

Do Police Cause Crime: A Replication

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### Abstract

What is the relationship between police strength and reported crime rates? Are more police authorized in response to increased rates of crime or are increased crime rates a response to increased police strength? A correlational analysis by Koenig (1991) focusing on national level data from 1962 to 1988 suggests a tendency for increased police strength to precede increased crime rates. Using data from the ten Canadian provinces, this study replicates the approach taken by Koenig. Sworn police strength is correlated with selected crime rates from 1962 to 1988 to explore whether a relationship exists at the provincial level between police strength and crime rates. Temporal associations are examined through the use of lagged correlations. The crime rates examined include robbery, all violent crimes, break and enter, all property crimes, criminal code offences, and total offences. In order to control for variations in the age and sex structure of the population, each of these crime rates are expressed per 1,000 population male and per 1,000 population male of various ages. Controls are also introduced for unemployment, inflation (in the form of the consumer price index), and time.

The analysis of the provincial data is relatively consistent with the national level which it is seeking to replicate. There is a congruence in terms of the three major findings. First, both analyses reveal a zero order positive association

between crime rates and police strength, and police strength and crime rates, both in lagged and unlagged correlations. Thus, it appears that per capita police strength and crime rates have been moving in tandem over the 27 year period of study.

Second, the provincial analysis reveals a general pattern of positive associations between per capita police strength and subsequent levels of selected crimes when unemployment, consumer price index and time are controlled. Thus, it appears that, in most provinces, increased police strength tends to precede increased reported rates of crime when controls are introduced for unemployment, consumer price index, and time. Increased police strength per capita has typically been associated with subsequent increases in the reported rates of selected crimes (i.e. robbery, break and enter, all property offences, criminal code offences and total offences).

Third, both analyses find that violent crime has a dynamic of its own. Consistent with Koenig's analysis, this analysis reveals a negative association between lagged police strength and subsequent reported rates of violence at the provincial level. While reported levels of violence continue to increase, this analysis suggests that provincially reported rates of violence have at least been moderated by increased police strength.

While the provincial level analysis is, for the most part, supportive of Koenig's general findings, the nature of the associations between crime rates and police strength were not uniformly consistent with the national level analysis. In

terms of the tendency for positive associations between police strength and subsequent reported levels of crime, the data from the three most westerly provinces, British Columbia, Alberta, and Saskatchewan, are not consistent with the majority analysis. In addition, the absence of any consistent relationship between lagged police strength and subsequent rates of violence in Quebec is a deviation from the national findings.

Possible explanations for selected provincial deviations from the national level analysis are deficiencies in the provincial data and factors at the provincial level may influence the relationship between reported crime and police strength.

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## Chapter 1 - Introduction

The focus of this thesis is the relationship between police strength and crime rates. Using correlational analysis, Koenig (1991) explored the relationship between Canadian crime rates and per capita police strength for the period 1962 to 1988. Koenig found a tendency for increased police strength to precede increased crime rates for the 27-year period. The trend in violent crime did not fit this generalization, however, with lower levels of per capita police strength associated with higher subsequent rates of violent crime. Koenig (1991:iii) argues that "increased levels of [reported] violence provide the rationale for increased levels of police strength, but that these increased levels of police strength merely generate increased police activity, which has not necessarily been well targeted at containing violent crime."

A limitation of the Koenig study was the level of aggregated data used. Koenig asserts that "One would have greater confidence in the findings if each province or each municipal police department had been analyzed and a reasonably consistent pattern at the level of individual departments, or at least the level of provinces were found" (Koenig:1991:30). This research responds to that request. This study replicates the approach taken by Koenig. However, the ten Canadian provinces, as opposed to Canada as a whole, are the units of analysis. If the findings observed at the provincial level, are consistent with those for the

national level data, this thesis will lend further support to Koenig's conclusions.

In this study, sworn police strength is correlated with selected crime rates from 1962 to 1988 to explore whether a systematic relationship exists at the provincial level between per capita police strength and reported crime rates.<sup>1</sup>

Specifically, the questions are:

- 1) Do increased levels of police strength per capita precede, follow or occur concurrently with increased rates of reported crime (robbery, break and enter, all property crimes, all criminal code offences, and total offences)? and
- 2) Do reported rates of violent crime have a dynamic of their own? Are higher levels of police strength associated with subsequent rates of violence which are lower than they otherwise would have been?

This section has provided an orientation to the study and to what follows.

In the second chapter, the relevant literature is reviewed. The third chapter

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<sup>1</sup> Three levels of government have responsibility for policing in Canada. The Federal government (through the RCMP) is responsible for the enforcement of Federal Statutes and Executive Orders in each province and territory, as well as the provision of law enforcement services such as forensic labs, identification services Canadian Police Information Centre (CPIC) and the Canadian Police College.

Each province assumes responsibility for its own municipal and provincial policing. Provincial legislation in most provinces requires that cities and towns maintain their own municipal force once reaching a certain population (between 1,500 and 5,000). Municipal policing consists of the enforcement of the Criminal Code, provincial statutes and municipal by-laws within the boundaries of the municipality.

Provincial policing consists of the enforcement of the Criminal Code and provincial statutes in mainly rural areas of the province not policed by a municipal force. In some cases, there may be an overlapping of policing boundaries.

Provinces may contract with the RCMP to do municipal or rural policing. All provinces except Newfoundland, Quebec, and Ontario have some RCMP municipal contract policing. Both Ontario and Quebec have their own provincial police forces. While in Newfoundland, provincial policing is shared with the Royal Newfoundland Constabulary.

contains the methodology, while the fourth presents the results of the data analysis. Finally, in the fifth chapter is found a discussion and interpretation of the findings.

## Chapter 2 - Review of the Literature

The focus of this thesis is on the relationship between police strength and reported rates of crime. Political discussions surrounding the allocation of resources often focus on increasing staff and resources to combat an increasing crime rate. Such discussions are clearly based on a belief that police strength has an inhibiting effect on rates of crime. Whether police fulfil this function so often ascribed to them remains disputable. The determination of any such relationship between police strength and reported rates of crime has ramifications for crime control policy and the allocation of resources.

Several attempts have been made to specify the nature of the relationship between police strength and crime rates. Basically, however, there are two opposing points of view. Explanations can be classified, albeit grossly, as either crime reduction hypotheses or system capacity hypotheses. The two perspectives differ as to the temporal associations between reported rates of crime and police strength. Researchers in the crime reduction tradition argue that increased police strength will minimize increased rates of crime. Those within the system capacity tradition see increased rates of crime as the result of increased police resources as these increased police resources allow for an increased reporting of crime.

The system capacity model focuses on the capacity of the criminal justice system to respond to violators of the law and argue that additional police creates

an increased capacity for uncovering the physical existence of crime. Therefore higher, not lower, reported rates of crime will result.

This thesis tests the system capacity model of policing. Koenig (1991) found a tendency for increased police strength to precede increased rates of crime. This finding lends support to a system capacity interpretation. His findings question the utility of adding more police to fight increasing crime rates. While Koenig's findings are based on national level data, this thesis seeks to determine if the same tendency will hold with provincial level data.

In contrast, the crime reduction perspective assumes there are deterrent and incapacitative effects offered by additional police strength. Increased police strength is believed to offer increased visibility and increased certainty of detection, apprehension and conviction, thus, deterring others and incapacitating the crime prone. Proponents of this perspective believe that in response to increased rates of crime, the general populace will authorize increased resources for crime control.

The crime reduction hypothesis is inherently a deterrence hypothesis. Deterrence is based on the premise that the "penal sanction will reduce the propensity at the individual (specific) or aggregate (general) level to commit crime" (Duffee and Fitch:1976:4-5). The hypothesis underlying deterrence rests on a rational picture of man. It rests on the assumption that individual behaviour responds to incentives - in particular to negative sanctions inherent in the criminal

justice system. A further presumption is that differences in sanctions are somehow perceived by the population of potential criminals. The imposition of sanctions on detected offenders serves to discourage at least some others from engaging in similar pursuits. Thus, if deterrence works, one should be able to detect shifts in the overall crime-committing behaviour (and population) because of shifts in the risk of imposition of sanctions or in the severity of sanctions imposed.

Within this tradition, the two variable aspects of law enforcement which determine crime reducing benefits are the certainty and severity of law enforcement. Certainty refers to the likelihood of sanctions being applied. Severity refers to frequency or type of law enforcement. The greater the severity and/or certainty of law enforcement the greater the crime reducing benefits are believed to be. Thus, all theories of deterrence predict a negative association between sanction levels, sanction risk or both; all tests of association search for that negative association (Blumstein et al:1978:4). The following quote from Hagan (ed:1982:7) provides insight as to the diversity of sociological perspectives which pay heed, explicitly or implicitly, to such an association:

"Durkheim's (1950) assertion that the punishment of crime is a normal and necessary part of the 'social health' involves an implicit assumption that there is a general deterrent effect that can accompany the imposition of criminal sanctions. Mead's (1928) assertion that the use of criminal law is a 'two-sided sword' that creates a 'permanent class of deviants' while it simultaneously may

deter others amounts to an acknowledgement of general deterrence, along with a rejection of the notion of specific deterrence. Most interesting, however, is Gibbs (1978) observation that, the secret scandal of the marxist theory of criminal law is that it tacitly attributes validity to the deterrence doctrine. The attribution can best be grasped by contemplating a question: How can legal punishments be used as a repressive instrument by a dominant class if the threat of punishment does not deter?"

There are several possible explanations of the internal psychological explanations by which sanctions discourage crime. According to Duffee and Fitch (1978:4), for example:

"Both specific deterrence and rehabilitation are attempts to change the offender's desire to reoffend by changing his perceptions of the criminal act. Deterrence may be defined as a threat applied to an unchanged offender who is inclined to repeat the offence, but whose fear that the punishment will be repeated keeps him from committing the act. In contrast, rehabilitation can be defined as the manipulation of the offender so that when he is confronted with the possibility of repeating the criminal act, he will not want to commit it".

Clearly, the imposition of criminal sanctions may result in the same outcome (i.e. less crime) through several processes. Gibbs (1957:Chapter 3), for example, outlines 15 ways by which arrest alone may result in less crime. Blumstein et al. (1978) point out that there is no empirical basis for distinguishing deterrence from other interpretations of the same behavioral response, such as normative validation or the moral effects of punishment.

The Panel on Research on Deterrence and Incapacitative Effects (Blumstein et al.:1978:16-17), did not deem it necessary to distinguish among the alternative

interpretations of the internal psychological mechanisms by which sanctions discourage crime. All effects are included in what they called the "deterrent effect of sanctions." All theories can be grouped together as they are all variations of the same crime reduction hypothesis. They are saying that if you increase the severity or certainty of punishment, the amount of crime will decrease.

The Panel on Research on Deterrence and Incapacitative Effects was commissioned to examine the evidence regarding the crime reducing benefits of penal sanctions. They summarized their conclusions as follows: "..., we cannot yet assert that the evidence warrants an affirmative conclusion regarding deterrence" (Blumstein et al.:1978:7). While a negative association between crime rates and the risks of apprehension, conviction, and imprisonment is rather consistently observed<sup>2</sup>, Blumstein et al. were reluctant to attribute this to the deterrent effect of penal sanctions.

Within the deterrence tradition, additional police per capita are seen to increase the certainty of a response. Deterrence theories predict that an increase in police will lead to decreased rates of crime through the deterrent and/or incapacitative effects on both the specific offenders and the general population.

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<sup>2</sup> Blumstein et al.(1978) identify Forst (1976) as an exception. He did not find a significant inverse relationship between the index crime rate and either sanction measure. Nagin (Blumstein et al.:1978:106) states that this is "one of the most thorough analysis" and thus "the results should be carefully weighed against the others".

Police administrators and decision makers argue for additional police strength in response to increased rates of crime on the basis of such predictions. Ironically, cross-sectional studies of cities or states have found either no relationship between crime rates and police strength or a positive one whereby higher crime rates accompany higher per capita police strength. (See Wilson and Boland:1978; Blumstein et al:1978).

The postulate that more police are authorized in response to increased crime is embedded within some theories in the crime reduction - deterrent tradition. As indicated earlier, deterrence theories rest on the assumption that individual behaviour responds to incentives. Accordingly,

"...there is responsiveness to incentives on the part of both violators of the law and those who uphold and enforce it. Potential offenders on the whole are assumed to be deterred by the threat of punishment and encouraged by the prospect of differential illegitimate rewards. Potential victims, in turn, are assumed to respond to the threat of victimization by allocating resources both privately and collectively to minimize the net losses from crime" (Ehrlich and Mark:1977:303).

**In the aggregate, then, for deterrence theorists, increased crime rates are likely to result in increased levels of police strength (and law enforcement in general).**

Some scholars have specifically addressed the issue of simultaneity in their explanation of the relationship between law enforcement and crime rates. In such explanations, crime rates are influenced by sanction levels in addition to sanction levels affecting crime. The econometric model of deterrence, for example,

specifically allows for a two-way relationship between crime and police expenditure. As outlined by Becker (1968), Ehrlich (1973) and Ehrlich and Mark (1977), microeconomic theory sees crime rates and police resources as simultaneously determined. This theory predicts that as the crime rate rises, the amount of resources devoted to police will also rise. Conversely, however, it also predicts that as the amount of resources devoted to police rise, the crime rate will fall. Researchers in this tradition tend to operationally define resources devoted to law enforcement as expenditures on police. Although the focus of this thesis is on the volume or strength of police, the results of research examining the microeconomic deterrence theory are relevant to this thesis as the bulk of expenditures in law enforcement is for sworn police officers.<sup>3</sup>

Tests of the economic deterrence hypothesis have yielded mixed results. Using a two-stage least squares equations, Swimmer (1974) found empirical support for both hypotheses when looking at FBI data for 119 American cities in 1960. In other words, he found support to indicate that as the crime rate rises, the amount of resources devoted to police rise and that as the amount of resources devoted to police rise, the crime rate falls. Loftin and McDowall (1982) examined the relationship between the level of recorded crime and police strength (defined as the number of police per 100,000 residents) in Detroit, Michigan

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<sup>3</sup> For example, in 1988, salaries, wages and benefits accounted for 82% of all expenditures. (Ewins: 1990:21).

between 1926 and 1977. McDowall found no evidence to support either of these relationships.

Furthermore, the assumptions or identification restrictions used in simultaneous equation analyses of crime rates and law enforcement variables have been criticized and challenged. Blumstein et al. (1978), for example, point out that some studies have excluded socio-economic variables from the crime function. They question how such variables could influence sanctions such as police expenditures or arrest rates while not influencing the crime rate. Nevertheless, Blumstein et al. (1978) claim there is some evidence to support the crime reducing benefits of police if police resources are measured by annual expenditures on the police.

A major criticism of hypothesis inherent in the deterrent and microeconomic tradition is that they do not specify the temporal patterning of the relationship between police strength and crime rates. If policing has any deterrent effect on crime, is it to be seen immediately? Many theorists argue that the deterrent effects of policing will be seen in the crime rate over time. Some, such as Swimmer (1974) and Harris (1980), argue that one might expect an immediate increase in the number of crimes reported as more police are often brought about in response to a public outcry. However, over time the crime rate should stabilize. Swimmer (1974:295) asserts that "additional policemen lead to lower crime rates, but concurrently, increased crime rates lead to more policemen."

