

# Towards the Measurement of Criminality in Canada A Replication Study

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## Article abstract

MESURE DE LA DELINQUANCE AU CANADA

« Mesure de la delinquance au Canada » presente les resultats definitifs d'une replique methodologique de l'etude de T. Sellin et M.E. Wolfgang qui ont valide, il y a quelques annees, un indice de la criminalite pour les Etats-Unis. Le but de la presente recherche vise a mettre au point un indice semblable pour le Canada.

Le Bureau federal de la statistique est responsable de la compilation des statistiques criminelles canadiennes. Ces statistiques sont basees sur les rapports annuels des differents corps de police du Canada et la classification des crimes est semblable, dans l'ensemble, au systeme americain communement appele Uniform Crime Reporting.

Ce systeme ne tient pas compte, toutefois, de la gravite relative des differentes violations de la loi. Cette carence biaise toute analyse de l'etendue et de la nature de la criminalite dans le temps et dans l'espace. C'est ce qui determina Sellin et Wolfgang, ainsi que les auteurs de la presente etude, a y remediier.

L'objectif principal de la recherche est la quantification des elements qualitatifs inherents aux evenements criminels. Aux Etats-Unis, un systeme pondere, fruit de l'analyse des attitudes caracterisant des echantillons d'etudiants universitaires, de policiers et de juges de la Cour juvenile, servit a cette fin.

La strategie de la presente etude repose sur un « modele de replique minimum ». Ce modele, legitime par la validite des resultats, des interpretations et des conclusions de la recherche de Sellin et Wolfgang, reprend le dernier stade — qui est aussi le plus essentiel — de l'etude originale. Quatorze versions de delits criminels sont alors retenues afin de developper l'indice final.

Les postulats de base qui sous-tendent cet indice sont les suivants:

- 1) La mesure de la criminalite et de la delinquance juvenile doit etre fondee sur une echelle de gravite qui reflete les sentiments de la communaute sur la gravite relative des differents delits criminels.
- 2) L'indice doit etre elabore a partir de renseignements details, tires des rapports de police et non a partir des etiquettes legales qui sont apposees aux evenements criminels.
- 3) En ce qui concerne la delinquance juvenile: a) les delits commis par les jeunes delinquants ne sont independamment du type de cours ou de procedes qui menent a leur jugement; b) l'indice ne doit tenir compte que des violations qui seraient considerees comme criminelles si ces jeunes delinquants etaient des adultes.
- 4) L'indice doit etre fonde sur les delits criminels qui sont de nature a amener rapidement les victimes ou leurs proches a rapporter lesdits evenements a la police.
- 5) L'indice doit etre fonde sur les delits qui sont rapportes d'une facon un tant soit peu constante et qui causent un prejudice explicite aux membres de la communaute, tels que les blessures corporelles, le vol et la perte des biens ou les dommages a la propriete. L'indice exclut: a) les delits impliquant le consentement de la victime et la conspiration; b) les delits dont la decouverte depend surtout de l'activite de la police; c) les delits qui ne sont que des attentats ne produisant aucun dommage corporel ou materiel.
- 6) L' unite de compilation doit etre l' « evenement » pris dans sa totalite et non un seul element, si important soit-il.
- 7) Une echelle de proportions (ratio) est la plus appropriee, particulierement a cause de la qualite cumulative d'une telle echelle.
- 8) Des variables supposément importantes — telles que le type d'armes ou la legalite de la presence du coupable — n'accroissent pas la gravite des delits et n'entrent donc pas en ligne de compte.

L'échantillon canadien est de 2 738 sujets. Des étudiants, des juges, des policiers et des employés de bureau ont participé à cette étude. Les méthodes et les techniques employées furent empruntées au domaine de la psychophysique, particulièrement aux travaux de S.S. Stevens, de l'Université de Harvard. Ces travaux établissent une relation mathématique entre « stimulus » et « perception ».

Chaque sujet recut les quatorze descriptions de delits criminels auxquels il attacha des poids numeriques variant selon ses attitudes particulieres. Ces resultats numeriques furent compiles a l'aide de la moyenne geometrique et analyses par les methodes de correlation (r) et de regression (b).

Les hypotheses majeures de Sellin et Wolfgang, sur la base de ces resultats, furent reformulees de la facon suivante:

Expectative minimum

Si les indices de gravite des delits tires de deux populations (sexe, culture, pays) sont confrontes, la relation qui existe entre eux doit etre une fonction ayant la forme  $Y = aXb$  (les points traces graphiquement sur papier log-log se placent sur une ligne droite). Il est evident que cette expectative ne s'applique qu'aux delits choisis par Sellin et Wolfgang.

Expectative maximum

Si les indices de gravite des delits tires d'un grand nombre de populations ou de sous-populations (specialement a l'interieur d'un pays) sont mis en rapport, la relation qui se forme entre eux est une fonction ayant la forme  $Y = aXb$  (les points traces graphiquement sur papier log-log se placent sur une ligne droite); de plus, a mesure que le nombre de groupes dans l'echantillon augmente, la pente tend vers 1. De nouveau, ceci ne s'applique qu'aux delits choisis.

Les resultats de cette etude confirment la fiabilite et la stabilite de l'indice de Sellin et Wolfgang. Ils permettent l'elaboration d'un indice canadien de gravite des delits qui constitue une mesure raffinee de la criminalite et de la delinquance juvenile, capable de remplacer avantageusement celle utilisee presentement au Canada.

TOWARDS THE MEASUREMENT  
OF CRIMINALITY IN CANADA  
A REPLICATION STUDY

Dogan D. Akman  
and André Normandeau  
with an introduction by  
Thorsten Sellin and Marvin E. Wolfgang

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## INTRODUCTION

One of the most common conclusions of a research report is a suggestion that further research be done to test its substantive findings. This suggestion conveys the need for testing hypotheses yielded by new research data. That is, research performed in a new way on familiar phenomena, or research analyzed in traditional ways on freshly viewed phenomena may reach intriguingly new results. Whether the methods or the variables are different, the conclusions will usually be presented as tentative and the responding community of scholars should maintain honest doubt, refusing to leap too quickly to embrace the findings as valid or reliable. Perhaps more often in the social than in the physical sciences, research conclusions remain in this posture.

Replication means a repetition of research. In a sense, it can be said that all science is replicative, for theories and tools of work are but further refinements of what has preceded. The range to replication is wide, and we believe it unfortunate that too few efforts are made to repeat inquiries similar in substance and methodology, for often without this kind of repetition, the findings of a parent study may remain intellectually impotent, aborted and have no influence on subsequent generations of scholars.

To establish the cardinal tenets of research — reliability and validity —, replication is required. The dimensions of time and space must be added if scholars are to be convinced that research findings are more than parochial. Each research, however large-scale in scope initially, is a sample of history, and we need many samples drawn in the same style in

order to make valid assertions. The problems of designing research, the tedious labors of constructing routes of investigation and the anxiety of making decisions, all of which are found in parent studies, are, to be sure, reduced considerably in replication. But this reduction does not mean that repeating an earlier study is merely mechanical routine. There is « creative replication » that not only tests notions of temporal and spatial consistency but that also adds new ideas. The findings of one study often become guiding hypotheses of another and, upon replication, the original findings may be buttressed or slightly modified in support of an important theory.

It is in this spirit that we welcome the Canadian study reported here by our young colleagues who, while with us in graduate study, experienced our concern with a crime index and crime statistics in general. *The Measurement of Delinquency* (Sellin and Wolfgang, 1964) is the parent study but is original only in the sense that ideas developed and refined, over time or for other purposes, have been brought together in a new combination to tackle an old problem. Our own study contained current theory to guide empiric analysis, and we are reminded that Robert C. Hanson (1958) reported that among sixty sociological, replicated studies, including one hundred and twenty retested propositions, the ones that most firmly confirmed earlier studies were those based on concepts and terms containing clarity, precision and statistical refinements of findings. The clarity we sought to produce in *The Measurement of Delinquency* has been carefully reflected in the Canadian replication of a major part of our own study.

In the wide range of cultural diversities, Canada is not far removed from social values found in the United States. Nonetheless, there is difference in ethnicity, industrial development, heterogeneity, history, criminal law and so forth. Hence, research designed to examine the gravity of crime rated by many subjects throughout each province of Canada extends the findings of a study based primarily in a single metropolitan community on the east coast of the United States. Cross-cultural analysis is traditional in social anthropology but still is in infancy in criminology. Through the Canadian study has come an expansion of our knowledge about psychophysics, criminal statistics, index construction and cross-cultural comparisons. Substantive and procedural descriptions have subsequently become sharpened. From these improvements, theories of criminal

deviance and notions regarding the administration of justice may be further developed and thereby find new applications for policy and social action.

It is gratifying to see that the study yielded the conclusion that « the method used in constructing the Sellin-Wolfgang index is highly reliable and stable » and that there was only a slight difference in the scale values obtained in the replication compared with those derived in the parent research.

These findings suggest the possibility of constructing international comparative criminal statistics on a new basis. Nearly thirty years ago, one of the undersigned wrote:

If two crimes, no matter how varied in form, evoke the same degree of [social] resistance [i.e., equally high scores on a scale of seriousness] they may be regarded as injuring social values which the political group judges to be equivalent. In comparative research this concept would have interesting results. Instead of comparing the crime rates of various states for specific crimes, comparisons would be made between rates for crimes with correspondingly severe penalties, the most severe and the lightest penalties of the law of each state forming the limits of the scale for that state ... such scales ... would afford a sounder theoretical basis for the classification of crimes than the labels now found in the criminal codes ... From a scientific point of view it may be more important to know if violations of criminal law norms of a given strength of value are rare or prevalent, increase or decrease, than to know that a crime labelled as abortion or prostitution increases or decreases (Sellin, 1938, p. 37).

If, instead of a scale derived from a grading of legal penalties, mentioned in the above quotation, we were to substitute score values of seriousness, arrived at by the method used in the present study, and if different states or nations developed such scales, it would be possible to construct comparable indexes to criminality. The great differences in what the definition of any given crime means among countries have hitherto defied all but the crudest efforts to create uniform international criminal statistics.

*University of Pennsylvania*  
*Philadelphia, Pennsylvania*  
*July 1, 1967*

THORSTEN SELLIN  
MARVIN E. WOLFGANG

### *THE SCOPE OF THE MONOGRAPH \**

The emergence of criminology as a distinct academic discipline in Canada is one of the products of the unprecedented development of the social sciences which this country has witnessed since the late 1950's.

In 1961, Professor J.L.I.J. Edwards, in reviewing the state of Canadian teaching and research in criminology, noted « a paucity of reliable information regarding the incidence and causes of crime in Canada and regarding the efficacy or otherwise of existing methods of treatment of juvenile and adult offenders » (p. 176). This was none too surprising, since, as Professor Edwards pointed out: « In Canada the study of matters relating to crime and criminal behaviour has been traditionally viewed as being in the domain of the study of criminal law » (p. 176).

Although there were some experiments, particularly the plan introduced by Dean Kennedy of the Toronto Law School (1941) and the recommendations of the Fauteux Report (*Report*, 1956), they were short-lived, and it was not until 1960 that the first full-fledged degree-awarding Department of Criminology was established by Professor Denis Szabo at the University of Montreal. This was followed by the establish-

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\* Acknowledgments: The research reported in the following pages was conceived, undertaken and completed while we were pursuing our studies for a postgraduate degree, and because our time and our knowledge were limited and our status modest, we sought and fully received sponsorship and financial and technical assistance, as well as advice and guidance, from many sources.

We must first and foremost express our deep gratitude to Professor Denis Szabo, Director of the Department of Criminology, University of Montreal, who encouraged our project and sponsored it for financial assistance, and to the Canada Council of Art for their generous grant.

ment at the University of Toronto of a Centre of Criminology by Professor Edwards, who in so doing, fulfilled the ambition of Dean Kennedy to create an Institute of Criminal Law and Criminology.

