Sciences.
- GURR, Ted Robert
1979 "On the History of Violent Crime in Europe and America." Pp. 353-374 in *Violence in America: Historical and Comparative Perspectives*, edited by H.D. Graham and T.R. Gurr. Beverly Hills: Sage.
- JACKSON, Pamela and Leo CARROLL
1981 "Race and the War on Crime: The Sociopolitical Determinants of Municipal Police Expenditures in 90 Non-Southern U.S. Cities." *American Sociological Review* 46:290-305.
- JACOBS, David
1979 "Inequality and Police Strength: Conflict Theory and Coercive Control in Metropolitan Areas." *American Sociological Review* 44:913-25.
- KURIAN, G.T.
1989 *World Encyclopedia of Police and Penal Systems*. New York: Facts on File.
- LARSON, Richard C.
1978 *Police Deployment: New Tools for Planners*. New York: Lexington Books.
- LISKA, Allen E., Joseph J. LAWRENCE and Michael BENSON
1981 "Perspectives on the Legal Order: The Capacity for Social Control." *American Journal of Sociology* 87:413-26.
- LOFTIN, Colin and David MCDOWALL
1982 "The Police, Crime, and Economic Theory: An Assessment." *American Sociological Review* 47:393-401.
- MAGUIRE, Edward R.
1999 "Research Evidence on the Factors Influencing Police Strength in the United States." Urban Institute, Washington, D.C.: Unpublished report.
- MAGUIRE, Edward R., Jeffrey B. SNIPES, Craig D. UCHIDA and Margaret TOWNSEND
1998 "Counting Cops: Estimating the Number of Police Officers and Police Agencies in the United States." *Policing: An International Journal of Police Strategies and Management* 21:97-120.
- MARVELL, Thomas B. and Carlisle E. MOODY
1996 "Specification Problems, Police Levels, and Crime Rates." *Criminology* 34:609-46.
- NALLA, Mahesh K.
1992 "Perspectives on the Growth of Police Bureaucracies, 1948-1984: An Examination of Three Explanations." *Policing and Society* 3:51-61.
- NALLA, Mahesh K., Michael J. LYNCH and Michael J. LEIBER
1997 "Determinants of Police Growth in Phoenix, 1950-1988." *Justice Quarterly* 14:115-143.

- NEWTON, Tess
1998 "An Introduction to Policing in the South Pacific Region." Working Paper, *Journal of South Pacific Law* (Volume 2). University of the South Pacific (http://www.vanuatu.usp.ac.fj/sp_law_journal/journal_main.html).
- O'BOYLE, E.H.
1990 "Manpower: Meeting the Demands of a Growing Department." *The Extra Mile* 1:1-7.
- POLICING NOW
2000 "Police Officers and Civilian Staff by Police Forces in England and Wales for Each Year Since 1970." Retrieved June 1, 2000 (<http://www.policingnow.com/stats/opening.html>).
- REAVES, Brian A. and Andrew L. GOLDBERG
1998 *Census of State and Local Law Enforcement Agencies, 1996*. Washington, D.C.: Bureau of Justice Statistics (June 1998): NCJ-164618.
- SCHAFFER, Joseph L.
1997 *Analysis of Incomplete Multivariate Data*. London: Chapman and Hall.
- SCHWARTZ, Richard D. and James C. MILLER
1964 "Legal Evolution and Societal Complexity." *American Journal of Sociology* 70:159-69.
- SCOTTISH PARLIAMENT
1999 "Written Answers, Tuesday 17 August 1999." Scottish Executive. Retrieved June 1, 2000 (http://www.scottish.parliament.uk/official_report/wa99-00/wa0817.htm).
- SLOVAK, Jeffrey S.
1986 *Styles of Urban Policing: Organization, Environment, and Police Styles in Selected American Cities*. New York: New York University Press.
- SNIPES, Jeffrey B.
1993 "Issues and Refinements in Modeling Macro-level Threat Theory." Department of Criminal Justice, State University of New York, Albany, NY. Unpublished paper.
- STATISTICS CANADA
2000 "Number of Police Officers, and by Population Per Police Officer; for Canada the Provinces and Territories, Annual." Retrieved June 1, 2000 (<http://www.statcan.ca/cgi-bin/Cansim/cansim?matrix=301>).
- STENZEL, W.
1993 *Police Personnel Allocation Manual User's Guide: Determination of the Number and Allocation of Personnel for Patrol and Traffic Services for Municipal Law Enforcement Agencies*. Chicago: Northwestern University Traffic Institute.
- TAYLOR, Charles and Michael C. HUDSON
1973 *World Handbook of Political and Social Indicators*, 2nd ed. Ann Arbor, MI: Inter-University Consortium for Political Research.
- TERRILL, Richard J.
1995 *World Criminal Justice Systems: A Survey*. Cincinnati, OH: Anderson Publishing Company.
- UNCJIN
2000 "United Nations Surveys on Crime Trends and the Operations of Criminal Justice Systems." United Nations Crime and Justice Information Network. Retrieved June 1, 2000 (<http://www.uncjin.org/Statistics/WCTS/wcts.html>).
- UNITED STATES CENSUS BUREAU
2000 "International Data Base." Retrieved June 1, 2000 (<http://www.census.gov/ipc/www/idbnew.html>).

UNITED STATES DEPARTMENT OF STATE

1999 Annual Report on Military Expenditures 1988. Report presented to the House and Senate Appropriations Committees on February 15, 1999.

Women, Justice, and Custom: the Discourse of “Good Custom” and “Bad Custom” in Papua New Guinea and Canada*

CYNDI BANKS

ABSTRACT

Court decisions involving custom, the rights of women, and positivist law in Papua New Guinea and Canada are explored and contrasted. In Papua New Guinea the courts have struck down aspects of custom or customary law as being repugnant to the general principles of humanity and in violation of positivist law. In Canada men have argued for the application of custom as a mitigating factor in sentencing, asserting that it offers justification for conduct against women judged criminal under positivist law. Examining judicial discourse on custom or customary law in the two countries illuminates the tensions between custom and positivist law, revealing how custom comes to be judged “good” or “bad” and is reframed as non-normative in one country but as an appropriate cultural component in sentencing in the other.

Papua New Guinea¹

ON 3 MAY 1996, the *Post-Courier*, one of the two daily newspapers circulating in Papua New Guinea, carried the following headline on its front page:

“Girl Sold in Death Compo”

The story revealed that a “young girl” (later identified as Miriam Willingal) had “been included as part of a compensation payment to be made to the relatives of a man recently shot dead by the police” (*Post-Courier* 1996). The maternal uncles of Koi Dam, the deceased man, had demanded either a “young girl” or K20,000² together with pigs, and the villagers (Miriam’s relatives) had agreed to give Miriam

* Direct Correspondence to Assistant Professor Cyndi Banks, Northern Arizona University, Department of Criminal Justice, P.O. Box 15005, Flagstaff, Arizona, 86011, USA.