Some theories implicitly specify temporal delays by assuming that the impact of crime rates on police strength or expenditure is not instantaneous (for example, see Wellford [1974]). While some theories specify the lag structures and interdependence characterizing the relationship, for the most part, specification of the lag time at which these variables are expected to affect one another has been criticised. As pointed out by Loftin and McDowall (1982:394), "part of the problem with studies in the past is that the theory itself does not provide a clear indication of temporal patterning."

To the extent that simultaneity is an issue, however, the Panel on Research on Deterrent and Incapacitative Effects point out that the likelihood that sanctions and crime are simultaneously determined is probably greatest for imprisonment, less for conviction and least for arrest (Blumstein et al:1978:25-30). In other words, while simultaneity may be an issue when examining the deterrent effects of certain sanctions such as imprisonment, it is not likely to be important when looking at the relationship between police and reported rates of crime.

Koenig (1991:1-2) points out that when studies fail to find empirical support for the deterrence hypotheses, advocates "cast a critical eye" on the methodology. According to Loftin and McDowall (1982), one can find support for almost any general inference about the relationship between police and crime in the literature. Furthermore, they suggest that a preferable approach to clarifying the relationship between crime rates and police strength is to "study the

issues in a more inductive and exploratory fashion" (Loftin and McDowell:1982:394-395).

Some attempts have also been made to refine the definition of the relationship between crime rates and police as specified in the underlying theory. For example, Wilson and Boland (1978:81-82) argue that it is not only the number of police but more importantly the activity of police that has deterrent effects. They assert that police resources and police activity independently affect the crime rate after controlling for socio-economic factors.

Another suggestion has been that variations in police strength have an effect only up to a certain point or beyond a certain point. Certain types of crimes may be more prone to be deterred than others. For example, a study by Buck, Gross, Hakim and Weinblatt (1983) hypothesized that some crimes would be unaffected due to their high net returns. Thus, police are believed to be capable of deterring only marginal crimes. Buck et al. introduced the idea of a 'natural rate of crime' - "a level indigenous to a given type of community, about which little can be done." They argue that the number of crimes committed in the short run is affected not only by police strength and effectiveness, but also by socio-economic conditions like unemployment, percent of young males, and the turnover of the population. Based on the model they developed, they found support for the deterrent effect of police expenditures on all types of property crimes except robbery.

Deterrence based hypotheses have been criticised for failing to extend the rational picture of man, as pleasure seeking and self-serving, to the non-criminal population. Pepinski points out that if one assumes individuals are motivated to engage in particular behaviours when the potential rewards outweigh the potential losses, this assumption must extend to the non-criminal population as well as the criminal population. Pepinski (1976:120-121) specifically points out that law enforcement agents, such as the police, will also seek to optimize their actions. In Pepinski's words (1976:120-121):

"One lesson learned early in the study of patterns of rational response to criminal law is that the law cannot restrain administrators or a general populace from the pursuit of personal interest....The terms of criminal law provide ample areas of discretion for administrators to optimize their personal interests...It is in the interest of American administrators in a competitive society to take jurisdiction over cases and apply the law as often as they can....A smart police administrator, for instance, knows that the more the offences officially reported in his or her jurisdiction, the larger will be the departmental budget. The patrolman expects quite reasonably that the more arrests he or she makes, the greater will be his or her personal advancement. Hence administrators in their work tend to pursue personal interest by selling more of their services to the general populace. **Their success in this effort implies an ever increasing rate of officially recognized crime in the social system.**" [emphasis added]

Pepinski's observations clearly challenge the relationship between police strength and crime rates put forth by deterrence. Rather than assuming that the behaviour of law enforcement agents will be compatible with social optimization and minimization of the losses from crime, as those within the crime reduction

tradition would have us believe, Pepinski suggests that individual law enforcement agents will look out for their own best interests. **In the aggregate, this implies increasing crime rates in response to increased police strength.**

Pepinski is not alone in suggesting the relationship between law enforcement variables and crime is not necessarily as desired. On the contrary, the fundamental insight of the labelling perspective, as seen in the work of Tannebaum (1938) and Becker (1963), is the possible irony of social controllers creating what they set out to control. As Edwin Lemert puts it "social control leads to deviance" (Lemert:1967:V).

In Jason Ditton's articulation of a labelling perspective on criminal justice the position is clear. He asserts that the size of the 'dark figure' (i.e. the criminal population) is in principle infinite (Ditton:1979:21). He questions "How many crimes are there?" and answers "As many as you want (to react to)." He assumes what he refers to as an atheistic position which involves acceptance of the proposition that "the only real crime is the reaction rate" (Ditton:1979:21).

Alan Grant (1980:41-42) elaborates on this sort of argument:

"One could of course pursue this argument to a *reductio ad absurdum*, i.e. if we had no police to record crime our society would be 'officially' crime free. Yet the idea does contain a kernel of truth which should not be ignored by police policy-makers; that raw increases in police strength deployed in the same way as the dictates of the current deployment strategy require, is likely to be the least enterprising management solution since more of the same will be uncovered but the capability factor will remain constant."

The most interesting insight of theorists in the labelling tradition is that they alert us to the possibility that the police may influence crime but not necessarily in the desired direction. In addition, they emphasize "the dynamic and interdependent nature of the relation between the controller and the controlled" (Lemert:1967:18). Lemert argues that "social control must be taken as an independent variable rather than as a constant, or merely reciprocal societal reaction to deviance (Lemert:1967:18). Social control must also be considered as a cause of primary as well as secondary deviance.

The literature suggests many ways besides that suggested by Pepinski by which police may have a positive effect on levels of officially reported crime rates. For example, more police result in an increased capability of police to monitor and respond to public behaviour. This may result in an increase in the number of behaviours and people defined as criminal, thus increasing the overall crime rate. According to Koenig et al. (1983:317):

"Police activities may contribute to crimes, both intentionally and unintentionally, through the creation of a situation in which additional offences occur (e.g. perjury, obstructing justice), through nonenforcement of the law to cultivate informants or to regulate vice, and through compliance or encouragement of crime through entrapment, the use of decoys, etc.." (See also Gary T. Marx's article, "Ironies of Social Control", 1981.)

Pontell's (1978) notion of system capacity also challenges the relationship between law enforcement and criminal behaviour put forth by deterrence. Instead of focusing on the motivators for human behaviour, however, Pontell

addresses the limited capacity of the criminal justice system's components to respond to large increases in criminal offenders. The system capacity model is based on the assumption that:

"...part of the legal apparatus (courts and prisons), which generates and applies negative sanctions to criminals commands limited resources, and these resources do not increase proportionately to increases in the volume of work to be done. Thus the capacity of the legal system to administer negative sanctions is limited by the availability of resources" (Pontell:1978:9).

With fixed resources, large inputs of violators will tax the criminal justice system, decreasing its ability to administer negative sanctions. According to Pontell (1978:12-13):

"Amounts of crime may indeed affect the capacity of the judicial system to administer negative sanctions more than negative sanctions affect levels of crime. In particular, inverse relations between crime rates and the certainty of punishment may be due to the limited capacity of the criminal justice system to respond to large inputs of violators, rather than to the alleged deterrent effects of penal sanctions".

Thus to Pontell, it is irrelevant whether deterrence works in theory for in practice it does not and cannot. According to Pontell, however, "(when)as the criminal justice system grows, so does the crime problem" (Pontell:1984:1). **If crime rates are determined largely by organizational resources, then if we increase the number of police, the crime rate will increase.**

Koenig's (1991) research, which this study replicates, is an examination of the hypothesis embedded in this theory. Using correlational analysis, Koenig

explores the relationship between per capita police strength and Canadian crime rates for the period from 1962 to 1988 to determine whether increased crime rates precede, occur concurrently, or follow increased levels of police strength.

According to Koenig (1991:iii):

"The pattern of findings suggests a tendency for increased police strength to precede increased crime rates, rather than being a response to increased crime rates. The 310 percent increase in police reported rates of violent crime between 1962 and 1988 are an exception to this generalization. Lower levels of per capita police strength are associated with higher subsequent rates of violent crime."

Koenig (1991:iii) argues that "increased levels of violence provide the rationale for increased levels of police strength, but that these increased levels of police strength merely generate increased police activity, which has not necessarily been well targeted at containing violent crime." This thesis replicates his approach using the ten Canadian provinces as the unit of analysis to determine if a similar pattern of findings will hold.

In summary, there are numerous perspectives on the relationship between police and crime rates. To test the merits of the hypothesis inherent in the various perspectives would require different methods and data as the basic research questions differ. Deterrence focuses upon "actual" crime believing that increased police strength will be followed by decreased rates of "actual" crime. While some deterrence hypotheses predict that increased police (measured by strength, expenditures and/or activity) will have a negative impact upon

subsequent crime rates, others have suggested that more police will be authorized in response to an increased rate of crime, and then the deterrent effect of police will be seen.

It has long been known that official crime rates underestimate the amount of crime in society (Statistics Canada:1992E:2). Clarke and Hough (1984) have criticised attempts to assess the effectiveness of police in combatting crime by focusing on changes in reported rates of various offences. Victimization rates are believed to provide better indicators of "actual" rates of crime. To assess the merits of deterrence hypothesis in terms of the crime reducing benefits of increased police strength would require longitudinal victimization data. Presently, such longitudinal Canadian victimization data are unavailable.

In contrast to the deterrence hypotheses, Pontell's system capacity hypothesis, focuses on reported rates of crime. According to this perspective, increased police strength will be associated with increased police activity and hence increased rates of reported crime. It is this thesis that is being examined here. The focus then is on reported crime rates as indicators of police activity rather than as reflections of increases or decreases in levels of "actual" crime.

Reported rates of crime provide an appropriate testing ground for the ideas embedded in a system capacity approach to policing. In this thesis, the focus is on how police strength affects reporting rates. If increased police strength precedes increased rates of reported crime, and officially reported rates of crime

are used to make decisions surrounding the allocation of police manpower, the inherent danger is that of spiralling rates of reported crime and of public expenditures bereft of public benefit. Koenig's findings (1991) and some of the literature outlined in the previous pages suggest that this is a possibility. The purpose of this thesis is to explore the relationship between police strength per capita and officially reported rates of crime.

### Chapter 3 - Methodology

This thesis explores the relationship between police strength and crime rates to determine whether increased crime rates precede, follow, or occur concurrently with increased police strength. The current research is a replication of the approach taken by Koenig (1991) in his study Do the Police Cause Crime? Police Activity, Police Strength and Crime Rates. Using correlational analysis, Koenig (1991) explored the relationship between Canadian crime rates and per capita police strength for the period 1962 to 1988. Koenig found a tendency for increased police strength to precede increased crime rates for the 27-year period, rather than being a response to increased crime rates. The trend in violent crime did not fit this generalization, however, with lower levels of per capita police strength associated with higher subsequent rates of violent crime. Koenig (1991:iii) argues that "increased levels of [reported] violence provide the rationale for increased levels of police strength, but that these increased levels of police strength merely generate increased police activity, which has not necessarily been well targeted at containing violent crime."

A limitation of the Koenig study was the level of aggregated data used. Koenig (1991:30) asserts that "One would have greater confidence in the findings if each province or each municipal police department had been analyzed and a reasonably consistent pattern at the level of individual departments, or at least the

level of provinces, were found." This research responds to that request. In this study, individual provinces are the units of analysis.

The questions raised by Koenig's analysis which this thesis will address are:

- 1) Do increased levels of police strength precede increases in the reported rates of various crimes (robbery, break and enter, all property crimes, criminal code offences, and total offences)? and
- 2) Do rates of violent crime have a dynamic of their own whereby higher levels of police strength are associated with subsequent rates of violence lower than they otherwise would have been?

Despite methodological limitations with Koenig's analysis<sup>4</sup>, it is worthwhile replicating the approach to demonstrate that the findings are not mere coincidence or a reflection of the unit of data explored. If the pattern of results at the provincial level is consistent with the pattern of findings observed for Canada as a whole, this thesis will lend further support to Koenig's conclusions.

The current research is based on time series data for the ten Canadian provinces covering the period 1962 to 1988. In this study, sworn police strength is correlated with selected crime rates to explore whether a systematic relationship exists at the provincial level between per capita police strength and crime rates.

Police strength is operationally defined as the number of full-time police

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<sup>4</sup> Methodological limitations identified by Koenig himself include: 1) the use of aggregated data utilized allows us to say nothing about the relationship at the individual level. The study could be accused of an ecological fallacy; and 2) the measure of police strength refers to full time sworn police officers not working hours; thus the relationship may be blurred or affected by changes in working conditions over time.

officers (employed as of December 31 annually) per capita. Police data was extracted from the microcomputer data base, *Relative Trends* (updated as of February 1, 1990). The source of this data is the annual police administration survey conducted by Statistics Canada Canadian Centre for Justice Statistics.<sup>5</sup>

As in the analysis by Koenig, six measures<sup>6</sup> of the crime rate are used<sup>7</sup>:

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<sup>5</sup> The Annual Police Administration Survey was implemented in 1961. The survey instrument was revised in 1986. The definition of full-time sworn police changed between the two versions of the survey instrument. As a result, it was necessary to use an adjustment factor to make the 1986 through 1988 data consistent with the previous data. The adjustment factor was derived by determining the ratio of full-time police in 1986, the common year, found in the 1986 instrument reported by the previous measure relative to those found in the revised measure as reported in Statistics Canada CCJS (1988) *Juristat* (August) on page 10 and in footnotes 3 and 4 to table one. The ratio was 1.061818. The number of full-time sworn police for each province as reported in the 1988 version was multiplied by this ratio making the two sets of data comparable and consistent. For each province, the resulting number of police were then computed per 1,000 population for each year from 1962 through 1988. This was the method used by Koenig (1991) and thus makes these data consistent with his.

The major factors accounting for the differences in full-time sworn police between the two survey instruments is that the newer instrument excludes CN, CP, and Ports Canada police forces. As well, special constables have been moved to the category of "other personnel".

<sup>6</sup> These categories are **not** mutually exclusive. Total violent crimes includes robbery as well as other violent offenses; total property includes break and enter as well as other property offenses; total Criminal Code offenses includes all of the preceding, as well as additional criminal offenses; total offenses include all Criminal Code offenses, as well as additional statutory offenses.

<sup>7</sup> Documentation provided with the *Relative Trends* data base provides the following parameters for each of the crime rates used in this study:

#### Robbery

"Everyone commits robbery who assaults, wounds, maims, beats, strikes, etc. or otherwise uses violence or threat of violence to property or persons, or is armed with an offensive weapon or imitation, while stealing or extorting to steal. Includes stopping the mail (s.304). This category gives aggregates of the detailed UCR listings for robbery with firearms, with weapons and without weapons (see s.302), which have been available since 1974."