Despite the establishment of these centres and the extensive and vigorous teaching and research undertaken at these institutions, there remains a great deal to be done. To realize the amount of work to be accomplished, it is sufficient to examine the bibliography of correctional and criminological literature published in Canada, prepared by the Canadian Corrections Association (1964 and 1966).

The relative retardation of Canada in developing a body of extensive and accurate criminological knowledge, awkward

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We are vastly indebted to our mentors at the University of Pennsylvania, Professors Thorsten Sellin and Marvin E. Wolfgang, for their encouragement, guidance, and advice at all stages of the project, as well as for their placing at our disposal the full facilities of the Center of Criminological Research, which they direct, and those of the statistical laboratory of the Department of Sociology of the University of Pennsylvania.

We gratefully acknowledge the counsel in matters of analysis and interpretation of Dr. S.S. Stevens of Harvard University, whose original work laid the foundation of the Sellin-Wolfgang index, and of Mr. Stanley Turner, Temple University, whose high competence and excellent sense of humor made the strenuous moments of the project more easy to bear.

We record our appreciation to Mr. Jack Hedblom, staff sociologist of the Pennsylvania Prison Society, Philadelphia, who travelled in Canada from coast to coast to conduct the various testing experiments at universities; Mr. John Hogarth, of the Centre of Criminology, University of Toronto, for his full cooperation in arranging the testing at that university; Director Jean-Paul Gilbert and Assistant to the Director, Mr. Guy Tardif, of the Montreal Police Department, who assisted in conducting the experiment with members of their department by placing all of the required facilities at the disposal of the writers; Mr. Hubert Potvin of Canadian Industries Limited, Montreal, who helped in testing of the white-collar group in our project.

At the thirteen universities where experiments were conducted, we received the generous assistance of Professors A. Pain (Memorial Univ.), A.F. MacDonald (St. Dunstan's Univ.), Aurele Young (Univ. of Moncton), D. Pullman (Univ. of New Brunswick), R.N. Crook (Dalhousie), Muriel Stern (McGill), Jean-Paul Montminy (Laval), J.L.I. Edwards (Toronto), R.W. Pickering (Manitoba), Gwynn Nettler (Alberta), Aaron Bindman (Saskatchewan, Regina), and Adrian Marriage (British Columbia).

In sorting our data we have received the expert assistance of Mrs. Pierrette Normandeau, and the burden of budget administration has been greatly lightened by the capable management of Mrs. F.D. Dagenais of the University of Montreal.

Finally, last but certainly not least, our boundless gratitude goes to Jean Wilmot, whose commitment and devotion to our project, and painstaking labours, have kept the project rolling at all times, and ensured the preparation of various manuscripts and of this final paper.

To each and all of the above, and most particularly to Professors Szabo, Sellin and Wolfgang, we express our profound gratitude for having afforded us the rare opportunity of undertaking and completing this piece of research which, we hope, will be a valuable contribution to the development of criminology in Canada, as it has been an important contribution to our nascent careers as criminologists.



as it may be for the present, offers a major consolation, namely, what Professor Marcel Rioux has called *le privilège du retard historique*, that is, the privilege of the latecomers to learn and benefit from the knowledge and experience of those countries where criminology has long been an established discipline and achieved through considerable costs in terms of both money and manpower, and after a long series of trial and error.

We have availed ourselves of that privilege in the field of criminal statistics and measurement, and this monograph reports the results of a replication study of a crime and delinquency index developed by Professors Thorsten Sellin and Marvin E. Wolfgang (1964), with the double aim of assessing the reliability of that index and of constructing a similar index on a national basis for Canada.

The decision to undertake this study was due in part to the favourable position in which we found ourselves; however, our major reason for undertaking the project was our belief that, at its present stage of development, Canadian criminology can ill afford to invest its limited monetary and manpower resources in random projects, and that any criminological research project in Canada should be designed according to what we consider to be major priorities in the long list of tasks that lie ahead.

We believe that, among these priorities, the development of a standardized and sensitive measure of the extent of crime and delinquency, to *supplement* the existing crime statistics published by the Dominion Bureau of Statistics, is the most pressing need. As Lord Kelvin (see Wilkins, 1964) said: « When you can measure what you are speaking about and express it in numbers, you know something about it, but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind » (p. 284).

For reasons which will be detailed later and of which the reader may already be aware, crime statistics currently available in Canada do not provide adequate information regarding the extent and nature of crime and delinquency in Canada and certainly cannot be referred to as valid measures of the state of criminality in this country. Referring to these statistics, Professor Edwards (1961) has commented: « These reports contain much valuable material but there is all too frequent evidence of the dangers of adducing fallacious conclusions from

its compilations » (p. 176).

It would seem wise to remind ourselves at this point of the truism that development and progress in the field of criminology, as indeed in all fields of scientific endeavour, depend upon the ability to acquire, develop and use adequate instruments of measurement. Thus, it is clear that unless a measurement device is developed to assess adequately the changing incidence, frequency and character — that is, the *quantitative* and the *qualitative* aspects — of crime and delinquency, not only will the progress of theoretical and empirical knowledge about crime and delinquency be confined to speculations based on a few piecemeal findings, but it will also be impossible to develop effective social action programs for the control and prevention of crime and delinquency and the evaluation of their efficacy. This applies to Canada as well as to any other country<sup>1</sup>. As Professor Thorsten Sellin (1951) has pointed out:

There is, of course, both a physical and a financial limit to the scope of official reports, but in view of the tremendous funds spent by any modern State on its machinery of law enforcement broadly conceived, and the even greater social costs of criminality, the comparatively insignificant cost of good statistics that offer a maximum of data useful for the study of criminality ought to be considered not merely a wise but also a necessary investment. In devising such a system of statistics, however, it is no longer possible to rely solely on public administrators, who are likely to think chiefly of its value for administrative purposes. If they are to be of value for the study of criminality too, the behaviour scientist has to be consulted. Perhaps he must even be persuaded that it is his duty as a scholar to make a greater effort to secure their improvement and thereby increase the scientific significance of these records of crime (p. 504).

With the foregoing in mind, we decided to undertake our project. The research undertaken was, essentially, a replication study designed to accommodate the aims mentioned above. As such this monograph makes no claim either of offering a comprehensive analysis of crime statistics in general, and of Canadian statistics on crime and delinquency in particular, or of analysing in great length the data which they contain. These questions have been examined by a considerable number of

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1. A similar argument has been advanced recently by Nease (1966) who is one of the very few Canadian authors to have dealt with the necessity of devising adequate measurement methods in the study of juvenile delinquency.

scholars and it would be redundant and purposeless for us to repeat or to paraphrase here what has already been written. Instead, where appropriate we have taken the liberty of directing the reader to the relevant sources of information commenting on and criticizing various aspects of existent crime statistics (particularly, in the United States, the F.B.I. uniform crime reporting system), as almost all of this literature is applicable verbatim to Canadian crime statistics.

We therefore limited ourselves to a brief description of the « police statistics » published yearly by the Dominion Bureau of Statistics and the major shortcomings of such statistics which prompted Professors Sellin and Wolfgang to develop their index and us to replicate it in Canada.

In view of the very nature of this research, we have inevitably borrowed heavily from the original work, discussing, in the statement of assumptions underlying the study and in the research design, the essential structure of and reasons for the solution offered by Sellin and Wolfgang. We hope, however, that we have also made some contributions of our own in the analysis and interpretation of the findings, in the enlarged and revised edition of the Manual describing the method for constructing the crime and delinquency index in Canada, and in our treatment of the issues and objections which have been raised following the publication of the original study.

Whatever the merits and shortcomings of this report, while we admit the help received from various persons to whom acknowledgment has been made, we are solely responsible for the contents.

PART ONE  
CHAPTER ONE

CANADIAN  
CRIME STATISTICS:  
PROBLEMS AND A SOLUTION

The history of crime statistics dates back to the founding of social statistics in the 17th century. Since then, generations of distinguished scholars, beginning with Sir William Petty and followed by Jeremy Bentham, Guerry de Champneuf, Adolphe Quételet, André-Michel Guerry, Angelo Messedaglia, Alexander von Oettingen, George von Mayr, Diego de Castro, have tried to devise and improve upon various methods designed to assess the character, extent, nature and frequency of crime and delinquency. These scholars discussed the merits of various ways and means of making a statistical inventory of crime and delinquency that would accurately reflect trends across time and space. Their efforts have not succeeded in devising a « utopian » method — in fact, not even a satisfactory method — but their most significant contribution has been the important postulates which they formulated and which constitute the foundation of contemporary thinking on the subject of crime statistics. More importantly, by pointing out the limitations and the strengths of various possible methods of compiling criminal statistics, they led the way to the development of a consensus as to which of the available sources of information would provide the most adequate knowledge required to gauge trends in crime and delinquency<sup>2</sup>.

The contemporary consensus is that the amount of crime

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2. The historical developments and debates are discussed in considerable detail by Sellin and Wolfgang (1964) in Chapters 2 to 6, where the authors discuss successively the historical background for: a) the source of data; b) the choice of data; c) the qualitative element; d) the measurement of delinquency.

known to the police provides the best source of information<sup>3</sup>. In view of this, we shall limit our discussion of crime statistics in Canada to those compiled on the basis of police returns.

## A. CANADIAN CRIME STATISTICS: A GENERAL VIEW

In Canada, the history of statistics relating to crime dates as far back as 1876. According to Zay (1965):

The Criminal Statistics Act of that year made specific provisions for the furnishing of information by the various trial courts of general jurisdiction on their «criminal business» and by wardens of penal institutions on their inmates, to the Minister of Agriculture who until 1911 published an annual report based on these returns. The first reports entitled *Criminal Statistics* show the number of charges, acquittals and convictions, by judicial district, by class of offences, and by disposition, together with other information on each convicted person and on cases in which the prerogative of mercy of the Crown had been exercised. For the years 1912 to 1916, the annual reports were published by the Minister of Trade and Commerce; subsequently, they were published by the Dominion Bureau of Statistics (DBS). The Statistics Act of 1918, which provided for the establishment of the Bureau, consolidated the dispositions of the former law concerning the centralized collection of statistics by requiring that information on court business be transmitted to the Dominion Statistician. In 1926 the title of the annual reports was changed from *Criminal Statistics* to *Statistics of Criminal and Other Offences* (p. 634).

Crime statistics based on offences known to the police, however, were compiled only after 1920 and, with certain modifications, this series was continued until 1962 (Zay, 1963). In 1962, with a view toward publishing «more complete and accurate data on crime in Canada than was formerly possible», the Dominion Bureau of Statistics, with the cooperation of the Canadian Association of Chiefs of Police, working through the C.A.C.P. Committee on Uniform Crime Reporting, instituted a new series of police statistics based essentially on the Uniform Crime Reporting system used by the F.B.I. in the United States. In addition to this new series of statistics, the Bureau con-

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3. While Sellin and Wolfgang have discussed this question in detail, but comprehensive discussion of the question. See Beattie (1941, 1955 and 1960); Cressey (1958); Giffen (1962); Lejins (1960); Murphy *et al.* (1946); we refer the reader to the following references which will provide a brief Robnson (1933); Robison (1936); Sellin (1950 and 1953).

tinued to publish a considerable variety of other statistics in the field of crime, the collection of which had begun at different times since the enactment of 1876 <sup>4</sup>.