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### Violent Index Offenses

"The Criminal Code defines a number of crimes as (Part VI) "Offenses Against the Person" and (Part VII) "Offenses Against Rights of Property". The UCR report traditionally has tried to reflect this classification by classifying its offenses under three broad headings: i) "violent", ii) "property", and iii) "other CC". The UCR-Violent Index broadly incorporates the more serious and frequent of these "Part VI" offenses (but not all). It includes, for example, "robbery" and "extortion" (which are Part VII "property" offenses in the CC, but which are traditionally moved to the violent classification in UCR). The violent-index for UCR includes homicide (including murder and manslaughter), infanticide, attempted murders, assaults (sexual and non-sexual), other sexual (non-assault) offenses, abductions (excluding kidnappings, which are classified under "Other CC", and robberies."

### Break and Enter

Break and enter includes "with intent", "committing", and "breaking out" (see s.306.1(a) (b) and (c)). For definitions of "break", "entrance" and "place" see s.282 (a)(b); 308 (a)(b); and 306.4. Since 1974, UCR data on B7E is available separately for "business premise", "residence" and "other" (see s. 306.1 (b) and (d), for definitions of "premise" and "residence"; business premise relates to the municipal tax assessment while residence for the most part equates with "dwelling house"). For multiple premises or residences, UCR scores one offense for each hotel/motel room, each office or warehouse occupied by a separate firm, and each apartment or suite when used as a distinct household.

### Property-Index Offenses

"The Criminal Code defines a number of crimes as (Part VI) "Offenses Against the Person" and (Part VII) "Offenses Against Rights of Property". The UCR report traditionally has tried to reflect this classification, by combining offenses under three broad headings: i) "violent", ii) "property", and iii) "other CC". The UCR-Property Index incorporates the more serious and more frequent of the "Part VII" property offenses but not all, it excludes "robbery" and "extortion", which are actually classified in the CC as Part VII offenses). In the UCR survey, the "property index" includes the following criminal code offenses: breaking and entering, theft of motor vehicle, theft over and under (\$50/\$200/\$10000, having stolen goods, and frauds. Although this "index" is not fully inclusive of all UCR property offenses, these offenses have been used in the UCR since 1962 as the property offense index."

### Criminal Code-Total

"Includes all Criminal Code offenses recorded in the annual UCR survey, except for Criminal Code "Traffic" offenses (all s.233-s.239 offenses, such as dangerous driving, undue care or control, failure to stop, over .08, impaired driving, etc. as well as the s.202-s.204 criminal negligence offenses that occur when a vehicle is involved) which are reported in a separate Traffic survey."

- 1) robbery;
- 2) all violent crimes;
- 3) break and enter;
- 4) all property crimes;
- 5) criminal code offences; and
- 6) total offences.

All crime rates are derived from the actual number of founded crimes as reported by Statistics Canada 1962 through 1988. The crime data were extracted from Statistics Canada CCJS's (1990C) microcomputer database, *Relative Trends*. As indicated in the literature review, police strength may be viewed not only as a societal response to crime, or a dependent variable, but also as an independent variable. The literature discussed earlier suggests that the relationship between crime rates and police strength is not necessarily as desired and that both forms of the relationship are tenable. Therefore, in this study, as in the analysis upon which it is based, the police strength and selected crime rates alternatively occupy the role of dependent and independent variable.

Previous research has indicated that crime rates vary with the demographics of the population upon which they are based. Specifically, crime rates vary with variations in the age and sex structure of the population. Males have historically been disproportionately represented in criminal justice statistics.

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All Offences (Excluding Traffic)

"Total includes all Criminal Code, Federal Statute, Provincial Statutes, and Municipal By-Law offenses, excluding traffic offenses."

In 1991, for example, males represented 83% of individuals charged with Criminal Code offences; almost 90% of individuals charged with violent offences and approximately 80% of individuals charged with property offences (Statistics Canada:1992D:11-12). Youth have also been disproportionately represented in criminal justice statistics. For example, in 1991, youth represented only 8% of the population but accounted for 23% of all individuals charged with criminal offences. (Statistics Canada:1992D:13) Hartnagel and Lee (1990) reported that young males have consistently been shown to be more active in criminal activities than any other groups. Controls are introduced for both the age and sex structure of the population.<sup>8</sup> Each of the six crime variables therefore is expressed as annual rates per 1,000 total male population<sup>9</sup>, per 1,000 male population 18-34

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<sup>8</sup> Blumstein et al. (1978) alert us to a potential bias in studies examining the natural variation in crime rates and sanction levels. In all analyses of natural variation we lack control over the process. Thus, the negative association which has been found between crimes and sanctions could be caused by some other common variable which influences crimes and sanctions in opposite directions. Statistical procedures exist which allow us to control for the effects of such potential third causes and thus to eliminate the possibility of spurious results. In the area of study, controls for socioeconomic and demographic differences among the populations in the units of observation are important as they represent variables which correlate with crime. As no demonstrable theory of crime causation exists, Blumstein et al. (1978:23) caution us that the possibility of a still unknown third variable continues to exist, and is particularly pronounced when performing statistical analysis of nonexperimental data.

<sup>9</sup> Both the total population data and the data for the population 18-34 years were extracted from version 2 of *Relative Trends*, as revised with corrected data in February, 1990. These figures were discrepant from the final post census estimates from 1981 forward. Koenig (1991) indicates that the data from version 2 uses the same definition of population consistently: Koenig speculates that version 1 "may have used estimates adjusted for incomplete enumeration of Indian Reserves and settlements up to 1981, and actual counts thereafter, while Version 2 may have used actual population counts for the entire population from 1962 through 1986, with estimates for 1987 and 1988. The population data in every case has been rounded to the nearest thousand.

years, and per 1,000 male population 15-24 years<sup>10</sup>. This leads to the construction of eighteen crime variables. While these controls are crude, they make the data consistent with the analysis upon which it is based.

Additional controls are introduced for unemployment rate<sup>11</sup>, consumer price index<sup>12</sup> and a time trend variable, "year." The literature linking

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<sup>10</sup> Population data on those 15 through 24 years of age was extracted from Version 1 of Statistics Canada CCJS's (1990C) *Relative Trends* data base for the years 1962 through 1981. From 1982 onwards, the final post census estimates were used. They were extracted from Statistics Canada's (1988B) Catalog 91-518 (Tables 1 to 6) for the years 1982 to 1986 and Statistics Canada (1988C) Catalog 91-210 for 1987 and 1988.

<sup>11</sup> The unadjusted monthly average unemployment rate for both sexes 15 years and over was used. All data was extracted from Catalog 71-201. Data from 1962 through 1965 were taken from Statistics Canada 1974 (1975) *Historical Labour Force Statistics* (Catalog 71-201 Series D491-497 4-1101-5240; pages 256-260). For Manitoba, Saskatchewan and Alberta, the Prairie total was used; and for Nova Scotia, New Brunswick, Newfoundland, and Prince Edward Island, the Atlantic total was used. The data was reported on a monthly basis, therefore the figures used here were first added for a year and then divided by 12.

Data for 1966 through 1988 were extracted from Statistics Canada (1989) Catalog 71-201 pages 219-249. The available data on Prince Edward Island were sketchy. The unadjusted monthly average for Prince Edward Island was used for years 1972 and 1975 through 1988, as reported by Statistics Canada (1989) Catalog 71-201 (p.220) while the figure for the Atlantic region served as a proxy for the years 1962 through 1971 and 1973 through 1974. These figures were extracted from Statistics Canada (1974) *Historical Labour Force Statistics Catalog 71-201 Series D491-497* (p.256).

<sup>12</sup> Consumer price index (CPI) data used 1981 as a base of 100 and were annual averages unadjusted for seasonal variation. As the consumer price index is unavailable in most cases on a provincial basis, the CPI utilized here is based on the largest city in each province.

With the exception of Prince Edward Island, CPI data for 1961 through 1972 were extracted from Series K23-32 *Historical Statistics of Canada* which were reported on a base of 1971=100. Each was converted to a 1981 base value using the following steps: a) 1981 value divided by 1971 value for a common year equals 'x'; and b) all other 1971 values were multiplied by 'x' to determine their value using 1981 as a base of 100.

The CPI for Charlottetown, Prince Edward Island was unavailable for the years 1962 through 1973. Fredericton, New Brunswick's CPI was chosen to serve as a proxy for Prince Edward Island CPI during these missing years. The choice of proxy was made on the basis of the similarity in CPI

unemployment to crime rates goes back for over a century.<sup>13</sup> (A review of this literature is also offered by Grainger [1980]). Devine et al. (1988:407) argue for the inclusion of both unemployment and inflation rates as indicators of the overall health of the economy. They argue that economic distress increases the probability of higher crime rates while limiting the government's capacity to maintain control. Koenig's rationale for the inclusion of these variables is that "influential researchers such as Brenner (1976) have claimed that crime rates appear to be correlated with unemployment rates and inflation, among other

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between Fredericton and Charlottetown during the following years. These figures were extracted from Series K23-32 *Historical Statistics of Canada*.

Figures for 1973 through 1987 for all provinces were taken from Table 10 of Statistics Canada's (1990) Catalog 62-010.

CPI data for 1988 for Ontario, Manitoba, Saskatchewan, Alberta and British Columbia are from Table 8 of Statistics Canada (1990) Catalog K33-43. Data for 1988 for all the remaining provinces was provided by the Planning and Statistics Division, Ministry of Finance and Corporate Affairs, Province of B.C., using 1986 as a base of 100 and converting to 1981 as a base of 100.

<sup>13</sup> In *Economic Crisis and Crime*, Brenner (1976:17) offers the following summary of research:

"From the existing literature, it is impossible to deduce any definitive conclusion regarding economic crisis and crime. The general impression seems to be that since the 1950s the crime rate has shown a steady increase regardless of changes in the economic situation. Even if some studies have shown a correlation between certain economic indicators and certain types of crime, most studies have not been able to establish any correlation. In the studies where positive correlations are found, however, these correlations often disappear when the data are reanalysed with other methods or if other variables are incorporated in the analysis. And similar studies from other countries or studies using different time periods often give different results.

The reason why it has been impossible to establish any relationship between crime and the economic situation may of course be due to the fact that no such relationships exist. However, the explanation could also be that the data in question or the analytical methods employed have been unsuitable for disclosing a relationship."

phenomena" (Koenig:1991:52). The present study does not speculate on the nature of the relationship, if any, between crime rates and either unemployment, inflation or time. However, as it is possible that they do influence either the crime rate, police strength or both, it is desirable to hold constant their influence. Therefore, statistical controls are introduced.

The analysis for this study consists of constructing zero and third order product moment correlation coefficients for both forms of the relationship with the various operationalizations of both crime rates and police strength. The third order correlations control simultaneously for unemployment, consumer price index and time. This allows a statistical elimination of any effect of these variables on the relationship between police strength and crime rates. As much of the literature has suggested that the impact of police on crime rates or crime rates on police strength per capita should not be expected to be immediate, lags are introduced to both forms of the relationship and correlation coefficients recomputed. In order to be consistent with Koenig's analysis, lags of one, three and five years are used.<sup>14</sup>

In summary, data from the ten Canadian provinces is used to determine whether the tendency for increased police strength to precede increased rates of

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<sup>14</sup> Koenig (1991:54) states that lags of 1, 3 and 5 years "were arbitrarily selected to provide a range of tests, without unnecessarily cluttering the tabular presentation of the data. There is no reason to believe that the results would have differed in any substantive way had the data instead been lagged 2, 4, and 6 years."

reported crime, which Koenig (1991) found using national level data, will hold. In discussions surrounding the allocation of resources, police administrators often seek to authorize more police in response to the burgeoning crime rates that appear in their statistics. Koenig's study suggests that increased police strength precedes increases in subsequent reported rates of selected crimes. His findings suggest that authorizing additional police in response to increased crime rates is counterproductive if the desire is to lower rates of reported crime. Increases in police strength will simply lead to higher, not lower rates of reported crime.

The data used to test this idea spans the same twenty-seven-year period Koenig used. The crime data used in this thesis are officially reported rates. They are not measures of actual crime. It has been argued that of real crimes there is no measure (Ditton:1979:17).

The six crimes used in this study are robbery, all violent crimes, break and enter, all property crimes, criminal code offences, and total offences. The crime rates are expressed as rates per 1,000 population males, per 1,000 population males 18-34 and per 1,000 population males 15-24 years resulting in the operationalization of eighteen crime variable.<sup>15</sup> As males are disproportionately represented in criminal justice statistics, expressing each crime rate per 1,000 population male serves to control for gender variations in criminal activities.

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<sup>15</sup> The eighteen crime variables utilized here are statistical constructs. They do not represent the actual ages of those who committed crimes during the 27 year period under study.

Furthermore, as young males between the ages of 15 through 35 are most heavily represented in criminal justice statistics, expressing each crime rate per 1,000 population males of various ages serves to control for age and gender simultaneously. Although the impact of economic factors such as unemployment and inflation is unclear, controls for these variables will eliminate any effect that they may have upon the main relationship being investigated, that of the interplay between police strength and rates of reported crime. The introduction of a time trend variable serves to eliminate the possibility of spurious results caused by some other unknown factor which may be influencing the relationship between crime rates and police strength over time.

This section has presented the methodology used to explore the relationship between selected crime rates and police strength per capita over the twenty-seven-year period spanning 1962 through 1988 for the ten Canadian provinces. In the following section, the results are presented.

## Chapter 4 - Analysis

### Zero-Order Correlation Coefficients of Police Strength and Crime Rates

Table 1 displays the zero order product correlation coefficients (Pearson's  $r$ ) for police with each of the 18 constructed crime variables. With a few exceptions, in all provinces there is a statistically significant positive relationship of police strength per capita with each of the six rates of crime - whether crime rates are expressed per 1,000 total males, per 1,000 males ages 18 through 34, or per 1,000 males ages 15 through 24. This is consistent with the pattern for Canada as a whole. The only non-significant correlations are for police strength with robbery rates in each of the population age groupings in Prince Edward Island. The deviation of Prince Edward Island from the overall pattern is not surprising as the number of robberies recorded annually in this province is minimal. The number of robberies in Prince Edward Island ranged from 3 to 25 with an average of 13.5 for the 27 years under study here.

### Third Order Partial Coefficients of Police Strength with Crime Rates

In order to eliminate the effect of extraneous variables upon the relationship between police strength and reported rates of crime controls are introduced. Table 2 presents the third order partial correlation coefficients of police strength with each of the 18 constructed crime variables with controls

introduced for unemployment rate, consumer price index, and a time variable. With the exception of robbery rates in Prince Edward Island, the third order coefficients in Table 2 are consistently lower than their zero order uncontrolled counterparts in Table 1. Many of the relationships disappear when controls are introduced. Only forty-six of the 180 coefficients for the provinces reach significance compared to 177 in Table 1. The number of statistically significant coefficients per province varies from a low of 0 in Prince Edward Island to a high of 10 in Nova Scotia. Coefficients which remain significant are less strong than their uncontrolled counterparts. It is clear that some of the relationship between police strength and crime rates is attributable to the unemployment rate, the consumer price index, or some other factor(s) being tapped by the time variable.

For Canada as a whole, only the coefficients of police strength with rates for robbery and total criminal code offences remain statistically significant across all three age ranges. None of the third order coefficients for the 18 constructed crime variables are significant across the ten provinces. The most frequent relationships to reach significance are those involving police strength and criminal code offences for all males and total offences for males 15-24. These are positive and statistically significant in five provinces (British Columbia, Saskatchewan, Ontario, New Brunswick, Nova Scotia).

Consistent with Koenig's analysis of the national level data, the coefficients involving violent crimes deviate from the overall pattern of positive coefficients.

While not necessarily statistically significant, the coefficients involving violent crimes tend to be negative. These negative coefficients are significant in only three provinces. In Newfoundland and Manitoba, these negative coefficients are significant for all three population groupings, and in British Columbia they are significant for males 18-34 and for males 15-24. The only exception to this pattern of negative coefficients occurs in Quebec across all three population age groups, and in Alberta, Saskatchewan, and Nova Scotia when violent crimes are expressed per 1,000 males.

**Table 1**  
**Crime rates with police strength per 1,000 total population: Unlagged zero order correlation coefficients<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.9288***	.9197***	.9500***	.9542***	.8792***	.9605***	.7928***	.9524***	.9658***	.9009***	.9603***
Criminal Code	.9088***	.9597***	.9192***	.8449***	.8591***	.9602***	.7613***	.9316***	.9722***	.8500***	.9345***
<b>Violent</b>	<b>.8744***</b>	<b>.9055***</b>	<b>.9400***</b>	<b>.8871***</b>	<b>.7500***</b>	<b>.9070***</b>	<b>.7494***</b>	<b>.8501***</b>	<b>.9465***</b>	<b>.7592***</b>	<b>.9340***</b>
Robbery	.9275***	.8899***	.9314***	.8233***	.8428***	.9559***	.7904***	.9073***	.8577***	.0347	.6807***
Property	.9099***	.9498***	.9152***	.8382***	.8583***	.9480***	.7590***	.9470***	.9660***	.8326***	.8651***
Break and Enter	.9052***	.9448***	.9286***	.7904***	.8071***	.9309***	.7753***	.9278***	.9508***	.8375***	.8658***
<b>Males 18-34</b>											
Total Offences	.9265***	.7425***	.8514***	.9785***	.8331***	.9551***	.7694***	.9003***	.9459***	.8492***	.8925***
Criminal Code	.9068***	.9226***	.8427***	.8726***	.8328***	.9616***	.7413***	.9137***	.9711***	.8559***	.8600***
<b>Violent</b>	<b>.8227***</b>	<b>.7949***</b>	<b>.7136***</b>	<b>.8097***</b>	<b>.7083***</b>	<b>.8448***</b>	<b>.7061***</b>	<b>.7264***</b>	<b>.8344***</b>	<b>.7078***</b>	<b>.8790***</b>
Robbery	.9374***	.8382***	.8771***	.8395***	.8136***	.9579***	.7839***	.8665***	.7862***	-.1958	.5311**
Property	.9097***	.9069***	.8328***	.8640***	.8224***	.9410***	.7427***	.9342***	.9633***	.8149***	.7209***
Break and Enter	.9087***	.8986***	.9084***	.8056***	.7438***	.9178***	.7729***	.8966***	.9264***	.8243***	.7321***
<b>Males 15-24</b>											
Total Offences	.8167***	.7852***	.8278***	.9073***	.7921***	.9097***	.6442***	.9065***	.9687***	.8423***	.9442***
Criminal Code	.8092***	.9096***	.7208***	.7506***	.7872***	.9165***	.6333***	.8967***	.9525***	.8094***	.9100***
<b>Violent</b>	<b>.7345***</b>	<b>.8107***</b>	<b>.7227***</b>	<b>.7685***</b>	<b>.6774***</b>	<b>.8028***</b>	<b>.5896**</b>	<b>.7777***</b>	<b>.8754***</b>	<b>.6838***</b>	<b>.9303***</b>
Robbery	.8817***	.8801***	.8917***	.7652***	.7862***	.9193***	.7275***	.8745***	.8699***	-.0804	.6091***
Property	.8168***	.9066***	.7359***	.7539***	.7831***	.9124***	.6428***	.9173***	.9450***	.7818***	.8097***
Break and Enter	.8243***	.9004***	.8223***	.7080***	.7150***	.8905***	.6860***	.8967***	.9512***	.8035***	.7877***

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000.

**Table 2**

**Crime rates with police strength per 1,000 total population: Unlagged third order correlation coefficients<sup>1</sup> controlling for the provincial unemployment rate, the provincial consumer price index, and a time trend variable "year".**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.5677**	-.0016	.4412*	.5640**	.3686	.3070	.3834	.6351***	.7102***	.2517	.1933
Criminal Code	.6286***	.4399*	.2935	.5984**	.2727	.4094*	.3760	.6050**	.6692***	.3973	.1923
<b>Violent</b>	<b>-.0323</b>	<b>-.3086</b>	<b>.2457</b>	<b>.0798</b>	<b>-.7043***</b>	<b>-.1074</b>	<b>.4004</b>	<b>-.1833</b>	<b>.2248</b>	<b>-.2831</b>	<b>-.5707**</b>
Robbery	.7952***	.2303	.4414*	.3160	-.1885	.6420***	.4959*	.3438	.5939**	-.2594	.2097
Property	.4950*	.2889	.2718	.4329	.2282	.1706	.4176*	.5366**	.4824*	.3457	.1684
Break and Enter	.5051*	.2747	.3934	.1253	.1324	.1073	.3945	.2869	.3617	.2658	.1945
<b>Males 18-34</b>											
Total Offences	.3548	-.5394**	.1788	.5585**	-.0254	.1691	.3064	.4741*	.7003***	-.1577	-.0449
Criminal Code	.4414*	-.3007	.0136	.3023	-.0956	.3067	.3187	.5027*	.6323***	.2502	.0291
<b>Violent</b>	<b>-.2961</b>	<b>-.5811**</b>	<b>-.0207</b>	<b>-.0108</b>	<b>-.7924***</b>	<b>-.2362</b>	<b>.2559</b>	<b>-.2826</b>	<b>-.0029</b>	<b>-.3875</b>	<b>-.5909**</b>
Robbery	.7972***	.0141	.3416	.2646	-.3359	.5391**	.4901*	.2682	.5724**	-.2865	.1479
Property	.2780	-.2929	.0226	.1724	-.0769	.0199	.3920	.4527*	.3849	.2341	.0333
Break and Enter	.3771	-.2028	.2088	-.0241	-.0789	-.0275	.3755	.1967	.2716	.1783	.0834
<b>Males 15-24</b>											
Total Offences	.4476*	-.4591*	-.1214	.4753*	.0016	.4186*	.2804	.6005**	.7098***	.1462	.2312
Criminal Code	.4263*	-.0762	-.1629	.1832	-.1506	.5208**	.2860	.5921**	.6191***	.3641	.2151
<b>Violent</b>	<b>-.2476</b>	<b>-.5363**</b>	<b>-.1858</b>	<b>-.0692</b>	<b>-.7394***</b>	<b>-.0509</b>	<b>.1194</b>	<b>-.2386</b>	<b>-.0605</b>	<b>-.3155</b>	<b>-.5260**</b>
Robbery	.8234***	.0870	.2377	.1989	-.3786	.6337***	.4781*	.3113	.5782**	-.2600	.2106
Property	.2915	-.1262	-.1361	.1082	-.0857	.2216	.3766	.5292**	.3402	.3242	.1860
Break and Enter	.3935	-.0618	.0065	-.1084	-.1028	.1383	.3634	.2563	.2501	.2385	.2094

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000 population.

### Correlations of Crime Rates with Subsequent Police Strength

In order to examine temporal association, each of the crime rates examined here is lagged and correlated with subsequent police strength. Tables 3 through 5 report the correlations of police strength with crime rates one, three and five years earlier. When the crime rates are lagged one year (Table 3), the correlation coefficients between each of the crime rates and subsequent police strength is statistically significant and positive in all provinces with the exception of robbery rates in Prince Edward Island.

When the crime rates are lagged three years (Table 4), the coefficients remain statistically significant and positive in all provinces, again with the exception of robbery rates in Prince Edward Island. The pattern of significance for the province of Quebec differs slightly from the other provinces, with only three of the eighteen coefficients reaching significance at the .001 level (violent offences for all males; violent offences for males 18-34; and total offences for males 18-34).

Excluding robbery rates in Prince Edward Island, when the crime rates are lagged five years (Table 5), Quebec provides the only deviation from this pattern of statistically significant positive associations. For the Quebec data, while all coefficients are positive, consistent with the other province, only three of the correlations are significant: violent offences for all males; total offences for males 18-34; and violent offences for males 18-34.

**Table 3**  
**Full time police strength per 1,000 population with crime rates lagged one year<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.9022***	.8978***	.9214***	.9264***	.8346***	.9487***	.7424***	.9384***	.9681***	.8877***	.9570***
Criminal Code	.8820***	.9461***	.8936***	.8166***	.8159***	.9426***	.7086***	.9103***	.9658***	.8100***	.9405***
<b>Violent</b>	<b>.8811***</b>	<b>.8857***</b>	<b>.9426***</b>	<b>.8843***</b>	<b>.7343***</b>	<b>.9241***</b>	<b>.7373***</b>	<b>.8493***</b>	<b>.9481***</b>	<b>.7784***</b>	<b>.9502***</b>
Robbery	.8887***	.8720***	.9016***	.7857***	.8403***	.9322***	.7221***	.8940***	.8479***	.0560	.7372***
Property	.8791***	.9394***	.8822***	.8094***	.8102***	.9283***	.6962***	.9269***	.9618***	.7736***	.9005***
Break and Enter	.8700***	.9367***	.8919***	.7568***	.7473***	.9015***	.7106***	.9147***	.9690***	.8144***	.9098***
<b>Males 18-34</b>											
Total Offences	.9129***	.7024***	.8539***	.9661***	.7866***	.9498***	.7324***	.8920***	.9513***	.8689***	.8884***
Criminal Code	.8919***	.9126***	.8522***	.8602***	.7899***	.9485***	.6999***	.8970***	.9653***	.8255***	.8714***
<b>Violent</b>	<b>.8543***</b>	<b>.7728***</b>	<b>.7451***</b>	<b>.8246***</b>	<b>.6984***</b>	<b>.8748***</b>	<b>.7202***</b>	<b>.7280***</b>	<b>.8327***</b>	<b>.7520***</b>	<b>.8997***</b>
Robbery	.9040***	.8175***	.8676***	.8105***	.8197***	.9384***	.7197***	.8599***	.7788***	-.1585	.6021***
Property	.8880***	.8956***	.8227***	.8500***	.7728***	.9244***	.6868***	.9177***	.9596***	.7714***	.7845***
Break and Enter	.8801***	.8878***	.8881***	.7823***	.6768***	.8878***	.7148***	.8890***	.9495***	.8175***	.8108***
<b>Males 15-24</b>											
Total Offences	.7993***	.7462***	.8480***	.8847***	.7389***	.9042***	.6100***	.8875***	.9647***	.8336***	.9425***
Criminal Code	.7922***	.8933***	.7352***	.7253***	.7397***	.9056***	.5955***	.8730***	.9463***	.7724***	.9215***
<b>Violent</b>	<b>.7560***</b>	<b>.7888***</b>	<b>.7684***</b>	<b>.7747***</b>	<b>.6614***</b>	<b>.8407***</b>	<b>.6001***</b>	<b>.7744***</b>	<b>.8891***</b>	<b>.7140***</b>	<b>.9469***</b>
Robbery	.8466***	.8512***	.8690***	.7274***	.7894***	.9054***	.6636***	.8531***	.8470***	-.0710	.6735***
Property	.7916***	.8874***	.7346***	.7272***	.7282***	.8913***	.5910***	.8920***	.9403***	.7296***	.8614***
Break and Enter	.7927***	.8798***	.8133***	.6748***	.6487***	.8556***	.6316***	.8740***	.9667***	.7736***	.8487***

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000 population.

**Table 4**  
**Full time police strength per 1,000 population with crime rates lagged three years.<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.8244***	.8953***	.8509***	.8452***	.7579***	.8854***	.5987**	.8796***	.9143***	.8262***	.9613***
Criminal Code	.8072***	.9408***	.8385***	.7626***	.7542***	.8783***	.5576**	.8392***	.9192***	.7041***	.9618***
<b>Violent</b>	<b>.8773***</b>	<b>.8992***</b>	<b>.8969***</b>	<b>.8825***</b>	<b>.7194***</b>	<b>.9494***</b>	<b>.6407***</b>	<b>.8461***</b>	<b>.9327***</b>	<b>.7738***</b>	<b>.9542***</b>
Robbery	.7768***	.9012***	.8293***	.7491***	.7907***	.8599***	.4995*	.8041***	.8992***	.0124	.8158***
Property	.8027***	.9446***	.8375***	.7601***	.7410***	.8686***	.5207**	.8534***	.9247***	.6721***	.9505***
Break and Enter	.7827***	.9340***	.8211***	.7143***	.6807***	.8366***	.5253**	.8548***	.9479***	.7063***	.9503***
<b>Males 18-34</b>											
Total Offences	.8614***	.7193***	.8348***	.8999***	.7180***	.8947***	.6209***	.8369***	.8897***	.8830***	.8946***
Criminal Code	.8417***	.9340***	.8548***	.8376***	.7433***	.8924***	.5738**	.8307***	.9148***	.7411***	.9069***
<b>Violent</b>	<b>.9109***</b>	<b>.8226***</b>	<b>.7288***</b>	<b>.8433***</b>	<b>.7011***</b>	<b>.9394***</b>	<b>.6768***</b>	<b>.7315***</b>	<b>.8008***</b>	<b>.7966***</b>	<b>.9021***</b>
Robbery	.7988***	.8618***	.8314***	.7981***	.7866***	.8722***	.4988*	.7622***	.8675***	-.1629	.7081***
Property	.8339***	.9261***	.8414***	.8338***	.7165***	.8747***	.5254**	.8470***	.9224***	.6947***	.8739***
Break and Enter	.8092***	.9080***	.8593***	.7733***	.6149**	.8294***	.5410**	.8347***	.9337***	.7308***	.8897***
<b>Males 15-24</b>											
Total Offences	.7458***	.7120***	.8542***	.8145***	.6573***	.8904***	.5020*	.8196***	.8944***	.7685***	.9453***
Criminal Code	.7415***	.8830***	.8007***	.6801***	.6795***	.8431***	.4759*	.7972***	.8967***	.6664***	.9498***
<b>Violent</b>	<b>.8021***</b>	<b>.8000***</b>	<b>.8094***</b>	<b>.8142***</b>	<b>.6460***</b>	<b>.9182***</b>	<b>.5555**</b>	<b>.7669***</b>	<b>.8805***</b>	<b>.7220***</b>	<b>.9446***</b>
Robbery	.7371***	.8617***	.8314***	.7014***	.7479***	.8328***	.4460*	.7536***	.8880***	-.1203	.7675***
Property	.7332***	.8845***	.8022***	.6868***	.6571***	.8252***	.4388*	.8104***	.9026***	.6243***	.9301***
Break and Enter	.7196***	.8699***	.8153***	.6382***	.5736**	.7798***	.4662*	.8016***	.9424***	.6615***	.9061***

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000 population.