TABLE 1 (*part one*)

Comparison of the Uniform Crime Reporting offences classification system in Canada and the United States

Canada	United States
01 Murder	01 Criminal homicide
02 Non-capital murder	a. murder and non-negligent manslaughter
03 Attempted murder	
04 Manslaughter	
05 Rape (forcible)	02 Forcible rape
06 Other sexual offences (except 05 and 16)	14 Sex offenses (except 02 and 13)
07 Wounding — with intent and inflicting bodily harm	04 Aggravated assault
08 Assaults (not indecent)	08 Other assaults
09 Robbery	03 Robbery
10 Breaking and entering	05 Burglary — breaking and entering
11 Theft — motor vehicle	07 Auto theft
12 Theft — over \$50	06 Larceny — theft (except auto)
13 Theft \$50 and under	(a) \$50 and over in value
	(b) under \$50 in value
14 Have stolen goods	11 Stolen property: buying, receiving, possessing
15 Frauds	09 Forgery and counterfeiting
	10 Embezzlement and fraud
16 Prostitution	13 Prostitution and commercialized vice
17 Gaming and betting	21 Gambling
18 Offensive weapons	12 Weapons: carrying, possessing, etc.
19 Other criminal code (except traffic)	15 Offenses against family and children
	16 Narcotic drug laws
	17 Liquor laws (except 18)
	18 Drunkenness
	19 Disorderly conduct
	20 Vagrancy
20 Federal statutes (except traffic)	21 All other offenses (state or local laws except 1-20 and traffic)
21 Provincial statutes (except traffic)	
22 Municipal by-laws (except traffic)	

4. For a detailed and exacting review of available statistics, see Zay (1965).

TABLE 1 (*part two*)

Comparison of the Uniform Crime Reporting offences classification system in Canada and the United States

Canada	United States
Traffic enforcement	
1. Criminal negligence causing death	01 Criminal homicide b. manslaughter by negligence
2. Criminal negligence causing bodily harm	
3. Criminal negligence operating a motor	23 Violation of road and driving laws
4. Fail to stop or remain at scene of accident	25 Other violations of traffic and motor vehicle laws
5. Dangerous driving or without due care and attention	
6. Driving while intoxicated	22 Driving while intoxicated
7. Driving while impaired	
8. Driving while disqualified or while license suspended or cancelled	
9. Federal statutes (except parking)	
10. Provincial statutes (except parking)	
11. Municipal by-laws (except parking)	
12. Total number of parking violations	24 Parking violations

The Canadian version of the Uniform Crime Reporting system (hereafter referred to as the CUCR) seems not much different from its American counterpart, but two major modifications have been made. The first is related to the rank ordering of the most serious offences. A comparison of this differential rank ordering of crime classifications found in the two systems is listed in Table 1. The second modification is even more important and is related to the crime index, which consists in the United States of the first seven most serious offences, listed in descending order of assumed seriousness — criminal homicide, forcible rape, robbery, aggravated assault, burglary (breaking and entering), larceny (theft) and auto theft. In Canada, the index (if it may be so designated) is simply a gross addition of all criminal violations (excluding traffic offences).

According to the information provided in the introductory section of the yearly reports of the new series:

a) Police departments are required to send monthly crime statistics returns to the Dominion Bureau of Statistics covering nineteen Criminal Code Offence Classifications, Narcotic Control Act, Food and Drug Act, other Federal statutes, Provincial statutes, and the Municipal by-laws; and since January 1, 1963, the Provincial and territorial fire marshals and commissioners report the suspected and known incendiary (arson) offences.

b) In the reporting of offences, police include the number reported or known to the police, unfounded, actual number, offences cleared and persons charged. The term « unfounded » means that the investigation established that the offence did not happen or was not attempted. Unfounded offences are subtracted from those « reported or known to the police » to arrive at the « actual number of offences ». This term « actual number of offences » is abbreviated in the tables of the report to read « number of offences » or « total offences ».

c) Persons charged are reported as adult or juvenile and male or female. Total persons charged does not represent an unduplicated account of individuals charged during the year. The same person is counted on each occasion that he has been charged with having committed an offence.

d) The reports issued each calendar year survey offences reported by municipal forces in urban communities, by the Royal Canadian Mounted Police, Ontario Provincial Police, Quebec Provincial Police, the police of the Canadian National Railways and Canadian Pacific Railway and the National Harbour Board Police.

e) The data published include reports of offences for the following types of communities (see Table 2)<sup>5</sup>:

— Population of 750 and over, including urban areas policed under contract by the Royal Canadian Mounted Police and the Ontario Provincial Police.

— Population of less than 750, townships, districts and rural municipalities, policed under contract by the Royal Canadian Mounted Police or Ontario Provincial Police.

A number of urban municipalities are excluded from the report because:

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5. Figures provided by the Judicial Section of the Dominion Bureau of Statistics.



TABLE 2

Number of municipal and municipal contract contributors by population 1962 to 1965

Population of municipal contributors	1962		1963		1964		1965	
	Total	Actual	Total	Actual	Total	Actual	Total	Actual
Cities with population of:								
250 000 and over	7	7	7	7	7	7	7	7
100 000 — 250 000	6	6	6	6	6	6	6	6
50 000 — 100 000	19	19	20	20	25	25	29	29
25 000 — 50 000	50	48	49	49	56	55	57	55
10 000 — 25 000	122	114	119	116	125	123	126	126
5 000 — 10 000	146	132	146	129	156	151	169	149
2 500 — 5 000	183	168	184	172	198	183	193	177
750 — 2 500	325	277	320	275	296	262	279	237
Totals	838	771	851	774	869	812	867	787

— Community size is less than 750 population (although they have a police force).

— Communities are without a police force, although their population is more than 750.

— Police departments in communities with populations of 750 or over did not submit reports to the DBS.

f) The population used to calculate rates for offences reported and persons charged in Canada includes persons aged seven years or such other juvenile ages as may be established in a province (Dominion Bureau of Statistics, 1964).

## B. PROBLEMS OF ANALYSIS RELATED TO THE CUCR

In the perspective of the development of Canadian criminal statistics, the introduction of the Uniform Crime Reporting system undoubtedly represents some improvement upon the previous series. From an administrative viewpoint, these statistics are bound to be improved as the new system becomes fully operant and the initial difficulties are overcome<sup>6</sup>. The publishers of the new statistics are well aware of these and other problems when they state in their introduction:

Users of data are cautioned against drawing conclusions from comparisons of reported data between areas, whether provincial, metropolitan communities, etc., such as: the density and size of the population; population mobility, sometimes seasonal between areas; population stability within areas; composition of the population, including age, sex and other social characteristics; varying economic and social conditions; strength, training efficiency of local law enforcement agencies and facilities; variations in attitude regarding the reporting of offences to the police, towards law enforcement and prosecution (Dominion Bureau of Statistics, 1963, p. 1).

Needless to say, these problems beset the interpretation of all criminal statistics based on police returns. Allowing for shortcomings due to these problems, how adequate and useful are these statistics<sup>7</sup>?

If we take a utilitarian attitude, we would say that the usefulness of these statistics depends on their ability to provide

6. Considerable effort in this direction has and is being made. For the nature of some of the work done, see Friedland and Mohr (1964).

7. The references provided earlier with respect to the source of crime statistics discuss some of these problems. In addition, see Newham (1962); Pittman and Handy (1962).

organized and meaningful information required for discriminating social action. To examine the damning statements and criticisms made of the American Uniform Crime Reporting system, the answer is that our statistics, judged by the above criteria, are not very useful. Warner, in 1931, after a highly acid and lengthy analysis of the F.B.I. system declared: « Better no statistics than false statistics » (p. 331). More recently, Sophia M. Robison (1966) emphatically echoed Warner's statement when she pointed out that « The F.B.I. figures are not worth the paper they are printed on » (p. 1031). In a thorough and critical analysis of the American Uniform Crime Reporting system, Wolfgang (1963), noting the improvements made since their establishment, demonstrated in a more restrained manner the major and serious shortcomings of this system of recording crime and delinquency. Some of these statistical deficiencies — use of decennial census, per cent changes in the total volume of index offences, the crime clock, changes in the police performance and numerous other biases — are not characteristic of Canadian crime statistics, but the more fundamental of Wolfgang's criticisms are applicable verbatim to the CUCR system.

The basic reason for adjudging Canadian crime statistics (as indeed most crime statistics in other countries) as not useful in realizing the utilitarian aims stated earlier relates to the fundamental inability of the system to reflect an accurate picture of the state of criminality in Canada. If the sole aim of crime statistics were to provide the best approximation of the number of crimes and delinquent acts committed during a given year, in a given area, they would be judged satisfactory. But, obviously, a quantitative assessment of criminality sheds light on only one aspect of the problem; it certainly does not provide a measure of it<sup>8</sup>.

The basic aim of criminal statistics is (or ought to be) to measure not only the *quantity* but also and, more important, the *quality* of criminality, i.e., its seriousness.

It is only on the basis of this fuller information that we can « measure » crime and formulate valid and useful inferences about patterns and changes in the extent and nature of crime

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8. As Wilkins (1963) stated it: « Figures ... for indictable offences known to the police, figures ... for the number of persons proceeded against, figures ... for persons found guilty and many sets of other figures undoubtedly do not constitute a measure of crime » (p. 322).

and delinquency. Public officials, agencies dealing with prevention, control and treatment, researchers and the general public are (or should be) interested not only in the actual number of criminal events which occur in a given community, but more importantly, the objective amount of harm inflicted during these events, that is, the amount of personal injury, loss and/or damage of property sustained by members of the community and the community itself. As Nease (1966) has pointed out:

Information about the extent of delinquency is necessary for understanding and controlling it. We want to know at what point the most effective and feasible pressures can be applied. Perhaps ... the pessimistic results of many anti-delinquency programs would have been different if more effort had been expended in developing reliable measuring instruments (p. 133).

Discussing certain aspects of criminology, Mewett (1962a) wrote, in this connection:

If we ignore the individual offender for the moment — one brutal assault does more harm to society than half a dozen large swindles ... If we cannot prevent crimes from being committed, should not the criminologist be spending his time and energy in attempting to reduce the gravity of these crimes which are committed even if it means that the crime « rate » goes up (p. 242).

Indeed, there the author touched the crux of the problem. Even if the value judgment about the relative seriousness of a brutal assault and half a dozen swindles made by Mewett is not shared by all, the fact remains that crime rates mean little by themselves. What is more important is the seriousness of these crimes in terms of the harm they inflict on society. But to be able to make an empirically valid judgment to the effect that one brutal assault is more serious than half a dozen minor assaults, the differential weighting of the gravity of these two offences is necessary and the present system for recording crime statistics fails to incorporate this kind of weighting, based on a scale of relative seriousness, which would make it possible to assign differential numerical values to criminal events according to their relative gravity. Let us now examine concretely why the CUCR is unable to account for the qualitative elements inherent in criminal and delinquent events.

An examination of the CUCR system and instructions for scoring offences known to the police suggests that the system classifies a series of criminal code violations (nineteen classifications) in descending order according to their alleged degree

of seriousness<sup>9</sup>. For example, motor vehicle theft is viewed as more serious than possession of stolen goods, fraud as more serious than carrying offensive weapons, etc., and therefore the former are listed before the latter.

This conception of seriousness, however, proves to be meaningless when the following points are considered<sup>10</sup>:

a) Offences such as arson and kidnapping which can cause considerable physical and material harm are not included in the classification. While the former is tabulated separately, the latter is omitted as a specific category.

b) The nineteenth category of the classification, entitled « Other criminal offences », is a catch-all category which comprises a great variety of offences (not specified by the DBS), ranging from « disturbances » to « wilful damage » to « kidnapping » and some of which may cause more harm than the offences listed as more serious in the preceding eighteen categories. For example, wilful damage, which destroys a property worth \$1 000, is undoubtedly more serious than a theft of \$50. Yet, important facts such as this are lost in the classification.

c) The classification of seriousness is based on the description of the criminal events according to their legal definitions. This method of classification obscures significant qualitative differences among offences placed in different categories as well as among those placed in the same category. For example, seduction under promise of marriage, classified under « Other sexual offences », is viewed as more serious than a robbery in which the victim may lose his life-time savings and require hospitalization for serious injuries inflicted by the robber. By the same token, seduction under promise of marriage is viewed as equally serious as indecent assault on a male or a female, which is also classified under « Other sexual offences ». Furthermore, even when two offences are designated by the same term, these offences may be very significantly different in their seriousness. For example, a juvenile who forces his schoolmate to give him his lunch money by physically intimidating him and an adult who uses strong-arm tactics to force his victim to give him his wallet containing \$500 are both reported as having

9. These instructions are provided at the end of the yearly *Crime Statistics Reports* and also separately in the *Uniform Crime Reporting Manual*, Dominion Bureau of Statistics (1966).