**Table 5**  
**Full time police strength per 1,000 population with crime rates lagged five years.<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.7368***	.8335***	.8352***	.7580***	.7031***	.8230***	.3956	.8087***	.8649***	.7281***	.9664***
Criminal Code	.7195***	.8931***	.8400***	.7189***	.6917***	.8129***	.3501	.7767***	.8727***	.5830**	.9712***
<b>Violent</b>	<b>.8399***</b>	<b>.8737***</b>	<b>.8979***</b>	<b>.8405***</b>	<b>.7714***</b>	<b>.9429***</b>	<b>.4627*</b>	<b>.8096***</b>	<b>.8912***</b>	<b>.7378***</b>	<b>.9526***</b>
Robbery	.6720***	.8755***	.8512***	.7744***	.7497***	.8113***	.2321	.7664***	.8962***	.0812	.8142***
Property	.7230***	.8993***	.8464***	.7453***	.6806***	.8228***	.3010	.8017***	.8922***	.5607**	.9665***
Break and Enter	.6951***	.8884***	.8172***	.7052***	.6197**	.7994***	.2860	.8050***	.9228***	.5990**	.9230***
<b>Males 18-34</b>											
Total Offences	.8039***	.6319**	.8806***	.8282***	.6915***	.8524***	.4499*	.7664***	.8370***	.8417***	.9192***
Criminal Code	.7778***	.8992***	.9038***	.8126***	.7004***	.8429***	.3907	.7750***	.8617***	.6412***	.9397***
<b>Violent</b>	<b>.9278***</b>	<b>.8207***</b>	<b>.7519***</b>	<b>.8083***</b>	<b>.8011***</b>	<b>.9733***</b>	<b>.5455**</b>	<b>.6926***</b>	<b>.7138***</b>	<b>.8017***</b>	<b>.9046***</b>
Robbery	.7062***	.8519***	.8867***	.8330***	.7698***	.8396***	.2320	.7338***	.8817***	-.0505	.6939***
Property	.7806***	.8924***	.9032***	.8489***	.6752***	.8532***	.3204	.8061***	.8893***	.6065**	.9244***
Break and Enter	.7425***	.8716***	.8949***	.7971***	.5686**	.8186***	.3098	.7947***	.9216***	.6470***	.8679***
<b>Males 15-24</b>											
Total Offences	.6749***	.6154**	.8434***	.7317***	.6027**	.7734***	.3310	.7406***	.8323***	.6804***	.9454***
Criminal Code	.6725***	.8366***	.8391***	.6541***	.6200**	.7766***	.2968	.7330***	.8464***	.5510**	.9583***
<b>Violent</b>	<b>.8185***</b>	<b>.7769***</b>	<b>.8531***</b>	<b>.8116***</b>	<b>.7165***</b>	<b>.9483***</b>	<b>.4207</b>	<b>.7247***</b>	<b>.8224***</b>	<b>.7088***</b>	<b>.9367***</b>
Robbery	.6371***	.8314***	.8565***	.7528***	.7161***	.7898***	.1862	.7115***	.8803***	-.0506	.7512***
Property	.6717***	.8429***	.8398***	.6958***	.5961**	.7818***	.2405	.7567***	.8706***	.5172*	.9464***
Break and Enter	.6466***	.8258***	.8200***	.6478**	.5039*	.7481***	.2444	.7493***	.9153***	.5611**	.8659***

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000 population.

### Correlations of Police Strength with Subsequent Crime Rates

Next, the methodology is reversed and the relationships between lagged police strength and subsequent crime rates are explored. Tables 6, 7 and 8 report the correlation coefficients of police strength per 1,000 population lagged one, three and five years respectively with the selected crime rates. The pattern of results is almost identical to that found when the crime rates were lagged. There is a pattern of statistically significant and strong positive correlation between police strength and subsequent crime rates. In contrast to when crime rates were lagged five years, even the coefficients involving Quebec data are statistically significant and positive when police strength is lagged five years. There are a few exceptions to this pattern of statistically significant positive associations when police strength is lagged five years. The exceptions are the coefficients involving robbery for males 18-34 in Nova Scotia and Newfoundland, and those involving violent offences for males 18-34 for Alberta and Saskatchewan. For the Prince Edward Island data, none of the associations between police strength and subsequent rates of robbery are significant.

**Table 6**  
**Selected male crime rates correlated with police strength per population lagged 1 year<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.9384***	.9250***	.9531***	.9658***	.8899***	.9594***	.8220***	.9554***	.9526***	.8828***	.9519***
Criminal Code	.9209***	.9574***	.9258***	.8631***	.8763***	.9637***	.7941***	.9429***	.9709***	.8828***	.9161***
<b>Violent</b>	<b>.8621***</b>	<b>.9077***</b>	<b>.9227***</b>	<b>.8635***</b>	<b>.7728***</b>	<b>.8723***</b>	<b>.7677***</b>	<b>.8387***</b>	<b>.9487***</b>	<b>.7456***</b>	<b>.9337***</b>
Robbery	.9446***	.8728***	.9218***	.8138***	.8431***	.9626***	.8433***	.9208***	.8247***	.0708	.6075***
Property	.9233***	.9447***	.9233***	.8470***	.8733***	.9553***	.8000***	.9613***	.9651***	.8584***	.8289***
Break and Enter	.9225***	.9348***	.9328***	.8060***	.8123***	.9486***	.8165***	.9499***	.9282***	.8780***	.8367***
<b>Males 18-34</b>											
Total Offences	.9208***	.7439***	.7898***	.9638***	.8339***	.9428***	.7844***	.8959***	.9252***	.8522***	.8799***
Criminal Code	.9065***	.9220***	.8021***	.8741***	.8445***	.9568***	.7630***	.9193***	.9672***	.8827***	.8332***
<b>Violent</b>	<b>.7825***</b>	<b>.7914***</b>	<b>.5920**</b>	<b>.7288***</b>	<b>.7255***</b>	<b>.7817***</b>	<b>.7053***</b>	<b>.6890***</b>	<b>.8301***</b>	<b>.6676***</b>	<b>.8737***</b>
Robbery	.9457***	.8150***	.8306***	.8068***	.8003***	.9573***	.8337***	.8779***	.7341***	-.1473	.4299*
Property	.9110***	.8988***	.7992***	.8522***	.8302***	.9398***	.7762***	.9443***	.9600***	.8426***	.6578***
Break and Enter	.9164***	.8840***	.8834***	.8059***	.7397***	.9302***	.8069***	.9158***	.8933***	.8576***	.6834***
<b>Males 15-24</b>											
Total Offences	.8225***	.8026***	.8235***	.9203***	.8127***	.8989***	.6733***	.9080***	.9573***	.8550***	.9352***
Criminal Code	.8179***	.9166***	.7208***	.7724***	.8119***	.9115***	.6657***	.9082***	.9515***	.8411***	.8892***
<b>Violent</b>	<b>.7126***</b>	<b>.8160***</b>	<b>.6703***</b>	<b>.7315***</b>	<b>.7055***</b>	<b>.7492***</b>	<b>.6041***</b>	<b>.7621***</b>	<b>.8996***</b>	<b>.6693***</b>	<b>.9316***</b>
Robbery	.9003***	.8714***	.8766***	.7501***	.7898***	.9199***	.7879***	.8967***	.8387***	-.0187	.5288**
Property	.8287***	.9104***	.7411***	.7608***	.8072***	.9144***	.6859***	.9334***	.9444***	.8166***	.7682***
Break and Enter	.8405***	.9009***	.8261***	.7244***	.7320***	.9015***	.7278***	.9223***	.9293***	.8452***	.7586***

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000.

**Table 7**  
**Selected male crime rates correlated with police strength per population lagged 3 years.<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.9586***	.9425***	.9169***	.9760***	.9220***	.9705***	.8812***	.9649***	.9084***	.9226***	.9694***
Criminal Code	.9453***	.9531***	.8885***	.8737***	.9183***	.9774***	.8639***	.9635***	.9642***	.9165***	.9196***
<b>Violent</b>	<b>.8422***</b>	<b>.9234***</b>	<b>.8624***</b>	<b>.8004***</b>	<b>.8086***</b>	<b>.8338***</b>	<b>.7828***</b>	<b>.8476***</b>	<b>.9331***</b>	<b>.7081***</b>	<b>.9194***</b>
Robbery	.9582***	.8206***	.8743***	.8082***	.8501***	.9592***	.9281***	.9318***	.9822***	.0808	.6176***
Property	.9496***	.9291***	.8928***	.8487***	.9114***	.9703***	.8853***	.9744***	.9676***	.9032***	.8072***
Break and Enter	.9554***	.9238***	.9014***	.8227***	.8536***	.9707***	.9025***	.9716***	.8905***	.8838***	.8145***
<b>Males 18-34</b>											
Total Offences	.9191***	.7827***	.5383**	.9138***	.8638***	.9443***	.8224***	.9055***	.8605***	.7975***	.9242***
Criminal Code	.9130***	.9224***	.6235***	.8455***	.8852***	.9629***	.8187***	.9389***	.9570***	.8975***	.8407***
<b>Violent</b>	<b>.7097***</b>	<b>.8098***</b>	<b>.2359</b>	<b>.5298**</b>	<b>.7538***</b>	<b>.6956***</b>	<b>.6811***</b>	<b>.6771***</b>	<b>.7911***</b>	<b>.5703**</b>	<b>.8479***</b>
Robbery	.9428***	.7493***	.6762***	.7635***	.7885***	.9410***	.9190***	.8794***	.5463**	-.1410	.4525*
Property	.9203***	.8807***	.6477***	.8114***	.8651***	.9461***	.8559***	.9555***	.9613***	.8703***	.5969**
Break and Enter	.9367***	.8702***	.7575***	.7913***	.7801***	.9459***	.8874***	.9371***	.8422***	.8302***	.6569***
<b>Males 15-24</b>											
Total Offences	.8484***	.8598***	.7519***	.9328***	.8704***	.9189***	.7295***	.9289***	.9267***	.8552**	.9567***
Criminal Code	.8461***	.9345***	.6608***	.7859***	.8727***	.9319***	.7332***	.9375***	.9535***	.8740***	.8898***
<b>Violent</b>	<b>.6876***</b>	<b>.8510***</b>	<b>.5329**</b>	<b>.6581***</b>	<b>.7562***</b>	<b>.6992***</b>	<b>.6102**</b>	<b>.7769***</b>	<b>.8531***</b>	<b>.6209***</b>	<b>.9214***</b>
Robbery	.9281***	.8481***	.8118***	.7489***	.8056***	.9167***	.8908***	.9184***	.7002***	.0230	.5606**
Property	.8625***	.9180***	.6935***	.7616***	.8666***	.9413***	.7752***	.9584***	.9554***	.8669***	.7423***
Break and Enter	.8827***	.9128***	.7765***	.7436***	.7983***	.9409***	.8186***	.9612***	.9064***	.8585***	.7521***

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000 population.

**Table 8**  
**Selected male crime rates correlated with police strength per population lagged 5 years.<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.9841***	.9422***	.8855***	.9657***	.9694***	.9816***	.9251***	.9838***	.8176***	.9067***	.9623***
Criminal Code	.9779***	.9387***	.8888***	.9002***	.9717***	.9870***	.9189***	.9878***	.9442***	.9497***	.8919***
<b>Violent</b>	<b>.8613***</b>	<b>.9273***</b>	<b>.8545***</b>	<b>.7225***</b>	<b>.8748***</b>	<b>.8334***</b>	<b>.8133***</b>	<b>.9325***</b>	<b>.9573***</b>	<b>.7348***</b>	<b>.9360***</b>
Robbery	.9480***	.7257***	.8096***	.7970***	.9038***	.9704***	.9254***	.9041***	.5468**	.1107	.5464**
Property	.9810***	.9135***	.8812***	.8792***	.9663***	.9751***	.9463***	.9716***	.9583***	.9373***	.7315***
Break and Enter	.9847***	.9053***	.8991***	.8569***	.9371***	.9688***	.9528***	.9316***	.8349***	.8652***	.7485***
<b>Males 18-34</b>											
Total Offences	.9456***	.8255***	.2014	.8154***	.9336***	.9626***	.8550***	.9640***	.7467***	.6995***	.9228***
Criminal Code	.9442***	.9189***	.4631*	.8399***	.9541***	.9783***	.8667***	.9792***	.9394***	.9241***	.8005***
<b>Violent</b>	<b>.7019***</b>	<b>.8376***</b>	<b>-.1052</b>	<b>.2988</b>	<b>.8279***</b>	<b>.6594***</b>	<b>.6927***</b>	<b>.8321***</b>	<b>.8483***</b>	<b>.5832**</b>	<b>.8718***</b>
Robbery	.9202***	.6399***	.4435*	.7017***	.8458***	.9556***	.9058***	.8556***	.3902	-.1172	.4013
Property	.9519***	.8718***	.4559*	.8112***	.9368***	.9537***	.9166***	.9624***	.9568***	.8951***	.4615*
Break and Enter	.9674***	.8565***	.6433***	.8024***	.8809***	.9426***	.9354***	.8971***	.7724***	.7762***	.5872**
<b>Males 15-24</b>											
Total Offences	.9018***	.8948***	.7696***	.9398***	.9478***	.9607***	.7955***	.9841***	.8761***	.8680***	.9383***
Criminal Code	.8980***	.9360***	.6809***	.8246***	.9500***	.9665***	.8071***	.9851***	.9623***	.9236***	.8449***
<b>Violent</b>	<b>.7252***</b>	<b>.8781***</b>	<b>.5163*</b>	<b>.6054**</b>	<b>.8410***</b>	<b>.7077***</b>	<b>.6614***</b>	<b>.9007***</b>	<b>.9198***</b>	<b>.6693***</b>	<b>.9425***</b>
Robbery	.9511***	.7876***	.7868***	.7445***	.8718***	.9429***	.9294***	.9164***	.5976**	.0742	.5034*
Property	.9152***	.9164***	.6933***	.8049***	.9460***	.9779***	.8607***	.9799***	.9728***	.9201***	.6473***
Break and Enter	.9344***	.9082***	.7925***	.7904***	.9039***	.9699***	.8948***	.9489***	.8855***	.8599***	.6878***

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000 population.

### Third Order Correlations of Crime Rates with Subsequent Police Strength

The analysis thus far indicates that crime rates and police strength have been moving in tandem. Both the literature review and the third order coefficients reported in Table 2 suggest that the relationship between crime rates and police strength may be influenced by other extraneous variables. Hence, in this section, the temporal association is explored with controls introduced for some of the factors which may be influencing the relationship. Tables 9 through 11 present the third order correlation coefficients of crime rates with subsequent police strength with controls introduced for the unemployment rate, consumer price index, and a time variable.