10. Most of these criticisms were formulated also by Wolfgang (1963) and Robison (1966). We have reformulated them here with the appropriate examples drawn from the Canadian Criminal Code.

committed robberies.

d) The CUCR system groups (with the exception of attempted murder) into the same category attempted acts and completed acts. For example, an attempted rape which results in a minor injury (a bruise or a black eye) to the victim is considered as serious as a rape, which may cause considerable physical injury and sometimes prolonged disability. The attempted robbery which causes only a scare in the victim(s) is recorded as equally serious as one during which injury is inflicted and money is stolen. Wilkins (1965), a leading British criminologist, has pointed out that

the matter of intent is important in moral issues, but morals and social costs are not the same thing and should be separated in statistics. The two concepts of what happened and what was intended should happen, should not be compounded in one figure, which serves to illuminate neither the social nor the ethical matters (p. 282).<sup>11</sup>

To buttress further the point raised here, if in city « A » ten attempted robberies and five completed robberies occur and in city « B » the reverse happens, all other things being equal, it would be difficult to deny that the harm being inflicted by the robbers in city « B » is greater than in city « A ». The current recording system hides such differences.

e) The CUCR recording system does not provide a differential weighting for the respective seriousness of the nineteen different offence classifications. A theft of \$50 and a murder

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11. Wilkins (1965) illustrates the necessity of separating the concepts of « attempt » and « intent » from the « effect » of action with the following illustrations:

An area (X) may exist which has exactly (n) criminals who commit (N) offences, and who have the same intent as in another area (Y) also with exactly (n) criminals and (N) offences. But area (X) may suffer less social damage than area (Y) because, say, criminals in area (X) are less competent. By present statistics the number of crimes and criminals in area (X) would be exactly the same as in area (Y) and they could not be distinguished in any way. But clearly appropriate social action in the two areas might be very different. Again, suppose that the lack of social damage in area (X) was due, not to lack of competence of the offenders, but to extra competence of the police force; it would seem that these and similar factors should be revealed rather than hidden by the concept of « intent » (p. 282).

Wolfgang (1963), discussing the attempted acts, stated:

They [attempted and completed acts] could be separately tabulated, for they may serve a useful purpose in some other capacity ... But there are enough difficulties in providing operational definitions simply from observable behavior and completed crimes without mixing the two. These problems should not be compounded by incomplete reporting and police interpretation of intent and attempt (p. 720).

are given the same weight of one unit and therefore appear to be equally serious. Under such a system, then it is impossible to answer a question such as the following: In city « A », during two consecutive years, thefts of under \$50 increased tenfold from one hundred to one thousand while thefts of over \$50 decreased fivefold from five hundred to one hundred; has the seriousness of crime increased, decreased, or has it remained the same? How many thefts over \$50 are equal to how many thefts under \$50? For one thing, we do not even know the actual amount stolen in thefts reported to be over \$50. Was it \$51 or \$51 000? Questions such as this one may be formulated in comparing trends among other offences. The importance of being able to answer such questions is self-evident and need not be belaboured here.

f) The CUCR tabulates composite criminal events (i.e., when more than one offence has been committed simultaneously) under the heading of the most serious component, and thus fails to take into account the total seriousness of a criminal event. The system also fails to reflect significant differences in seriousness among events which are recorded on the basis of the most serious offence common to them. For example, an event during which an offender kills a motorist, rapes his wife and steals money is recorded the same way as that in which a gangster engaged in a gun fight kills one of his rivals and seriously injures another, or when a thief apprehended inside a home kills in a moment of panic the tenant who attempted to apprehend him and sets his house on fire. In all three cases the events are recorded simply as murder.

The inadequacy of the CUCR system in reflecting the seriousness of composite events is further reinforced by the general rule for scoring such events. According to the instructions manual of the CUCR, « the most serious offence is defined as (a) the most serious one as measured by the maximum penalty allowed by the law; (b) the offence which is considered the most serious by the police when the penalties are the same; (c) the offence which appears first in the offence classification ». These guidelines are at best ambiguous and at worst inconsistent and contradictory.

When the seriousness is measured by the maximum penalty allowed by the law for different offences, then, in the view of the framers of the CUCR, attempted murder, robbery, and breaking and entering into a private dwelling, for example,

are all equally serious, as each of the offences carries a maximum sentence of life imprisonment.

A theft of \$1 000 000 from the vaults of a bank at night is considered less serious than the intrusion of a man into a private dwelling through an open window to steal a transistor radio placed near that window. This method leads to some absurd equations of seriousness.

When the second rule of scoring is considered, the determination of seriousness depends on the subjective judgment of the police officer recording the criminal event or that of the police chief who interprets the rules for his officers. For example, when two adults committing sodomy are apprehended in the act by a police officer and the culprits inflict a bruise on the officer who attempts to arrest them, which would be the more serious offence? The answer would seem to depend to a considerable extent on the feelings and attitudes of the officer involved rather than on the objective nature of the offence.

The problem becomes further complicated when the third rule is applied to score this example. According to that rule, the event should be classified under « Other sexual offences », as this category precedes « Wounding ». But what if one officer follows the second rule and feels that assaulting a police officer is more serious than sodomy, while another officer, unable or unwilling to determine the matter by himself, decides to score according to the third rule? We have little knowledge about the extent of agreement among different police forces and even among different officers of the same force on the method of scoring composite events<sup>12</sup>.

To sum up, then, the concept of seriousness as viewed through the CUCR system is nebulous and permits contradictory interpretations<sup>13</sup>. What Professor Edwards (1961) said

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12. The only empirical data on this question are provided by a study conducted in Puerto Rico (see Ferracuti *et al.*, 1962). The study found that a) while the amount of actual errors made in routine reporting is unknown, the data indicated that it was substantial; b) there was a lack of conformity between the ranking assigned by police officers, according to the « seriousness » of the crimes and the maximum length of the sentence. The extent to which these findings can be generalized for Canada is subject to research.

13. It is unfortunate that, despite this state of affairs, the recent *Report of the Department of Justice Committee on Juvenile Delinquency* (1965), which aimed « to inquire into and report upon the nature and extent of the problem of juvenile delinquency », after noting a « lack of a central clearing house for relevant, accurate statistical and other information » (p. 3), and the many shortcomings of the existing statistics, contented itself merely with recommending that the « Dominion Bureau of Statistics should be encouraged to continue its efforts to integrate and improve the



of crime statistics is then, despite the improvements brought about, still applicable today. He wrote: « The reports contain much valuable material but there is all too frequent evidence of the dangers of adducing fallacious conclusions from its compilations » (p. 180-181).

### C. THE PROPOSED SOLUTION

The solutions offered to overcome the conceptual shortcomings of crime statistics in general and those based on the Uniform Crime Reporting system in particular have been many and comprise a variety of methods.

One major idea, however, which has persisted across time and space is the necessity of using a « crime index » as the best way of gauging trends in the seriousness of criminality.

Professor Sellin, a leading contemporary scholar in the field of criminal statistics, wrote as early as 1931:

That a reliable crime index would be of great value is self-evident. Unless we have such an index which faithfully reflects the criminality of an area or a social group, it is impossible to make conclusive studies of the relationship of crime fluctuations or trends to fluctuations and trends of other phenomena, such as changes in the rate of social mobility, changes in the biological composition of social groups, or in their economic or political life. Furthermore, a crime index is necessary in order that the effects of deliberate policies of social reform, particularly in the field of crime treatment or prevention may be gauged (p. 336).

Sellin suggested that such a reliable crime index can be constructed upon

the recorded crime rates of only a few selected offenses which are considered as greatly injurious to social welfare, and at the same time public in nature, and of such kind that they will induce the fullest possible cooperation between the victim or those interested in him, and the agency of law enforcement (p. 339).

The selection of the offences for the index, however, should not be made arbitrarily. Professor Sellin wrote:

accuracy of its various series on crime and delinquency » (p. 283), for the development of statistics, the aim of which the committee members stated was « to make it possible to produce data on the number of juveniles at any or all stages of the administrative process » (p. 11). They thus disregarded totally the question of seriousness of delinquency and one might wonder whether the committee understood the correct meaning of the words « nature » and « extent » within the framework of their mandate.

The construction of a crime index is not completed by merely selecting the rate of a few offenses known to the police over a period of time. This index must be built up on the basis of a knowledge of the legislative history and of the qualitative and quantitative changes in the population in the period or area studied. Furthermore, since the reportability and detectability of crimes are influenced both by the transformation of social attitudes towards criminal behavior and its consequences and by the changes in police efficiency, and since these transformations and changes are likely to create the greatest disturbances in an index constructed on the basis of a long-time series of data, admittedly better for scientific use than shorter series, the research student who constructs and employs the index must be intimately acquainted with the culture and the public administration of the area studied (p. 339).

However, a crime index, based on the use of the traditional legal criteria for classifying crimes, did not appear to provide the kind of sensitive index that was being sought, and this was very ably illustrated by Wolfgang's critical analysis of the *American Uniform Crime Reports*.

Sellin and Wolfgang (1964) rejected the crime index based on legal definitions. They wrote:

The legal label alone is an inadequate designation to show the relative seriousness of an offense [since even] the judges in sentencing offenders guilty of the same crime impose punishments of different kinds and severity, depending on the circumstances of the crime, thereby recognizing qualitative differences among offenses bearing the same designation even when the subjective characteristics of the perpetrators do not influence the sentence. [Thus] the purely formal [legal] classification [was shown not to] yield the information needed for the construction of a sensitive index ... Considering the variety of acts that are given the same label in statistics we must conclude that a classification of offenses using the legal label as the sole identifying trait is bound to disguise much criminality and, therefore, be misleading, even if we were to consider only the relatively serious crimes ... that probably would yield sufficiently large and constant samples of offenses known to the police (p. 41-42).

The authors concluded:

... the present grouping of the offenses by the broad legal labels employed does not provide the best typology of offenses based on an hypothesis of degree of seriousness, not to mention the fact that it does not provide for differential weighting of the classes, nor of the great number

of variants among the offenses included in any single class (p. 85).<sup>14</sup>

Instead they suggested that

the entire problem of accurate legal labels would dissolve ... if we were to ignore them and instead use police descriptions of events to develop a classification of offenses evolved entirely from these descriptions — the manner in which an offense was committed, the nature and the degree of the harm caused by the offense, the kind of victimization involved, and other similar characteristics of the offense, rather than the generic labels used by the law, would then be of importance. We believe that the offense reports prepared by the police in our large cities are or could be made adequate for such a classification and that the result would yield a more accurate basis for measuring serious criminality than we now have (p. 44).

The rejection of the legal labels was, of course, the first step. As MacNaughton-Smith (1965) said: « Of course, delinquency is not a substance like seawater, and devising an instrument to measure it is not a purely technical problem. Decisions, choices, and definitions are required on which there can be no guaranteed agreement » (p. 26).

The conceptual choices were already formulated in the early writings of Sellin and in those of Wolfgang. These conceptual choices, coupled with the modern scaling techniques borrowed from the work of the psychophysicists, led to the construction of the Sellin-Wolfgang index of crime and delinquency. The major purposes for the construction of the index as stated by Sellin and Wolfgang (1964) were:

- 1) to select from multidimensional features of delinquency a single dimension, taking into account the relative gravity or seriousness of delinquent acts;
- 2) to produce an empirical, objectively ascertained set of components of delinquency that would be examined by socially significant groups whose evaluations could be used as a basis for scoring;
- 3) to arrive at a system of weights for delinquency events for use in the construction of an index (p. 236-237).

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14. The origins of this position can be traced to earlier writings of Sellin (1938). Identical positions are found more recently in Wilkins (1963 and 1965) and Kitsuse and Cicourel (1963).

PART TWO  
CHAPTER TWO

MAJOR ASSUMPTIONS  
AND RESEARCH DESIGN

**A. MAJOR ASSUMPTIONS UNDERLYING  
THE SELLIN-WOLFGANG INDEX**

The major assumptions underlying the development of the Sellin-Wolfgang index may be restated<sup>15</sup> as follows:

a) An index of crime and delinquency must be based on a scale of seriousness which reflects community judgments of the relative seriousness of a variety of offences.

b) The index should be constructed on the basis of information about criminal events found in police reports and not according to the legal labels attached to such events.

c) The index should be based on offences against the criminal code and of such nature that the injury they cause will prompt primarily the victim, or some other person, to notify the police of their occurrence.

d) The index should be based on offences with assumed high and constant reportability and only those which inflict bodily harm on a victim and/or involving theft, damage or destruction of property. In other words, excluded from the index are: 1) offences of a consensual and conspiratorial nature, which are more or less accidentally brought to the attention of the police because the participants are usually the only ones to know about these crimes and conceal them, i.e., blackmail abortion, sale of narcotics, etc. The proportion of this type of offence which is recorded is extremely small and, therefore, fluctuations in the size of the recorded sample from time to

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15. These assumptions are stated here with editorial adaptations (Sellin and Wolfgang, 1964, Chapter 8, p. 113-130; and in their *Manual*, 1963), and in light of the empirical results obtained during the original study.

time cannot be assumed to represent corresponding changes in the *real* incidence of these crimes; 2) offences, the discovery of which depends largely upon the level of activity of the police. These offences do not directly affect any person but disturb the public order, the victim being the community at large, e.g., vagrancy, public drunkenness, prostitution, etc. Offences of this type are rarely reported to the police and, consequently, their recording is almost exclusively dependent upon the activity of the police; therefore, fluctuations in the number of these offences known to the police do not uniformly reflect changes in their real frequency; 3) attempted offences which do not actually cause any harm. These are « attempted » or « intended » offences, such as attempted robbery, attempted rape, etc. Offences of this category raise some interesting moral issues, but attempted and completed criminal acts should not be confused, as probable harm should not be confused with actual harm. The index should be designed to record the actual amount of harm sustained by a community and its members and not the harm that might have been inflicted if all the individuals who intended and/or attempted to commit a crime had carried out their intention and/or been successful in their attempts. Furthermore, not all attempts to commit an offence are equally reported; attempts to injure or rob a person have a higher degree of reportability than attempts to commit offences against property, and therefore the number of attempted offences known to the police is not a reliable reflection of all attempts that occur.

e) Factors such as the amount of money involved in the loss or damage, the degree of medical attention given to the victim of the assault, forcible entry and intimidation are sufficiently aggravating elements of criminal events and as such must be assessed and included in the index. On the other hand, seemingly important subsidiary variables such as the specific type of weapon used and the legal or illegal presence of the offender in given premises where theft occurs do not increase the seriousness of criminal acts and thus need not be assessed for construction of the index.

f) The index must be based on a classification and a differential weighting of the seriousness of offences that would be independent of the specific technical, legal labels given to the offences, and must use as the unit of recording the « event » — which refers to « a configuration of objectively observable and describable elements of the law violation(s) » — and not

merely its most serious component as defined in the criminal code.

g) With respect to juvenile delinquency, 1) offences committed by juveniles must be understood to mean offences attributable to them regardless of in what type of court or by what type of procedure they could be adjudicated; 2) the index should be based on offences which would violate the criminal law if the offender were an adult.

h) The magnitude estimation or ratio scale is the most appropriate scale for estimating the relative seriousness of offences, particularly because of the quality of additivity it is assumed to have.

## **B. THE RESEARCH STRATEGY**

In view of the rigorous testing, the quality of the analytic method used and the empirical strength of the assumptions formulated in the original study, we based our research strategy on what can be described as a « minimal replication model ». This model accepts the validity of the findings, interpretation and conclusions drawn by the authors of the original study through the stage where they formulated the fourteen offence descriptions, the scoring of which by various samples produced the elements necessary for the construction of the final index. As such, the major assumptions underlying the original study are also those underlying the replication study. The current research was undertaken following a pilot study in Montreal conducted by Normandeau (1966; see also Akman, Normandeau and Turner, 1966).

## **C. THE RESEARCH PROCEDURES**

### **1. CHOICE OF THE SAMPLE**

In determining the sample, four main problems had to be resolved: a) the choice of subjects; b) the choice of the best sampling method; c) the adequacy of the sample; d) the costs of sampling.

a) The solution for the first problem was provided by Sellin and Wolfgang (1964), whose original index was based essentially on samples of university students. In this connection, they wrote:

The philosophy and the sociology of the criminal law suggest that principal culture themes of legal prescriptions and sanctions come from the middle-class value system. Representatives of this value system legislate and adjudicate. Thus the definition of crime and the administration of criminal justice are institutionalized expressions of the normative structure of the dominant middle-class in American society ... Despite their occasional revolt against authority while part of the teen-age culture, university students like their parents, generally hold the middle-class values embodied in the common law. Avoidance of physical aggression in the form of assaultive behavior, a quasi-sacred respect for property, the importance of using leisure time wholesomely and productively, emphasis upon ambition, etc., are components of the middle-class ethic and are values commonly shared by most university students. Although there is undoubtedly considerable diversity among some value orientations within any large student body, it seems safe to assume much homogeneity regarding attitudes toward crime and especially toward the offenses that logical inference and empirical reference point to as index offenses (p. 249-250).

Undoubtedly with this rationale, other samples could have been chosen. Student groups, however, are easier to obtain and considerably less expensive to test.

Thus, the first problem was resolved by assuming that university students represent an adequate sample as subjects for scaling seriousness. In any event, considering that the research was basically a replication exercise, the student samples had to be chosen, although they need not have constituted the major part of the total sample, as is the case in this research.

b) The second problem was more complex and had to be considered (as did the first, in part) together with the third and fourth problems.

Ideally, the most elegant sampling method would have been to obtain a random sample of all university students in Canada. However, the difficulty of establishing satisfactory criteria for sampling from all of Canada's universities, as well as the exorbitant costs of such an operation in terms of available financial resources, prevented our using this method. We decided, instead, to choose samples from the largest universities in each Province, except in Quebec and New Brunswick, where the presence of important English and French Canadian minorities made it necessary to include more than one university in the sample. In Quebec, in addition to a new sample from the University of

Montreal (and the sample of the pilot study), we included McGill and Laval Universities. In New Brunswick, the University of New Brunswick and Moncton University were chosen. The other institutions were the Universities of British Columbia, Alberta, Saskatchewan (Regina campus), Manitoba (St. John's College), Toronto, Dalhousie, Memorial and St. Dunstan's. Thus, the student sample consisted of thirteen groups of students chosen from the same number of universities.

c) The next step was to determine the size of the sample. After an examination of the latest enrollment figures (1964-1965), made available by the Higher Education Section of the Dominion Bureau of Statistics, we decided that a sample of approximately 2% of the student population of each university would be adequate. In the smaller universities, this criterion created some difficulty, as a 2% sample yielded very small groups. We decided, therefore, to take in each of these universities a minimum sample of one hundred students. In some universities, the sample size fell below the one chosen because of the usual rate of absenteeism, as well as the voluntary nature of participation in the testing. (Hardly any students, except those with conflicting engagements, refused to take part in the testing.) In other universities, the final samples were larger than required due to the fact that two distinct classes were tested and this created surplus students who wanted to participate in the experiment.

d) The final question was how to choose the sample in each university. Since it had been earlier assumed that there is « much homogeneity regarding attitudes toward crime and especially toward the offenses » described in the test booklets, we believed that a sampling of students of any faculty would be satisfactory. We wrote, therefore, to the Chairman of the Sociology Department at each university, asking him to provide us with a list of all the courses in which the majority of undergraduate students would be enrolled. We felt that testing the students of these courses would give us a good cross-section of the student population. The choice of classes to be tested was made on the basis of size, their representativeness of the population being tested, their availability and the travel schedule set up to minimise costs. Basic information about the student sample is summarized in Table 3.

In the choice of samples, we were also interested in examining the meaning of the results found in the original research,



TABLE 3  
Basic information about the student sample \*

Places	Size of sample chosen	Size of sample tested		Total	Courses of classes tested
		Male	Female		
University of British Columbia	310	111	118	229	Introductory Sociology
University of Alberta	200	108	97	205	English
University of Saskatchewan (Regina campus)	175	82	109	191	Introductory Sociology
University of Manitoba (St. John's College)	125	53	66	119	Criminology
University of Toronto	300	82	167	249	English
University of Montreal (1966/French)	225	157	67	224	Letters, Engineering and Pure Science
McGill University	225	114	127	241	Introductory and Advanced Psychology
Laval University (French)	225	212	145	357	Letters and Introductory Sociology
University of Moncton (French)	100	110	—	110	English, Economics and Mathematics
University of New Brunswick	100	55	48	103	English
Dalhousie University	100	55	64	119	Introductory Sociology
St. Dunstan's University	100	80	36	116	English Literature
Memorial University	100	49	72	121	Introductory Sociology and History
Total		1 268	1 116	2 384	

Mean age of men: 20.9; mean age of women: 19.5.

\* The initial report of this research appeared in *The British Journal of Criminology*, April 1967.

where samples of Pennsylvania juvenile court judges and officers of the Philadelphia police force also participated. We decided, therefore, to include in our survey additional sample groups. The first supplementary group consisted of police officers (rank and file) of the Montreal Police Department. That sample comprised one hundred and fifty-one subjects chosen from the three largest police stations in Montreal, which cover both residential and business sections of the city. The police sample is summarized in Table 4. With the exception of six subjects, all officers were French Canadians. The average age of the police officers was thirty-three.

TABLE 4

Basic information about the Montreal police sample

Subjects	N	Length of service
Police cadets	3	4 months
Uniformed	91	7 years
Plain clothes (up to rank of captain)	55	17 years
Others	2	7 years
Total	151	

The second supplementary sample consisted of judges and magistrates chosen randomly across Canada from the latest edition of the *Canadian Law List* (1965). This sample consisted of three hundred and sixty-six English-speaking judges and one hundred and fifty-seven French-speaking judges. Ninety-four subjects of the former group and fifty-seven subjects of the latter group completed and returned the booklets. Three did not participate since they had left the Bench, and twelve replied that they did not wish to participate in the research, as they had strong objections to the research procedures. On the other hand, twenty-eight judges who participated asked for further information about the outcome of the research. Distribution of the second supplementary sample is provided in Table 5. In addition, there were responses from twenty judges whose completed booklets arrived too late to be included in the final sample because of an unfortunate delay in the postal service. The return obtained from the judiciary was normal for mail questionnaires and, more particularly, was satis-

**TABLE 5**  
Basic information about the judicial sample

Provinces	Number of judges	Number of judges in sample	Booklets received
<b>French-speaking judges</b>			
Quebec	130	130	50
New Brunswick	18	18	5
Ontario	6	6	2
Manitoba	3	3	0
Total	157	157	57
<b>English-speaking judges</b>			
Newfoundland	21	21	4
Nova Scotia	37	37	11
Prince Edward Island	8	8	2
New Brunswick	29	29	8
Quebec	9	9	2
Ontario	142	71*	26
Saskatchewan	34	34	10
Manitoba	27	27	7
Alberta	102	51*	12
British Columbia	158	79*	12
Total	567	366	94
Grand total	724	523	151

Mean age of respondents: 65.

\* Each second name chosen.

factory in light of the nature of the test as viewed from a legalistic standpoint<sup>16</sup>.

The third supplementary sample consisted of fifty-two English-speaking white-collar workers (men) in the employ of Canadian Industries Limited (C.I.L.) in Montreal, all of whom held managerial positions. The average age of this group was forty-one.