When the crimes rates are lagged one year (Table 9), almost one-third (58/180) of the coefficients are significant. The majority of these statistically significant associations are found in three provinces with Quebec having 15, Nova Scotia 12, and Manitoba 11. The coefficients tend to be positive for Quebec and Nova Scotia but negative for Manitoba. For both Alberta and Prince Edward Island none of the correlations are significant. When the constructed crime variables are lagged one year, none of third order coefficients are significant across all of the provinces. The coefficients involving police strength and total offences for males 18-34 and total offences for males 15-24 reach significance in six provinces; however the direction of these associations is not consistent across the provinces. For example, while the coefficients between total offences for

males 18-34 and police strength one year later are positive and statistically significant for four provinces (Saskatchewan, Quebec, Nova Scotia, and New Brunswick), they are negative and statistically significant for British Columbia and Manitoba.

While the coefficients tend to be negative when the crime rates are lagged three years (Table 10), very few of the relationships examined here are statistically significant. None of the third order coefficients are significant across all of the provinces. Only in two provinces, Saskatchewan and Manitoba, is there a tendency for statistically significant negative coefficients between crime rates and police strength three years later. For the Manitoba data, all of these negative coefficients are significant except for robbery rates per 1,000 males. For the Saskatchewan data, fifteen of the eighteen coefficients are negative and significant. The exceptions are the coefficients involving total offences.

When the crime rates are correlated with police strength five years later (Table 11), 41 of the 180 provincial correlation coefficients are significant. There appears to be no pattern to the findings either across crime variables or across provinces. For example, while the association between total offences for males 18-34 and police strength five years later is significant in five provinces, the direction of the association is not consistent. For Alberta and Prince Edward Island, it is positive and significant, whereas for British Columbia, New Brunswick and Nova Scotia, the reported coefficients are negative and significant.

In addition, for the Quebec data, all of the coefficients are negative but none reach significance. At five years, the data clearly does not show any consistent patterns.

**Table 9**

Full time sworn police strength per 1,000 population correlated with selected male crime rates lagged one year: third order correlation coefficients controlled for unemployment rate, consumer price index and a time variable.<sup>1</sup>

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.6644***	-.3154	.3501	.4000	-.1190	.4584*	.6012**	.6052**	.7359***	.2506	-.1315
Criminal Code	.7292***	.3056	.1715	.0850	-.2479	.4064	.6250***	.5480**	.7058***	.3372	-.1055
<b>Violent</b>	<b>.1164</b>	<b>-.5294**</b>	<b>.4053</b>	<b>-.0608</b>	<b>-.6326**</b>	<b>.0059</b>	<b>.3836</b>	<b>-.0289</b>	<b>.1979</b>	<b>-.1869</b>	<b>-.4742*</b>
Robbery	.7352***	.0635	.3394	-.0543	-.1257	.3681	.5937**	.3361	.4220*	-.1438	-.0932
Property	.5832**	.1164	.1272	-.0057	-.2622	.1205	.6687***	.4564*	.5890**	.2358	-.1177
Break and Enter	.5502**	.1207	.2852	-.3317	-.3622	-.1670	.6033**	.2254	.6639***	.3555	.2276
<b>Males 18-34</b>											
Total Offences	.4451*	-.6576***	.3056	.4622*	-.5133*	.3184	.4741*	.4275*	.7208***	-.1097	-.3122
Criminal Code	.5305**	-.4698*	-.0397	.0613	-.5543**	.2986	.5402**	.4253*	.6350***	.2020	-.2559
<b>Violent</b>	<b>-.1616</b>	<b>-.6903***</b>	<b>.0907</b>	<b>-.0612</b>	<b>-.6898***</b>	<b>-.1680</b>	<b>.2254</b>	<b>-.1372</b>	<b>-.0127</b>	<b>-.2838</b>	<b>-.4843*</b>
Robbery	.7367***	-.1554	.2722	-.0513	-.2782	.2750	.5990**	.2632	.3904	-.1759	-.1346
Property	.3303	-.4572*	-.0849	-.0556	-.5101*	-.0450	.6437***	.3271	.4227*	.1197	-.2606
Break and Enter	.4018	-.3642	.1455	-.2874	-.4764*	.3200	.6025**	.1039	.5774**	.2713	.1263
<b>Males 15-24</b>											
Total Offences	.5248***	-.6359**	-.0573	.3572	-.5797**	.5686**	.4365*	.5337**	.7475***	.0879	-.0235
Criminal Code	.4726*	-.3437	-.2451	-.1206	-.5710**	.5125*	.4944*	.4839*	.6432***	.2640	-.0364
<b>Violent</b>	<b>-.1606</b>	<b>-.6806**</b>	<b>-.1272</b>	<b>-.1618</b>	<b>-.6687***</b>	<b>.0025</b>	<b>.1550</b>	<b>-.1338</b>	<b>-.0521</b>	<b>-.2634</b>	<b>-.3767</b>
Robbery	.7358***	-.1048	.1426	-.1335	-.3040	.3733	.5998**	.2780	.3895	-.1495	-.0687
Property	.2734	-.3635	-.2575	-.1927	-.5426**	.1395	.6270***	.3904	.3803	.1680	-.0629
Break and Enter	.3700	-.2803	-.0544	-.3585	-.4835*	-.2242	.6045**	.1429	.5683**	.2973	.2677

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000 population.

**Table 10**

**Full time sworn police strength per 1,000 population correlated with selected male crime rates lagged three years: third order correlation coefficients controlled for unemployment rate, consumer price index and a time variable.<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	-.0890	-.0481	.2617	.0343	-.6129**	-.1343	-.2123	-.0822	.2584	.3687	-.3507
Criminal Code	-.0717	.5388	.1111	-.6357**	-.5582**	-.0956	-.1762	-.3496	.1294	.2737	-.2095
<b>Violent</b>	<b>-.0229</b>	<b>-.1763</b>	<b>.0155</b>	<b>-.4707*</b>	<b>-.6070**</b>	<b>.2324</b>	<b>-.4363*</b>	<b>-.1310</b>	<b>-.0518</b>	<b>-.0892</b>	<b>-.2402</b>
Robbery	-.1646	.2092	.0692	-.4984*	-.4255	-.3829	-.2296	-.3955	.2863	-.4393*	.0056
Property	-.1163	.3960	.1459	-.5611**	-.5317*	-.2334	-.1932	-.3933	.0688	.0733	-.1150
Break and Enter	-.2082	.2371	.1970	-.5207*	-.5910**	-.5310*	-.1271	-.3473	.5030*	.0938	.3440
<b>Males 18-34</b>											
Total Offences	-.3031	-.3669	.3366	.0595	-.7604***	-.2748	-.2691	-.1991	.2005	.0235	-.5127*
Criminal Code	-.1725	.1481	.1273	-.5452*	-.6781***	-.2037	-.2060	-.4020	.0536	.1627	-.4317
<b>Violent</b>	<b>-.1695</b>	<b>-.4312</b>	<b>-.0101</b>	<b>-.3741</b>	<b>-.6641***</b>	<b>-.0018</b>	<b>-.4944*</b>	<b>-.1805</b>	<b>-.1823</b>	<b>-.1318</b>	<b>-.3949</b>
Robbery	-.1735	.1019	.1035	-.4365*	-.4956*	-.4635*	-.2315	-.4447*	.2563	-.4220	-.0359
Property	-.1596	.0857	.1821	-.4670*	-.6213**	-.3100	-.2102	-.4827*	-.0281	-.0026	-.3270
Break and Enter	-.2568	-.0099	.2389	-.4442*	-.6420**	-.6141**	-.1303	-.4215	.4782*	.0461	.2183
<b>Males 15-24</b>											
Total Offences	-.4813*	-.3922	.0813	-.1220	-.8196***	-.1672	-.2911	-.2450	.1757	-.1674	-.3643
Criminal Code	-.3577	-.0536	-.3171	-.5909**	-.7340***	-.1271	-.2419	-.5275*	-.0362	-.0426	-.2531
<b>Violent</b>	<b>-.2536</b>	<b>-.4739*</b>	<b>-.3665</b>	<b>-.4934*</b>	<b>-.6349**</b>	<b>.1258</b>	<b>-.4610*</b>	<b>-.2201</b>	<b>-.2363</b>	<b>-.2340</b>	<b>-.2796</b>
Robbery	-.2730	.0391	-.0612	-.4811*	-.5479**	-.4022	-.2697	-.4875*	.2233	-.4263	.0097
Property	-.3034	-.0449	-.1212	-.4991*	-.6725***	-.2617	-.2563	-.5744**	-.1152	-.1523	-.1500
Break and Enter	-.3884	-.1060	.0509	-.4769*	-.6775***	-.5882**	-.1873	-.5094*	.4559*	-.0724	.3190

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000 population.

**Table 11**

**Full time sworn police strength per 1,000 population correlated with selected male crime rates lagged five years: third order correlation coefficients controlled for unemployment rate, consumer price index and a time variable.<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	-.2041	-.5990**	.4689*	.3065	-.3565	-.2275	-.2716	-.6013**	-.3949	.6553**	-.0772
Criminal Code	-.1128	.0269	.5018*	-.0013	-.4019	-.0864	-.3228	-.7219***	-.2875	.1107	.2313
<b>Violent</b>	<b>.4827*</b>	<b>-.3403</b>	<b>.5639*</b>	<b>-.0998</b>	<b>-.2835</b>	<b>.6694**</b>	<b>-.1670</b>	<b>-.4242</b>	<b>-.4004</b>	<b>-.2025</b>	<b>.0012</b>
Robbery	-.0953	.1249	.3611	.1400	-.2789	.1481	-.0515	.0240	.2083	-.2551	-.1340
Property	.0242	.0396	.4740*	-.0112	-.4385	.1176	-.2636	-.4290	-.0225	-.0514	.3405
Break and Enter	-.0746	-.0150	.3346	.0533	-.4702*	.1727	-.3369	-.4785*	.3631	.3707	.2739
<b>Males 18-34</b>											
Total Offences	-.1663	-.6275**	.5191*	.3086	-.4248	-.2397	-.2770	-.6103**	-.4731*	.5427*	-.2397
Criminal Code	.0191	-.1181	.5889**	.1541	-.4325	-.0415	-.3215	-.6844***	-.3506	.1768	.0382
<b>Violent</b>	<b>.6390**</b>	<b>-.4375</b>	<b>.5699*</b>	<b>-.0753</b>	<b>.2670</b>	<b>.6694**</b>	<b>-.1673</b>	<b>-.4223</b>	<b>-.5195*</b>	<b>-.1798</b>	<b>-.1506</b>
Robbery	-.0104	.1401	.4631*	.1962	-.2651	.1973	-.0295	-.0432	.1851	-.2341	-.1258
Property	.1862	-.0330	.5907**	.1479	-.4713*	.1870	-.2539	-.4741*	-.0741	.0155	.2253
Break and Enter	.0584	-.0597	.4906*	.1968	-.4879*	.2013	-.3306	-.5269*	.3849	.3875	.2158
<b>Males 15-24</b>											
Total Offences	-.4512	-.6334**	.2928	.2010	-.5362*	-.2670	-.3718	-.7128***	-.5078*	.2104	-.2481
Criminal Code	-.2758	-.4063	.2104	-.3084	-.5232*	-.0885	-.4097	-.7349***	-.4113	-.1596	-.0080
<b>Violent</b>	<b>.3054</b>	<b>-.4860*</b>	<b>.4360</b>	<b>-.2927</b>	<b>.0825</b>	<b>.7502***</b>	<b>-.2728</b>	<b>-.4511</b>	<b>-.5421*</b>	<b>-.3970</b>	<b>-.1969</b>
Robbery	-.1264	-.0247	.2614	.0381	-.4071	.1885	-.0635	-.0607	.1669	-.2849	-.1541
Property	-.0509	-.2795	.2207	-.1825	-.5329*	.1547	-.3430	-.5159*	-.1232	-.2225	.1803
Break and Enter	-.1489	-.2660	.1599	-.1357	-.5415*	.2077	-.4069	-.5487*	-.3557	.2260	.1641

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000 population.

### Third Order Correlations of Police Strength with Subsequent Crime Rates

In this section, the relationship between police strength and subsequent crime rates are examined. Again, controls are introduced for some of the extraneous factors which may be influencing the relationship. Tables 12 through 14 present the third order correlation coefficients of police strength lagged one, three and five years with each of the eighteen constructed crime variables with controls introduced for the unemployment rate, consumer price index, and a time variable. The number of statistically significant relationships between per capita police strength and subsequent rates of selected crimes progresses steadily as one moves from a lag of one year (55 coefficients reach significance), to three years (91), to five years (101). For Canada as a whole, the same tendency can be seen.

When police strength is lagged one year (Table 12), there are no clear patterns to the results across the crime variables. Positive coefficients involving police strength and subsequent rates of total offences for all males and criminal code offences for all males appear across the ten provinces, yet in neither case do the coefficients reach significance consistently. The coefficients involving violent crimes tend to be negative, although not necessarily significant. Only two of the correlation coefficients are significant in half of the provinces. The two offences are total offences for all males and violent crimes for males 18-34. Within three of the provinces, however, the coefficients involving each of these crime rates tend to be positive. The provinces are New Brunswick, Nova Scotia and Prince

Edward Island.

With police strength lagged three years (Table 13), several of the correlation coefficients are significant. When crime rates are expressed per 1,000 males, the coefficients involving total offences are positive and significant in seven provinces; the coefficients involving criminal code offences are positive and significant in six provinces; and those involving property offences are positive and significant in five. When crime rates are expressed per 1,000 males 18-34, the coefficients involving criminal code offences are positive and significant in five provinces. As well, the coefficients involving property offences for males 15-24 and break and enter for males 15-24 are positive and significant in six provinces.

The most striking features of Table 13 are twofold. One is the fact that except for violent crime, almost all statistically significant coefficients are positive. The majority of these statistically significant positive correlation coefficients occur in five provinces - Quebec, New Brunswick, Newfoundland, Prince Edward Island and Ontario. The other striking feature of Table 13 is the pattern of results involving violent crimes. Whether crime rates are expressed per 1,000 male population, per 1,000 for males 18-34, or per 1,000 for males 15-24, the coefficients of police strength and violent crimes three years later tend to be negative and statistically significant across the provinces. There are a few exceptions to this tendency. These occur in three provinces. For the Quebec data, the coefficient between police strength and violent crime for all males is positive and significant,

and the coefficients for males of specified ages are not significant. For the Nova Scotia data, the coefficients for total males and males 18-34 are not significant. In addition, for the data from British Columbia, the coefficient involving violent crimes for total males is not significant.

These patterns are even more pronounced when police strength is lagged with crime rates five years later (Table 14). With the exception of Quebec, the coefficients between police strength and violent crimes five years later tend to be negative and statistically significant. The coefficients involving violent crimes per 1,000 for males are negative and significant in five provinces. The provinces are Saskatchewan, Manitoba, Ontario, Nova Scotia and Prince Edward Island. When rates of violent crime are expressed per 1,000 males of specified ages, the coefficients are significant in seven provinces. Alberta, Saskatchewan, Manitoba, Ontario, New Brunswick, Nova Scotia, and Prince Edward Island. Rates of violent crime in both British Columbia and Newfoundland which were negative and statistically significant at one and three year lags are not statistically significant with a lag of five years. As well, for the Quebec data none of the coefficients involving violent crime are significant.