Attempts were also made to obtain samples of blue-collar workers, but all of the companies approached for this purpose declined to co-operate for economic reasons.

The total sample, then, consisted of two thousand seven hundred and thirty-eight subjects. The final index of crime and delinquency, however, for reasons which will become obvious later, is constructed on the basis of student ratings.

16. For some relevant references for the assessment of the sample obtained by mail, see Clausen and Ford (1947); Goode and Hatt (1952); Mitchell (1939); Robins (1965).

## 2. THE EXPERIMENTAL PROCEDURES

The major part of the testing was conducted by a member of our staff, with particular training in matters relating to testing, who traveled across the country to administer the test.

The Laval, McGill and Montreal university students, the police officers and the white-collar workers were tested by the writers and the sample of Toronto students by Mr. John Hogarth of the Centre of Criminology of that university, following instructions provided by the travelling member of our staff.

The tests were administered in groups and, during the ratings, communication among the subjects was not allowed. Throughout the experiments, especially those conducted at the universities, the subjects took the test seriously. There was a genuine feeling of willingness to co-operate and a seemingly determined effort to do a conscientious job. Following the testing, some students raised a number of questions (these will be discussed later with other issues) and problems relating to the nature and meaning of the research.

The testing took on the average twenty minutes per group. In each experiment, the subjects received a booklet which contained a set of instructions, an example and fourteen offence descriptions, each of which was transcribed on a separate sheet. Before the testing began, the instructions and the example were read aloud to the subjects, and any « leading » questions were answered by repeating the appropriate part of the instructions. The test booklets were available in French and in English, depending on the ethnic origin of the subjects.

The instructions read:

This booklet describes a series of violations of the law; each violation is different. Your task is to show how serious you think each violation is, not what the law says or how the courts might act.

You do this by writing down in a score box on each page a number which shows how serious each violation seems to you. The first violation has been done as an example. It shows a violation which is given a seriousness score of 10. Use this violation as a standard. Every other violation should be scored in relation to this standard violation. For example, if any violation seems twice as serious as the standard violation write in a score of 20. If any violation seems ten times as serious as the standard violation, write in a score of 100. If a violation seems half as serious as the standard, write in a score of 5. If a violation seems

only a twentieth as serious as the standard, write in a score of  $\frac{1}{2}$  or .50. You may use *any* whole or fractional numbers that are greater than zero, no matter how small or large they are just so long as they represent how serious the violation is compared to the standard violation. Please do not write zero or any negative figures (such as -5). Take your time. Every page should have a number in the score box. Do not turn back once you have finished a page. Remember, this is not a test. The important thing is how *you* feel about each violation. Do not write your name on any of the sheets for you will not be identified. However, do not forget to indicate on the front page your age, your sex, your province of residence and your ethnic origin. Thank you.

The standard violation read as follows:

This is the standard violation which is given a seriousness score of 10.

The offender is a male.

The offender steals an unlocked car and abandons but does not damage it.

The fourteen offence descriptions were:

A. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$5.

B. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$20.

C. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$50.

D. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$1 000.

E. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$5 000.

F. An offender *breaks into* a building and with no one else present takes property worth \$5.

G. An offender *without a weapon* threatens to harm a victim unless the victim gives him money. The offender takes the victim's money (\$5) and leaves without harming the victim.

H. An offender *with a weapon* threatens to harm a victim unless the victim gives him money. The offender takes the victim's money (\$5) and leaves without harming the victim.

I. An offender inflicts injury on a victim. The victim *dies* from the injury.

J. An offender inflicts injury on a victim. The victim is treated by a physician and his injuries require him to be hospitalized.

K. An offender inflicts injury on a victim. The victim is treated by a physician but his injuries do not require him to be hospitalized.

L. An offender knocks down a victim. The victim does not require any medical treatment.

M. An offender forces a female to submit to sexual intercourse. No other physical injury is inflicted.

N. An offender takes an automobile which is recovered undamaged.<sup>17</sup>

17. The French booklet read:

Cette brochure décrit une série de violations de la loi; chaque violation est différente. Votre collaboration consiste à indiquer quel degré de gravité vous attribuez à chaque violation, non tel que la loi le mentionne ou tel que les cours de justice le laissent voir.

C'est ainsi que vous écrivez dans la boîte ouverte = qui est imprimée sur chaque page un nombre qui indique le degré de gravité que vous attribuez à chaque violation. La première violation vous est donnée en exemple. Elle indique un degré de gravité de « score 10 ». Employez cette violation comme référence. Chacune des autres violations doit être évaluée en relation avec ce score-étalon. Par exemple, si une violation vous semble deux fois plus grave que la violation-étalon, écrivez 20. Si une violation vous semble dix fois plus grave que la violation-étalon, écrivez 100. Si la violation vous semble deux fois moins grave que l'étalon, écrivez 5. Si une violation ne vous semble qu'un vingtième aussi grave que l'étalon, écrivez  $\frac{1}{2}$  ou .50. Vous pouvez employer n'importe quel entier ou nombre fractionnel qui est plus grand que zéro, aussi petit ou aussi grand que vous le voulez, pourvu qu'il représente le degré de gravité de la violation considérée en comparaison avec la violation-étalon. Mais veuillez ne point employer de chiffres négatifs ou le nombre « zéro ».

Prenez votre temps. Chaque page doit avoir un nombre dans la boîte ouverte au bas de la page. Ne retournez pas voir ce que vous avez écrit, lorsque vous avez tourné la page ou les pages. Rappelez-vous, ce n'est pas un test. Ce qui est important, c'est ce que vous pensez au sujet de chaque violation. N'écrivez pas votre nom sur les feuilles afin de ne pas être identifié. Mais veuillez indiquer votre âge, sexe, province de résidence et origine ethnique, sur la première feuille. Merci.

The standard violation read:

Voici la violation-étalon à laquelle est attaché un score de 10 comme degré de gravité.

La personne est du sexe masculin.

Une personne vole une automobile qui n'est pas sous clef et elle l'abandonne; mais elle ne lui cause aucun dommage.

The fourteen offence descriptions were:

A. *Sans effraction ou sans entrer* dans un établissement, et aucune autre personne n'étant présente, une personne prend un bien qui ne lui appartient pas, d'une valeur de \$5.

B. *Sans effraction ou sans entrer* dans un établissement, et aucune autre personne n'étant présente, une personne prend un bien qui ne lui appartient pas, d'une valeur de \$20.

C. *Sans effraction ou sans entrer* dans un établissement, et aucune autre personne n'étant présente, une personne prend un bien qui ne lui appartient pas, d'une valeur de \$50.

D. *Sans effraction ou sans entrer* dans un établissement, et aucune autre personne n'étant présente, une personne prend un bien qui ne lui appartient pas, d'une valeur de \$1 000.

E. *Sans effraction ou sans entrer* dans un établissement, et aucune autre personne n'étant présente, une personne prend un bien qui ne lui appartient

Each offence was described as having been committed by a « male offender ». Thirteen of the offence descriptions are those formulated by Sellin and Wolfgang and rated both during their study and during the Montreal pilot study. The fourteenth offence (minor assault) is slightly different from the two versions tested during the pilot study, being a combination of them. Each booklet was separately randomized to avoid any bias that a particular ordering might have on the raters. Each offence was judged by all subjects.

### 3. METHOD AND TECHNIQUES

The major objective of Sellin and Wolfgang was to develop a crime and delinquency index which would make it possible to quantify the qualitative components of criminal events in order to measure changes in the seriousness of delinquency. This objective was accomplished by devising a weighting system based on a scale arrived at by having nearly eight hundred persons — police officers, university students in Philadelphia and juvenile court judges in the State of Pennsylvania (assumed to reflect community sentiments) — rate the relative seriousness of one hundred and forty-one offences on a magnitude ratio estimation scale and a category interval scale of seriousness.

The method and techniques used in the research were borrowed from the field of psychophysics and particularly from the work of S.S. Stevens of Harvard University.

The law of psychological magnitudes (also called the

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pas, d'une valeur de \$5 000.

F. Une personne *entre avec effraction* dans un établissement, et aucune autre personne n'étant présente, elle prend un bien qui ne lui appartient pas. d'une valeur de \$5.

G. Une personne *sans arme* d'aucune sorte menace de blesser une victime à moins que la victime ne lui donne de l'argent. La personne prend l'argent de la victime (\$5) et s'en va sans blesser aucunement la victime.

H. Une personne *en possession d'une arme* menace de blesser une victime à moins que la victime ne lui donne de l'argent. La personne prend l'argent de la victime (\$5) et s'en va sans blesser aucunement la victime.

I. Une personne blesse une victime. La victime *meurt* des suites de cette blessure.

J. Une personne blesse une victime. La victime est soignée par un médecin et ses blessures l'obligent à être hospitalisée.

K. Une personne blesse une victime. La victime est soignée par un médecin, mais ses blessures ne l'obligent *pas* à être hospitalisée.

L. Une personne assaille et fait trébucher une victime. La victime n'a besoin d'*aucun* traitement médical.

M. Une personne force une personne du sexe féminin à avoir des relations sexuelles avec elle. Aucune autre blessure physique n'est infligée.

N. Une personne prend une automobile qui est retrouvée sans aucun dommage.

« power law »), enunciated by Stevens states that: equal stimulus ratios produce equal perceptual ratios and the stimulus and perception are connected by a power function; and when the stimulus is increased by a given ratio, the perception of the stimulus also increases by a given ratio. The law is usually stated as follows:

$$Y = aX^b$$

where Y is the perceived magnitude

X is the stimulus

a and b are constants estimated from the data.

Therefore, when subjects were asked to assign scores of relative seriousness to the fourteen offence descriptions, they were given a series of stimuli (the seriousness of the offences); and their estimation of the relative seriousness as expressed by the scores reflects their perception of the magnitude of the stimuli. The resulting magnitude estimation scores constitute a ratio scale<sup>18</sup>.

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18. For a general discussion of the psychophysical methods, see Sellin and Wolfgang (1964, Chapter 15); see also Stevens (1956, 1959 and 1966).



## CHAPTER THREE

# ANALYSIS, FINDINGS AND INTERPRETATION: DERIVING THE CANADIAN INDEX

### A. ANALYSIS AND FINDINGS

#### 1. DESCRIPTION OF THE DATA

The results will be summarized by describing each offence by its average score. The geometric mean<sup>19</sup> and the median<sup>20</sup> are the two types of averages that psychophysicists have used in handling ratio scales. Their use depends upon the nature of the data. Whenever a distribution is highly skewed, i.e., whenever there is a considerable number of extreme cases in one direction or another, then the median will generally be more appropriate than the geometric mean, which is more sensitive to the extreme values. Usually, however, in a vast number of experiments, psychophysicists have found the two types of averages equally meaningful and useful. In the last decade, a deliberate choice was made in favor of the geometric mean because of its robustness and because it can be manipulated more easily. This method of averaging has an added advantage

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19. The geometric mean ( $g$ ) is the  $n$ th root of the product of  $n$  numbers. Usually the following formula is used:

$$\log G = \frac{\sum \log X}{N}$$

This formula indicates that the geometric mean is the arithmetic mean of the logarithms of the scores. The geometric mean has several limitations, namely: a) if any of the scores is zero, the geometric mean is zero; b) if any of the scores is negative, the geometric mean may be meaningless. It is because of these reasons that the subjects were instructed to use only finite, positive numbers. For further information about measures of central tendency, see a standard reference, for example, Croxton and Cowden (1959), *Applied General Statistics*, New York, Prentice-Hall.

20. The median ( $Md$ ) is a number which has the property of having the same number of scores with smaller values as with larger values. Ordinarily, the median divides the scores in half.

in that the different ranges of numbers used by different subjects do not need normalizing prior to averaging. We decided, therefore, to use the geometric mean. However, proceeding further with the analysis, we examined the question of whether the strong invariance between two means, established in psychophysics, was equally valid on our data. When the medians and the geometric means are computed for the magnitude scale scores of the entire student sample on each of the fourteen offences and plotted one against the other log-log paper as in Figure 1 (see Table 6), a strong relationship between the sets of scores is obtained ( $r = 0.96$ ). We thus felt justified in using only the geometric mean scores to pursue our analysis.

TABLE 6

Comparison of the fourteen index offences judged by the Canadian university sample by type of average (geometric means versus medians)

Offences	Geometric means (N = 2384)	Medians (N = 2384)
Larceny \$5	5.44	9.38
Larceny \$20	8.98	12.26
Larceny \$50	11.79	14.22
Larceny \$1 000	26.07	25.22
Larceny \$5 000	34.40	33.50
Burglary \$5	13.12	15.94
Robbery \$5 (no weapon)	19.25	22.39
Robbery \$5 (weapon)	31.12	31.70
Assault (death)	179.20	103.53
Assault (hospitalized)	48.75	51.59
Assault (treated and discharged)	31.78	32.91
Assault (minor)	10.92	15.92
Rape (forcible)	83.43	81.25
Auto theft (recovered, no damage)	10.65	12.79

$$r = 0.96$$

$$b = 1.29$$

## 2. MEN-WOMEN MAGNITUDE SCORES COMPARED

A comparison of the scores given by men and women students is summarized in Table 7 and described in Figure 2.

Magnitude estimation scale scores (geometric means)

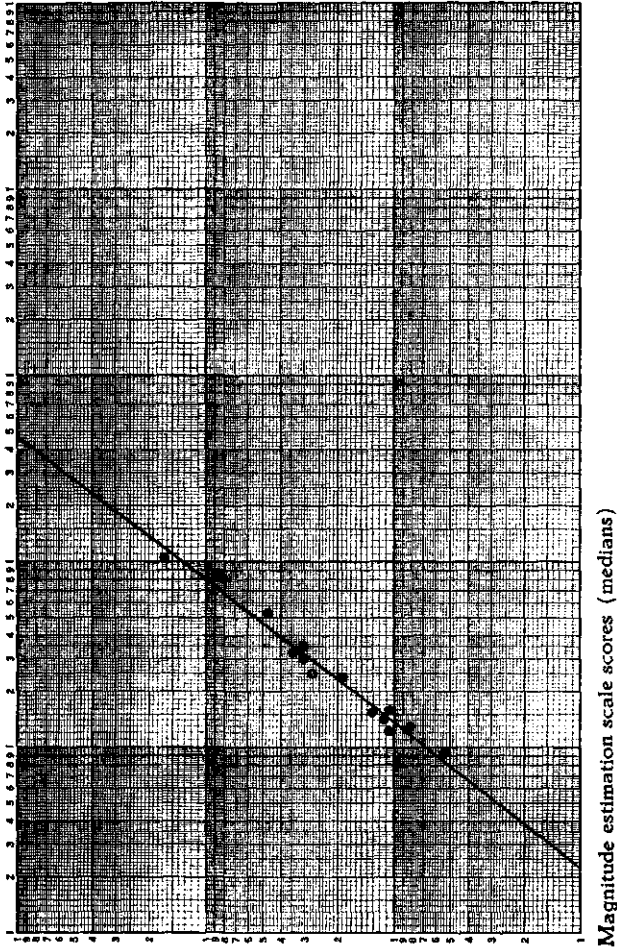


FIGURE 1

Comparison of the fourteen index offences judged by university students in Canada. Magnitude estimation scale scores (geometric means versus medians) plotted on log-log coordinates.

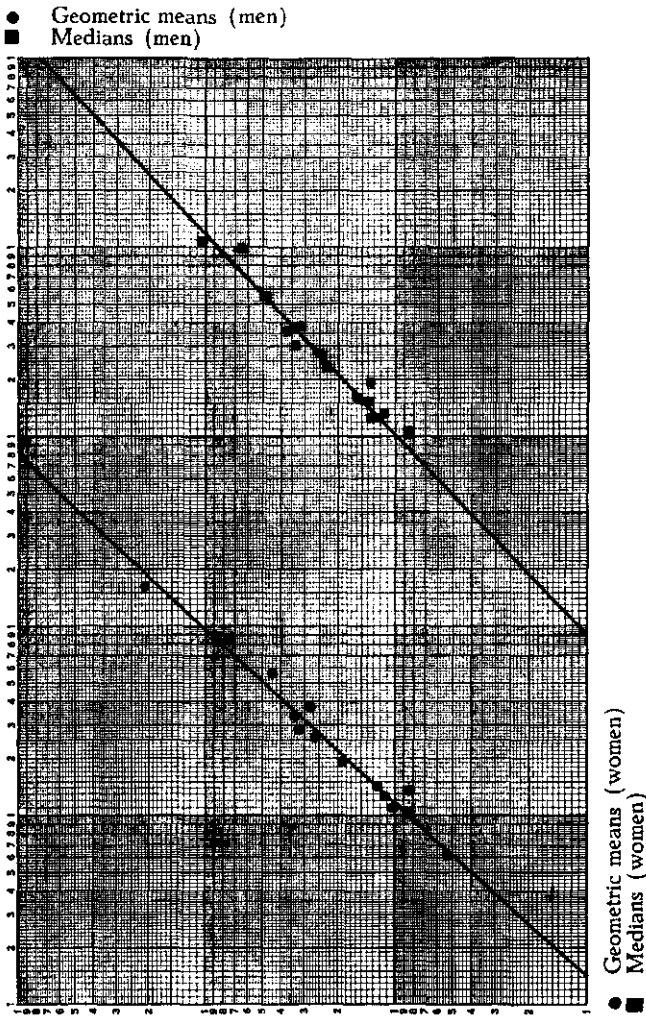


FIGURE 2

Comparison of the fourteen index offences judged by men and women. Magnitude estimation scale scores (geometric means and medians) plotted on log-log coordinates. Values displaced on the abscissa.

TABLE 7

Comparison of the fourteen index offences judged by the Canadian university sample,  
by sex and type of average

Offences	Geometric means		Medians	
	Men (N = 1268)	Women (N = 1116)	Men (N = 1268)	Women (N = 1116)
Larceny \$5	5.06	6.06	8.62	10.29
Larceny \$20	8.65	9.85	11.77	12.73
Larceny \$50	11.41	12.76	13.57	15.01
Larceny \$1 000	26.08	26.79	24.69	27.46
Larceny \$5 000	35.28	33.81	33.07	34.27
Burglary \$5	13.06	13.73	15.88	16.09
Robbery \$5 (no weapon)	19.84	19.21	22.70	22.21
Robbery \$5 (weapon)	33.91	26.73	32.68	30.72
Assault (death)	214.90	154.20	103.67	103.40
Assault (hospitalized)	45.88	52.42	48.85	53.04
Assault (treated and discharged)	29.28	35.33	30.52	36.52
Assault (minor)	8.95	13.53	13.33	19.86
Rape (forcible)	75.23	92.15	64.53	100.09
Auto theft (recovered, no damage)	10.55	11.06	12.73	12.87
		$r = 0.93$ $b = 1.09$		$r = 0.94$ $b = 0.96$

These, with the exception of murder and rape, indicate an overall consensus between men and women subjects. The first difference appears *only* when geometric means are used and can be explained by the fact that men gave a greater number of extreme magnitude estimations to murder. The reason for the second difference seems obvious and needs no further comments.

Some intragroup differences noted between men and women (see Appendices A, B, D and E) and the differential scoring regarding murder and rape cannot be considered serious enough to hinder analysis. We decided, however, to take these differences into account by combining on a 50:50 basis in each student group the scores given by men and women (see Appendix C), that is, by taking the arithmetic mean of the two geometric means for each offence. This procedure appeared logical as the sex ratio in the general population also approximates 50:50.

### 3. THE « NATIONAL » MAGNITUDE SCORES

The next stage involved the derivation of the « national » magnitude scale scores by combining the scores of the thirteen student groups. Two alternative methods were available. The first would compute for each offence the arithmetic mean of the thirteen geometric means corresponding to each student group (see Appendix C, where the men's and women's scores are weighted on a 50:50 basis), i.e., for offence « A »:

$$\text{National magnitude scale score} = \frac{\text{Geo. mean}_1 + \text{Geo. mean}_2 + \dots + \text{Geo. mean}_{13}}{N \text{ (groups)}}$$

This method appeared inadequate, as in two provinces there was more than one group, and more important, this method gave equal weight to the opinion of each group. The second method was to compute for each offence the arithmetic mean of the same geometric means (Appendix C), but weighted on the basis of the percentage of the population (out of the total Canadian population) residing in each province from which the samples were chosen<sup>21</sup>, i.e., for offence « A », the « national » magni-

21. Base figures used in the computations were taken from the 1961 census. In 1961, the total Canadian population was 18 238 247. The percentages of population residing in each province were the following: Prince Edward Island, 0.6; Newfoundland, 2.5; New Brunswick, 3.3; Nova Scotia, 4.1; Manitoba, 5.1; Saskatchewan, 5.2; Alberta, 7.3; British Columbia, 8.9; Quebec, 28.8; Ontario, 34.2.

tude scale score would be equal to <sup>22</sup>

$$\frac{\text{Ontario's Geo. mean} \times \text{Ontario's percentage of the Canadian population} + \dots}{100\%}$$

We decided in favour of the second method on two assumptions: a) that the views expressed by the student groups reflected the overall sentiments and attitudes which embody the dominant cultural values of their respective provinces; b) that a national index must give differential weight to the opinions prevalent in different provinces, as dominant attitudes do not result from the summation of different opinions, but more likely from the pressures exercised by the largest segments of the population.

A comparison of the national scores obtained by these two methods is provided in Table 8. In fact, the almost perfect

TABLE 8  
Comparison of magnitude estimation scale scores  
(geometric means) of Canadian students  
computed by two different methods

Offences	Arithmetic means (13 groups) (A)	Weighted means (10 groups) (B)
Larceny \$5	5.71	5.69
Larceny \$20	9.15	8.85
Larceny \$50	11.88	11.53
Larceny \$1 000	26.42	23.95
Larceny \$5 000	35.63	31.87
Burglary \$5	13.02	12.73
Robbery \$5 (no weapon)	18.95	19.11
Robbery \$5 (weapon)	30.46	29.91
Assault (death)	188.19	196.86
Assault (hospitalized)	47.70	49.06
Assault (treated and discharged)	30.80	32.55
Assault (minor)	11.01	13.90
Rape (forcible)	81.49	84.42
Auto theft (recovered, no damage)	10.56	10.39

$r = 0.99$   
 $b = 1.02$

22. In Quebec, the provincial score (weighted Quebec) was preliminarily obtained by: a) taking the simple arithmetic mean of the geometric mean for each offence, obtained in Laval and Montreal (1966); b) computing

agreement obtained (see Figure 3) between the two sets of scores (both in absolute and relative terms) made the choice of this method purely academic.

## B. INTERPRETATION OF FINDINGS

### 1. MAJOR HYPOTHESIS

The major hypothesis to be examined in this study were provided by Sellin and Wolfgang (1964), who stated the mathematical relationship between their findings and those of any future replication study in the following terms:

It should be remembered that the ratios of score values, not necessarily the absolute numbers have remained stable over the different rating groups used in the present study; and it is this ratio that would be important in further explorations. On the basis of our data, we would hypothesize that these relative offence score values would be preserved. To be more specific, we would hypothesize that in a replication ... the scale values for offences would be represented by (1) a slope not significantly different from those of our study, or minimally (2) a straight line when plotted on log-log paper (p. 322-323).

Let us briefly examine these hypothesis, beginning with the second hypothesis, which is their minimum claim.