In terms of the relationship between police strength lagged five years and the subsequent rate of the other crime variables examined here, there is a strong pattern of statistically significant positive correlation coefficients. This pattern is particularly pronounced in four provinces, Newfoundland, New Brunswick,

Quebec, Ontario, but it is also seen in Prince Edward Island, and Manitoba. In the remaining provinces, British Columbia, Alberta, Saskatchewan and Nova Scotia, few of the relationships reach significance.

**Table 12**

**Selected male crime rates correlated with police strength per 1,000 population lagged one year: third order correlation coefficients controlled for unemployment rate, consumer price index and a time variable.<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.5633**	.0731	.5564**	.5970**	.1991	.2503	.3627	.6958***	.6355***	.4575*	.0672
Criminal Code	.5706**	.4396*	.2941	.2905	.1069	.4013	.3483	.7455***	.5847**	.6179**	.0736
<b>Violent</b>	<b>-.3310</b>	<b>-.3260</b>	<b>-.0144</b>	<b>-.1905</b>	<b>-.7233***</b>	<b>-.4604*</b>	<b>.4775*</b>	<b>-.1680</b>	<b>.3392</b>	<b>-.4079</b>	<b>-.5814**</b>
Robbery	.7456***	.2800	.4036	.0238	-.3485	.5744**	.6136**	.3456	.5417**	-.1617	.0404
Property	.4244*	.2957	.2858	.1515	.0642	.1813	.4165*	.7193***	.4061	-.5318**	.0584
Break and Enter	.5055*	.1950	.3916	-.0834	-.1922	.3127	.4549*	.5970**	.1851	.4854*	.1607
<b>Males 18-34</b>											
Total Offences	.2623	-.5060*	.1465	.3341	-.1963	.0508	.2135	.5356**	.6195**	.0529	-.1831
Criminal Code	.2527	-.2769	-.0683	-.1265	-.2737	.2312	.2230	.6519***	.5383**	.4733*	-.0948
<b>Violent</b>	<b>-.5118*</b>	<b>-.5932**</b>	<b>-.2395</b>	<b>-.3006</b>	<b>-.7841***</b>	<b>-.5261**</b>	<b>.2752</b>	<b>-.2738</b>	<b>.0882</b>	<b>-.5071*</b>	<b>-.6145**</b>
Robbery	.6936***	.0851	.2421	-.0965	-.4989*	.4088	.5826**	.2460	.4916*	-.1731	-.0179
Property	.1089	-.2807	-.0247	-.2157	-.2517	-.0212	.3314	.6456***	.3037	.4167*	-.0757
Break and Enter	.3126	-.2898	.1382	-.3249	-.3923	.1460	.4031	.5130	.0814	.3954	.0524
<b>Males 15-24</b>											
Total Offences	.1868	-.4713*	-.1782	.3035	-.2211	.2006	.1496	.6303***	.5846**	.2924	.1619
Criminal Code	.0976	-.1624	-.2470	-.1970	-.3523	.3604	.1603	.7093***	.4429*	.5665**	.1380
<b>Violent</b>	<b>-.4998*</b>	<b>-.5807**</b>	<b>-.3780</b>	<b>-.3257</b>	<b>-.7599***</b>	<b>-.4007</b>	<b>.1365</b>	<b>-.2643</b>	<b>-.0880</b>	<b>-.4552*</b>	<b>-.5069</b>
Robbery	.6927***	.1332	.0793	-.1316	-.5205*	.4687*	.5879**	.2900	.5106*	-.1678	.0642
Property	.0024	-.1902	-.2024	-.2481	-.2852	.1038	.2999	.6978***	.1585	.4969*	.1114
Break and Enter	.2379	-.2198	-.0943	-.3806	-.4331*	.2734	.3889	.5660**	.0224	.4398*	.2111

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000.

**Table 13**

**Selected male crime rates correlated with police strength per 1,000 population lagged three years: third order correlation coefficients controlled for unemployment rate, consumer price index and a time variable.<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.6352**	.2236	.4611*	.4982*	.3405	.4741*	.6720***	.6325**	.3468	.5866**	.6044**
Criminal Code	.5593**	.4482*	-.0959	-.2241	.2604	.5565**	.6475**	.7255***	.2381	.6644***	.5350*
<b>Violent</b>	<b>-.8076***</b>	<b>-.2801</b>	<b>-.5223*</b>	<b>-.5633**</b>	<b>-.7377***</b>	<b>-.7724***</b>	<b>.4819*</b>	<b>-.4549*</b>	<b>-.1978</b>	<b>-.5373*</b>	<b>-.7060***</b>
Robbery	.6380**	.3343	.3090	-.0183	-.3922	.1698	.7916***	.4332*	.0765	-.2467	.5462**
Property	.4554*	.3126	.0243	.0209	.2425	.4373*	.6718***	.7273***	.2236	.6171**	.5112*
Break and Enter	.5913**	.3085	.2001	-.0247	-.1756	.5743**	.7027***	.8271***	.0124	.5296	.4579*
<b>Males 18-34</b>											
Total Offences	.2099	-.4476*	-.3811	-.2295	-.0199	.2700	.4873*	.5069*	.3321	.1507	.4049
Criminal Code	.0406	-.2626	-.5479*	-.6721***	-.0908	.3461	.4917*	.6599***	.1905	.4837*	.4054
<b>Violent</b>	<b>-.8828***</b>	<b>-.5796**</b>	<b>-.7142***</b>	<b>-.6847***</b>	<b>-.7993***</b>	<b>-.7694***</b>	<b>.1355</b>	<b>-.5800**</b>	<b>-.2375</b>	<b>-.6282**</b>	<b>-.7261***</b>
Robbery	.4956*	.1401	-.0344	-.2226	-.5154*	-.0480	.7530***	.3264	.0319	-.2828	.4999*
Property	.0156	-.2684	-.4282	-.5231*	-.0500	.2256	.5622**	.6675***	.1627	.4744*	.4118
Break and Enter	.2978	-.2012	-.3341	-.4366*	-.3658	.3969	.6307**	.7798***	-.0414	.4024	.3639
<b>Males 15-24</b>											
Total Offences	-.0641	-.4099	-.6017**	-.1783	-.0709	.2027	.3341	.5381*	.2534	.1539	.6570***
Criminal Code	-.3451	-.1853	-.6447**	-.6820***	-.2089	.2585	.3460	.6657***	.0189	.4529*	.5802**
<b>Violent</b>	<b>-.9127***</b>	<b>-.5683**</b>	<b>-.7396***</b>	<b>-.6694***</b>	<b>-.7921***</b>	<b>-.8068***</b>	<b>-.1703</b>	<b>-.5715**</b>	<b>-.5327*</b>	<b>-.6663***</b>	<b>-.5988**</b>
Robbery	.4597*	.1874	-.2000	-.1992	-.5805**	-.1417	.7300***	.3849	.0184	-.2977	.5652**
Property	-.2174	-.1982	-.5718**	-.5328*	-.1060	.1875	.4774*	.6951***	-.0589	.4810*	.5479**
Break and Enter	.1508	-.1321	-.5336*	-.4581*	-.4431*	.3854	.5805**	.8169***	-.1607	.4067	.4926*

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000.

**Table 14**

**Selected male crime rates correlated with police strength lagged five years: third order correlation coefficients controlled for unemployment rate, consumer price index and a crime variable.<sup>1</sup>**

Offence <sup>2</sup>	Canada	B.C.	Alberta	Sask.	Manitoba	Ontario	Quebec	N.B.	N.S.	P.E.I.	Nfld.
<b>Males all ages</b>											
Total Offences	.8256***	.1963	.3408	.5137*	.6961***	.8552***	.7610***	.7924***	-.1082	.5502*	.7176***
Criminal Code	.7761***	.2002	-.1917	-.2018	.6386**	.8555***	.7644***	.7486***	-.1831	.7077***	.7041***
<b>Violent</b>	<b>-.7539***</b>	<b>-.0184</b>	<b>-.3422</b>	<b>-.7948***</b>	<b>-.6434**</b>	<b>-.6872***</b>	<b>.4055</b>	<b>-.4441</b>	<b>-.5254*</b>	<b>-.6326**</b>	<b>-.3725</b>
Robbery	.7015***	-.0046	.3371	.0177	.1884	.4783*	.7773***	.4780*	.0543	-.0567	.7008***
Property	.7514***	-.0450	-.0385	.2138	.6758***	.8410***	.8249***	.7247***	-.0488	.6893***	.6962***
Break and Enter	.8327***	-.1005	.2303	-.0322	.3319	.8146***	.8424***	.7337***	-.1845	.5328*	.6207**
<b>Males 18-34</b>											
Total Offences	.5439*	-.2992	-.4505	-.2573	.4655*	.7564***	.6209**	.7029***	-.1388	.1407	.6088**
Criminal Code	.3948	-.3645	-.5788**	-.6334**	.3928	.7499***	.6427**	.6619**	-.2318	.5621*	.6429**
<b>Violent</b>	<b>-.8703***</b>	<b>-.3122</b>	<b>-.5529*</b>	<b>-.8527***</b>	<b>-.6850***</b>	<b>-.7115***</b>	<b>.0643</b>	<b>-.5992**</b>	<b>-.4644*</b>	<b>-.7009***</b>	<b>-.4028</b>
Robbery	.5726**	-.1837	.0488	-.1756	-.3226	.3356	.7248***	.3677	.0652	-.0911	.6671**
Property	.4324	-.5047*	-.4629*	-.3404	.4771*	.7212***	.7497***	.6338**	-.0617	.5789**	.6499**
Break and Enter	.6541**	-.4899*	-.2787	-.4252	.1343	.7146***	.7938***	.6635**	-.1825	.4180	.5740**
<b>Males 15-24</b>											
Total Offences	.2485	-.2698	-.5471*	-.2540	.3711	.6535**	.4631*	.7642***	-.1531	.0651	.7363***
Criminal Code	-.0350	-.3067	-.5939**	-.7044***	.2077	.6111**	.5096*	.7190***	-.2938	.4940*	.7167***
<b>Violent</b>	<b>-.9290***</b>	<b>-.3068</b>	<b>-.5715*</b>	<b>-.8634***</b>	<b>-.7246***</b>	<b>-.7787***</b>	<b>-.2819</b>	<b>-.5593*</b>	<b>-.5180*</b>	<b>-.7509***</b>	<b>-.2372</b>
Robbery	.5292*	-.1231	-.0658	-.1757	-.4279	.1598	.7099***	.4330	.0556	-.1139	.7077***
Property	.2001	-.4677*	-.5230*	-.4243	.3755	.6674**	.6858***	.7027***	-.1403	.5584*	.7076***
Break and Enter	.5266*	-.4671*	-.4055	-.5101*	.0240	.6688**	.7576***	.7206***	-.2426	.4043	.6345**

<sup>1</sup> Two tailed tests. \* is p LE .05; \*\* is p LE .01; \*\*\* is p LE .001.

<sup>2</sup> All variables are expressed as rates per 1,000.

To summarize the data presented in the previous tables:

- 1) There is a strong positive association between provincial per capita police strength and provincial rates for selected crimes, whether crime rates are expressed per 1,000 males or per 1,000 males of specified ages, for the 27 year period spanning 1962 to 1988. Crime rates and police strength appear to be moving in tandem in the ten Canadian provinces.
- 2) In addition to changes in the age and sex structure of the population, both police strength and crime rates are being influenced by one or more additional variables. Much of the relationship between police strength and each of the constructed crime variables disappears when controls are introduced (See Tables 1 and 2). It is clear then that some of the zero order relationship between police strength and crime rates is attributable to the unemployment rate, the consumer price index, or some other factor being tapped by the time variable.
- 3) The nature of the relationship between police strength and violent crimes may be different from the relationship of police strength with the other crime rates considered in this analysis. In contrast to the other coefficients presented in Table 2, the coefficients involving violent crimes tend to be negative. The only consistently non-significant third order correlation coefficients appear in the Quebec data, suggesting that the nature of the relationship between police strength and violent crimes may be different

in Quebec than in the other provinces of Canada (Table 2).

- 4) Controlling only for the age and sex structure of the population, the relationship between crime rates, including violent crimes, and subsequent police strength (Tables 3 through 5) is positive.
- 5) Controlling only for the age and sex structure of the population, the relationship between police strength and subsequent crime rates (Tables 6 through 8) is positive.
- 6) All else being equal, that is, controlling for unemployment, consumer price index, and time, there appears to be no consistent relationship between crime rates and subsequent police strength (Table 9 through 11).
- 7) When unemployment, inflation and time are controlled, higher rates of per capita police strength are generally associated with higher crime rates, excluding violent crimes (Tables 12 through 14). This pattern is seen when police strength is lagged one year in New Brunswick, Nova Scotia and Prince Edward Island. When police strength is lagged three years, it is also seen in Ontario, Quebec, and Newfoundland, but no longer seen in Nova Scotia. With a lag of five years, it is also seen in Manitoba. As well, the tendency for positive and significant coefficients is stronger in all these provinces, except Nova Scotia, at five years than at three. The western provinces, British Columbia, Alberta and Saskatchewan seem to be exceptions to this general tendency. The coefficients for the few

relationships which reach significance in these three provinces tend to be negative and occur when the crime rates are expressed per capita males of specified ages.

- 8) All else being equal, the relationship between police strength and subsequent rates of violent crime tends to be negative (Tables 12 through 14). This tendency is particularly strong when police strength is lagged three years. The pattern of results for Quebec differ from the other provinces with statistically significant positive coefficients at one and three year lags when violent crime is expressed per capita male.

In summary, the level of police strength per capita and the rate of selected crimes are positively associated with one another for the 27 year period spanning 1962-1988. Controlling only for changes in the age and sex structure of provincial populations, these variables are positively associated over time as well. That is to say, that either increased crime rates are associated with subsequent increases in levels of police strength or decreased crime rates are associated with decreases in levels of police strength one, three and five years later. Reversing the variables, reveals that at the same time, increased police strength is associated with increased rates of selected crimes or decreased police strength is associated with decreased rates of crime one, three and five years later. It appears then that the level of police strength and the reported rate of various crimes have been broadly moving in tandem over the years.

Clearly, however, the association between reported crimes and police strength is substantially moderated by other variables at the provincial level, including unemployment, consumer price index and/or some other factor(s) being tapped by the time variable. Controlling for these additional variables, much of the temporal association between the selected crime rates and subsequent police strength disappears. Lagging crime rates one, three and five years reveals no consistent relationship between the crime rates studied here and subsequent levels of per capita police strength when controls are introduced.

Controlling for unemployment, consumer price index and some other factor(s) being tapped by the time variable, there is a relatively consistent pattern of positive correlation coefficients between lagged police strength and subsequent rates of crime (excluding violent). This tendency is particularly pronounced when police strength is lagged three years, and becomes even more pronounced when police strength is lagged five years. This positive association between police strength and subsequent crime rates appears in the provinces at slightly different lags. For example in Nova Scotia, it is only seen when police strength is lagged one year, whereas in the other provinces it becomes stronger, the longer the lag. Despite a rather strong tendency for a positive association between police strength and crime rates, these positive associations are not seen in the most westerly provinces - British Columbia, Alberta and Saskatchewan.

The relationship between violent crime rates and police strength per capita

appears different than that involving the other crime rates examined here. Controlling for unemployment, consumer price index and time, the coefficients involving police strength and subsequent rates of violence tend to be negative and statistically significant across all the provinces except Quebec.

The analysis involving rates of violence in Quebec appear a bit of an anomaly. While the Quebec data is consistent with the majority analysis in terms of the other crime variables studied here, there appears to be no consistent relationship between per capita police strength and rates of violence in Quebec whether violent crime rates are lagged or police strength is lagged.

To conclude this section, we are left with three major findings. First, positive associations between crime rates and per capita police strength, both in lagged and unlagged correlations suggest that crime rates and police strength have been moving in tandem over the years.

Second, with the introduction of controls for unemployment, consumer price index and time, there is a tendency for police strength to be positively associated with the subsequent reported rates of selected crimes including robbery, break and enter, property crimes, criminal code offences, and total offences. Thus, either increased police strength is associated with subsequent increases in the reported rates of selected crime or decreased police strength is associated with subsequent decreases in reported rates of selected crime. There are exceptions to this finding. The exceptions occur in British Columbia, Alberta,

and Saskatchewan.

Third, is the tendency for a negative association between police strength and subsequent rates of violence, when controls are introduced. This tendency is seen in all provinces except Quebec. In the following section of this report, these findings will be addressed.

## Chapter 5 - Discussion

This analysis replicated the approach utilized by Koenig in an effort to validate the pattern of his findings at the level of the provinces. Both studies have sought to clarify whether increased crime rates precede, follow or occur concurrently with increased levels of police strength.

In the analysis of the national level data, Koenig finds evidence to support a broad two stage pattern for the relationship between police strength and crime rates. Koenig indicates that "long-term, on going social forces have been generating steadily increasing rates of reported crime" (Koenig:1991:16). Controlling for unemployment, inflation (CPI), and time, Koenig finds a tendency for increased crime rates (excluding violence) to be associated with higher per capita police strength both in unlagged correlations and when crime rates are correlated with per capita police strength one year later. The pattern reverses, however, at three and five years with a tendency for negative correlations whereby lower crime rates are associated with higher not lower levels of police strength. While controlling for these same factors, Koenig finds a tendency for higher levels of police strength to be associated with higher crime rates both in unlagged correlations and when police strength is correlated with crime rates one, but particularly, three and five years later. Koenig offers an interpretation whereby crime rates and police strength are increasing in tandem. Increased

levels of per capita police strength, however, merely generate increased police activity and hence higher reported rates of crime. We see then the spiralling effects increased police strength have on reported rates of crime.

Koenig's analysis also suggests that rates of violent crime have a momentum of their own. According to Koenig (1991:iii):

"Increased levels of [reported] violence provide the rationale for increased levels of police strength per capita, but that these increased levels of police strength merely generate increased police activity, activity which has not necessarily been well targeted at containing violent crime".

Furthermore:

"Although rates of reported violent crime continue to increase despite increased police strength, they increase less dramatically than would have been the case with lower levels of police strength" (Koenig: 1991:17).

The analysis of the provincial data is relatively consistent with the analysis upon which it is based. There is a congruence in terms of the three major findings. First, both analyses reveal a positive zero order association between crime rates and police strength, and police strength and crime rates, both in lagged and unlagged correlations. Thus, it appears that per capita police strength and crime rates have been moving in tandem over the 27 year period of study.

Second, the provincial analysis reveals a general pattern of positive associations between per capita police strength and subsequent levels of selected crimes when unemployment, consumer price index and time are controlled.

Thus, it appears that, in most provinces, increased police strength tends to precede increased reported rates of crime. Increased police strength per capita has typically been associated with subsequent increases in the reported rates of selected crimes (i.e. robbery, break and enter, all property offences, criminal code offences and total offences).

Third, both analyses find that violent crime has a dynamic of its own. Consistent with Koenig's analysis, this analysis reveals a negative association between lagged police strength and subsequent reported rates of violence at the provincial level. While reported levels of violence continue to increase, this analysis suggests that provincially reported rates of violence have at least been moderated by increased police strength.

While the provincial level analysis is, for the most part, supportive of Koenig's general findings, there are exceptions to the findings identified above. In terms of the tendency for positive associations between police strength and subsequent reported levels of crime, the data from the three most westerly provinces, British Columbia, Alberta, and Saskatchewan, are not consistent with the majority analysis. In addition, the absence of any consistent relationship between lagged police strength and subsequent rates of violence in Quebec is a deviation from the national findings.

The fact that the provincial analysis is not entirely consistent with the analysis based on the national data is not surprising. There are numerous

weaknesses with the data used in this study. The weaknesses lay primarily with the police strength figures, the consumer price index and the population figures.

The police data for each of the provinces is not necessarily comparable from one year to the next throughout the 27 year period as it appears that the criteria for administratively allocating the RCMP to the provinces appears to have changed in an unsystematic manner. It is not clear whether the RCMP in the statistics were allocated to a province by the function being served rather than by where they were physically located. If, however, police are assigned on the basis of their physical location, this may account for the apparent discrepancy of Saskatchewan in the analysis. The training school for the Royal Canadian Mounted Police is located in Regina, Saskatchewan. Police strength per capita would be artificially inflated in Saskatchewan as these cadets would be counted in terms of police strength but have no effect whatsoever on the production of recorded crime. If this is indeed happening, it would be hiding the "real" relationship between police strength and subsequent crime rates.

It is even possible that the allocation of the RCMP to provinces was part of a political agenda to make certain provinces believe they were receiving additional support from Ottawa. The absence of any consistent relationship between lagged police strength and subsequent rates of violence in Quebec may reflect an artificial inflation of police strength per capita in that province.

An additional limitation of the data is that reporting practices for the data

on both police strength and crime rates may not have been consistent across jurisdictions or across years during the early years of study. Statistics Canada (1992A:2) identifies this as a possibility. The survey from which both the police and crime data are culled was first implemented in 1962, the first year of interest to this study. It may have taken some provinces longer than others to develop a consistent and standardized method of reporting. The method adopted by each province may still not be consistent across the provinces. Such possibilities make the provincial data considerably more problematic than the national level analysis upon which it was based.

An additional weakness in this analysis relates to the consumer price index figures which were used. The consumer price index does not exist at the provincial level. In this analysis, the consumer price index of the province's largest city or capital was used as a proxy for the provincial consumer price index. Noise was introduced to the data due to the use of a proxy consumer price index.

Deficiencies which existed with the national level data, undoubtedly have become more pronounced and hence more problematic with the analysis at the provincial level. The level of aggregated data used in the national analysis, relative to the provincial analysis, may have minimized data variation from one year to another.

This study, like the study upon which it was based, used a measure of

police strength which refers to full time sworn police officers. This measure does not consider changes in working conditions over time such as hours of work or technological advances. While the use of a time variable was intended to control for the influence of such things, the time variable was linear and the effects of such things might not have been. The significance of differences in provincial police working conditions undoubtedly becomes more pronounced when doing a provincial level analysis than when the data is aggregated to the national level. It is possible that with the historically strong labour movement in British Columbia that working conditions are considerably different than elsewhere in the country. This could contribute to the apparent difference between British Columbia and the majority analysis in terms of increased police strength preceding increased rates of crime.

Despite the number of weaknesses with the data, the pattern to the findings is generally consistent with the national level analysis that it is seeking to replicate. Data deficiencies may account for the exceptions to the general tendencies which occur in the provincial analysis. However, the exceptions to the general findings may also indicate that the relationship between crime rates and police strength, if correctly specified here, is not absolutely consistent across the provinces. If this is the case, other factors at the provincial level are also influencing the relationship between these variables.

As no theory of crime causation has been fully substantiated, the

possibilities are numerous. The crime data used in this study is quite variable across the provinces. One possible explanation for this would be that there may be differentials in tolerance towards certain behaviours at the provincial level. People in some provinces or regions may be less likely to invoke a criminal justice system response to behaviour which was typically dealt with by less formal means of control. Provinces may differ in terms of their willingness to augment informal control mechanisms with more formal means of social control. They may use the mental health, medical, military, and other such things before involving the police. In Saskatchewan, for example, during the mid 1930s unemployment relief camps were established to deal with the number of transients flocking through the cities in search of work (Brown:1978).

Community attitudes may determine what "criminal" behaviour is responded to in an official capacity and what is not. While this is speculative, if provinces differ in terms of their tolerance to certain behaviours, the crime rates for some provinces may be inflated because local cultures might influence residents in some provinces to be much more aggressive than residents in other provinces in the reporting of sexual and nonsexual assaults, thefts, etc. to the police. For example, the Canadian Victimization Survey of 1982 reported considerable variation between cities in terms of the reporting rates of various offences. Of the cities in the survey, Edmonton had the lowest proportion of reported sexual assaults, yet had the highest proportion of reported robberies and

motor vehicle thefts (Solicitor General Canada:1984:2). Similarly, communities and provinces may vary in their willingness and ability to augment police strength. This could vary over time and even in response to factors which appear removed from the criminal justice system (such as relative tax bases or the pressure of women's groups to respond to domestic assault and date rape).

Another possibility is that there may be more "actual" crime in the western provinces as a result of migration. The provinces differ dramatically in terms of the rates of in-migration and out-migration. The Atlantic provinces have experienced high rates of out-migration and generally lower levels of in-migration than the rest of the country. According to Semean and Elkins (1979:47) "the low level of immigration may mean little importation of new ideas; the high level of emigration may mean that some of the most modern "individuals" especially from the lower class have left." Furthermore, it is suggested that as a result these provinces become more conservative and traditional than provinces which experience high rates of in-migration. In fact, the literature suggests that those who leave their home provinces are least likely to be conformists. Both British Columbia and Alberta have experienced rapid population growth over the period of study attributable primarily to high rates of both interprovincial and international migration. Between 1972 and 1983, for example, British Columbia and Alberta gained half a million people through exchanges with the rest of the country alone (Dumas:1989:51). The people coming to the western provinces from

the other provinces were typically young, male, and mobile. The result is that the two most westerly provinces have higher percentages of people without strong ties to the community and a higher percentage of people who are more likely to engage in criminal activity.

Another possible explanation for increased crime rates preceding increased police strength in the western provinces may lie with the existence of anti-establishmentarian local cultures. Historically, protest politics has been associated with the western provinces. Third parties in the political process, at both the provincial and national level, have either begun in the west or found their strongest support there. For example, when the Social Credit party first came to Canada, it found its' strongest support in Alberta (Pinard:1975). Subsequently, it has also received strong support in British Columbia. The Social Credit party which developed reflects a strong militant and right wing stance. The CCF, now the NDP, began in Saskatchewan (Schultz et al.:1979). The significance of these developments is that they reflect a dissatisfaction with the traditional ways and with the establishment. What this suggests is that people in the western provinces may feel less bound to the conventional ways and may in essence feel freer to deviate. Couple this up with the high levels of immigration to the western two provinces, and these provinces may indeed be more liberal and open to new ideas. The people may be more tolerant of diversity. As a result, they may be much slower than in other parts of Canada to resort to increased

social control of nonconformists, one aspect of which is an increased police presence.

While these ideas are merely speculative, they clearly indicate that factors at the provincial level, additional to those controlled for in this analysis, may also be influencing the relationship between reported crime and police strength.

To conclude this section, the system capacity hypothesis, tested here, asserts that by increasing the number of police, the amount of crime brought to the attention of police will increase, not only in the short term as some deterrent-crime reduction theories would suggest, but in the longer term as well. While the findings of this study generally lend support to such a system capacity interpretation, the data from the three most westerly provinces deviated from this overall pattern. In British Columbia, Alberta, and Saskatchewan, increased police strength tends to be negatively associated with subsequent crime rates when controls are introduced, particularly when expressed per 1,000 male population of specified ages. Deficiencies with the data may account for the deviation of the western provinces from the majority analysis. It is possible, however, that additional factors at the provincial level are also influencing the relationship between reported crime and police strength.

## Chapter 6 - Conclusion

The purpose of this study was to examine the relationship between per capita police strength and reported rates of crime. Specifically, this study sought to validate the pattern of findings observed by Koenig in a correlational analysis of police strength and crime rates in Canada over a twenty seven year period. Specifically, the research questions were:

- 1) Do increased levels of police strength per capita precede, follow or occur concurrently with increased rates of reported crime (robbery, break and enter, all property crimes, all criminal code offences, and total offences)?  
and
- 2) Do reported rates of violent crime have a dynamic of their own? Are higher levels of police strength associated with subsequent rates of violence which are lower than they otherwise would have been?

This study replicated the approach utilized by Koenig. The ten provinces, as opposed to Canada, were the units of analyses. Provincial crime rates were correlated with police strength for the 27 year period spanning 1962 to 1988. Six measures of crime were used. They were robbery, all violent offences, break and enter, all property offences, criminal code offences and total offences. Each was expressed per capita male, per capita male 18-34 and per capita male 15-24 resulting in the operationalization of eighteen crime variables. Controls were

introduced for unemployment, consumer price index and time. Crime rates were lagged with police strength in subsequent years to determine whether crime rates precede increased levels of police strength. As well, police strength was lagged with crime rates in subsequent years to examine whether increased police strength preceded increased rates of reported crime.

The analysis of the provincial data is relatively consistent with the analysis upon which it is based. There is a congruence in terms of the three major findings. First, both analyses reveal a positive zero order association between crime rates and police strength, and police strength and crime rates, both in lagged and unlagged correlations. Thus, it appears that per capita police strength and crime rates have been moving in tandem over the 27 year period of study.

Second, the provincial analysis reveals a general pattern of positive associations between per capita police strength and subsequent levels of selected crimes when unemployment, consumer price index and time are controlled. Thus, it appears that, in most provinces, increased police strength tends to precede increased reported rates of crime when controls are introduced for unemployment, consumer price index and time. Increased police strength per capita has typically been associated with subsequent increases in the reported rates of selected crimes (i.e. robbery, break and enter, all property offences, criminal code offences and total offences).

Third, both analyses find that violent crime has a dynamic of its own.

Consistent with Koenig's analysis, this analysis reveals a negative association between lagged police strength and subsequent reported rates of violence at the provincial level. While reported levels of violence continue to increase, this analysis suggests that provincially reported rates of violence have at least been moderated by increased police strength.

While the provincial level analysis is, for the most part, supportive of Koenig's general findings, there are exceptions to the findings identified above. In terms of the tendency for positive associations between police strength and subsequent reported levels of crime, the data from the three most westerly provinces, British Columbia, Alberta, and Saskatchewan, are not consistent with the majority analysis. In addition, the absence of any consistent relationship between lagged police strength and subsequent rates of violence in Quebec is a deviation from the national findings.

While deficiencies in the provincial data may account for the discrepancies between the national level and provincial level analysis, it is also suggested that factors at the provincial level may influence the relationship between reported crime and police strength. These include differentials in tolerance towards certain behaviours, rates of population in-migration, anti-establishment local cultures and informal controls.

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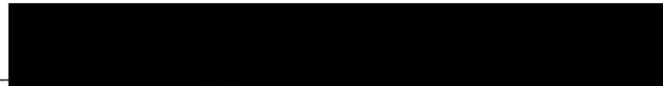
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