The minimum claim of Sellin and Wolfgang is that, when the magnitude scale scores obtained in two different groups are plotted against each other or when the magnitude scale scores of a given group are plotted against those obtained in Philadelphia on log-log paper, the relationship between these sets of scores would be linear. This means that a given ratio change in the first set of scores would be associated with a « fixed » ratio change in the second set; i.e., if the seriousness increases  $X$  times in the first group, it will increase  $Y$  times in the second group. The regression equation  $Y = aX^b$  expresses the nature

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the weighted arithmetic mean of the geometric means of the scores of the English-speaking (McGill) students, and of the French Canadian (Laval, Montreal) students on the basis of the population of the two ethnic groups in the province. These percentages were 81% and 19% for French Canadians and English Canadians respectively. In New Brunswick, the provincial (weighted) score was computed by a procedure similar to that used for Quebec. The percentages of French Canadians and English Canadians (including other minorities) in this province were 35% and 65% respectively. Thus, for example, the national magnitude estimation score for offence « A » is:

$$\text{National « A »} = \frac{A_1 (0.6) + A_2 (2.5) + \dots + A_{10} (34.2)}{100}$$



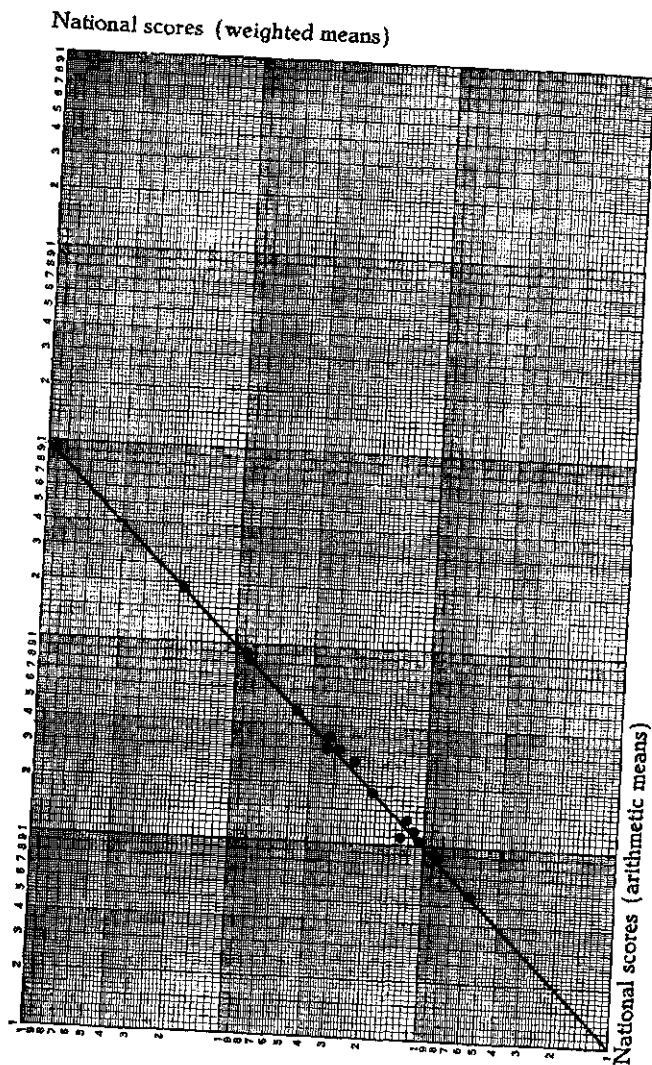


FIGURE 3

Comparison of the fourteen index offences judged by Canadian university students by two types of averages applied to the magnitude estimation scale scores (geometric means) plotted on log-log coordinates.

of the relationship. The strength of the relationship is measured by the Pearson product-moment correlation  $r$  which describes the measure of the goodness of the fit of the least-square line derived from the regression equation. The coefficients of correlation are always below 1, but should be 1 if the relationship were perfect.

The maximum claim of Sellin and Wolfgang is that not only would the relationship be linear, but also that, if the magnitude scores of one group were plotted against those of another group on log-log paper, a given ratio change in one group would correspond to an identical ratio change in the other. It will be recalled that, in the method used, one of the offences is given an arbitrary score of 10 and the relative seriousness of the other offences is expressed in relation to this standard score. It is clear that, when one point is fixed, if a linear relationship is assumed between the two sets of scores, the slope  $b$  of the least-square line, which describes the linear relationship, is the only number needed to compare the ratios of increase in the relative seriousness of the offences. If the two groups agree in their perception of the increase in the ratios of seriousness from one offence to another, then the slope would be 1. If one group (whose scores are plotted on axis  $y$ ) perceives greater increases in the relative seriousness of the offences than the other group (whose scores are plotted on axis  $x$ ), then the slope  $b$  would be greater than 1. If the contrary is true, then the slope would be smaller than 1.

The *similarity of the shape* (expressed by  $r$ ) and the *similarity of the slope* (expressed by  $b$ ) provide the information required to test the hypothesis of Sellin and Wolfgang. The similarities in shape and slope were examined mainly by comparing the magnitude scores (geometric means) of men and women students in each of the thirteen student groups and across the total student sample, each of the student groups with Canada (« national » magnitude scores), the five other groups with Canada, Canada and all the groups (students and others) with Philadelphia. These comparisons are summarized in Table 9.

#### a) *Similarity of shapes*

Sellin and Wolfgang's minimum hypothesis is supported by our data; when the magnitude scores are plotted for the series of comparisons enumerated above, in each case the rela-

TABLE 9

Coefficients of correlation and slopes in major comparisons of magnitude estimation scale scores (geometric means)\*

Sample	A		B		C	
	<i>r</i>	<i>b</i>	<i>r</i>	<i>b</i>	<i>r</i>	<i>b</i>
<i>Student groups:</i>						
Canada (national scores)	0.93	1.09	—	—	0.96	1.11
British Columbia	0.95	1.09	0.97	0.94	0.96	1.01
Alberta	0.97	1.01	0.98	0.93	0.99	1.01
Saskatchewan	0.99	1.03	0.93	0.90	0.98	0.97
Manitoba	0.97	1.09	0.95	1.01	0.98	1.12
Ontario	0.98	0.94	0.98	0.99	0.97	1.07
Quebec (weighted)	—	—	0.91	1.15	0.91	1.21
Quebec (McGill)	0.99	1.25	0.97	1.12	0.99	1.22
Quebec (Montreal/French)	0.99	0.92	0.94	1.36	0.95	1.43
Quebec (Laval/French)	0.90	0.88	0.91	0.89	0.91	0.92
New Brunswick (weighted)	—	—	0.96	0.95	0.97	1.04
New Brunswick (Fredericton)	0.99	1.28	0.96	0.90	0.99	0.99
New Brunswick (Moncton/French)	—	—	0.96	1.03	0.93	1.11
Nova Scotia	0.96	1.16	0.97	0.96	0.98	1.04
Prince Edward Island	0.93	0.77	0.98	1.18	0.94	1.25
Newfoundland	0.94	0.73	0.92	0.80	0.98	0.87
<i>Other groups:</i>						
English judges	—	—	0.98	0.93	0.99	1.02
French judges	—	—	0.91	1.29	0.88	1.36
Police officers (Montreal/French)	—	—	0.97	0.90	0.90	0.97
White-collar workers (English)	—	—	0.97	0.96	0.98	1.07
Quebec (Montreal/pilot/French)	0.94	1.05	0.95	1.35	0.97	1.43

A: Men (*y*) and women (*x*) compared in each student group and the total student sample.  
 B: Each student group and other groups (*y*) compared with the Canada « national » scores (*x*).  
 C: Each student group, other groups and the « national » scores (*y*), compared with Philadelphia (*x*).  
 \* Refer to Appendices A, B and C for the detailed scores used to compute these coefficients of correlation and slopes.

tionship between any of the two groups can be described by a power function of the form  $Y = aX^b$ . This means that plotting the magnitude scores of two groups on log-log paper always produces a straight line (see Table 9, A, B and C). It means, further, that (since a given ratio change in one group is associated with a fixed ratio change in the others) the knowledge of the magnitude score of an offence in one group enables us to predict with considerable accuracy its score in any other group.

The high correlations obtained in the data (all the  $r$ 's are above 0.90) is very impressive when it is recalled that the subjects were not restricted to the use of a « given » set of numbers but were free to respond with any number — whole numbers (small or large), fractions, or decimals — they might choose.

*b) Similarity of slopes*

— The comparisons of the magnitude scale scores of: 1) men and women in each student group and across the total student sample; 2) the thirteen student groups (men and women combined) with the Canadian « national » magnitude scores indicate a powerful invariance. This may be noted in Table 9 (A and B) from the overwhelming cluster of slopes around 1. There are, of course, some differences, particularly between the sexes within the student groups. These differences, however, largely disappear when the magnitude scores of men and women are computed in the total sample. We then obtain a correlation of 0.93 and a slope of 1.09, the disparity being due largely to the facts, mentioned above, that men judge murder relatively more seriously than do women, and women view rape, quite understandably, relatively more seriously than do men.

At this stage, it may be argued that by averaging all the data together important differences are masked. It is our contention, however, that some differences of opinion among various groups must be expected, but that these differences are not significant enough to block the construction of a practical index for Canada; the impressive invariance obtained across the thirteen groups bears testimony to this contention. In fact, what Sellin and Wolfgang (1964) said about their results might be said about ours as well: « A pervasive social agreement about what is serious and what is not appears to emerge and this agreement transcends simple qualitative concordance; it extends

to the estimated numerical degree of seriousness of these offences » (p. 268). This agreement across Canada is well illustrated in Figure 4.

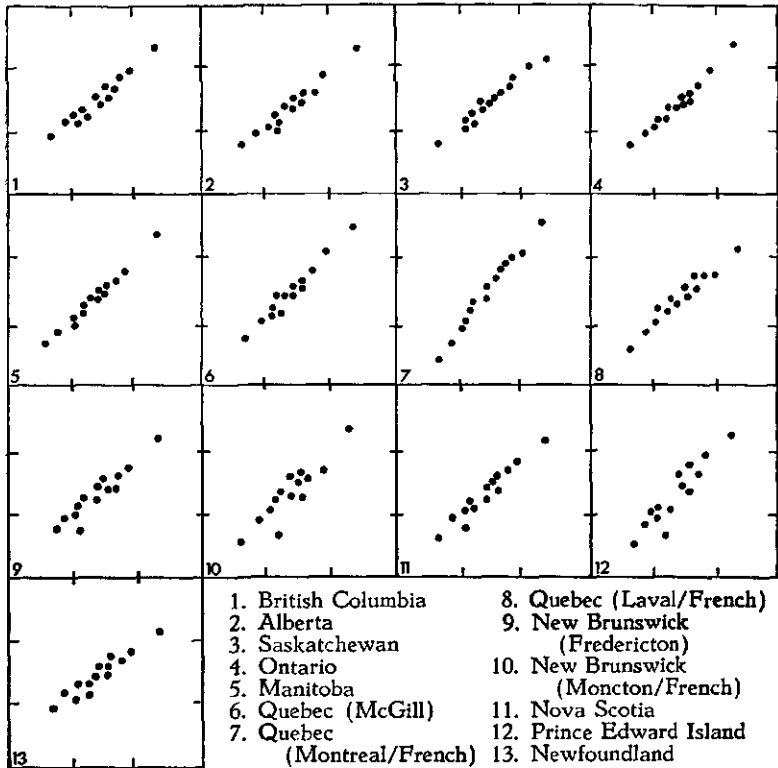


FIGURE 4

Comparison for the fourteen index offences of the « Canadian national » scores displaced on the abscissa ( $X$  axis) with those of each student group ( $Y$  axis). Magnitude estimation scale scores (geometric means) plotted on log-log coordinates.

— The comparison of the magnitude scores of students (« national » scores), judges, police officers and white-collar workers again shows an overall agreement among these groups on the estimation of the relative seriousness of the fourteen offences (Table 9, B).

When the magnitude scores of the judges — French and English — are compared with those of the students, the slope is 1.11. This means that the ratio of increase in seriousness estimated by the two groups is almost identical. For example, while the students estimated forcible rape as being ten times more serious than a car theft, the judges estimated it as being eleven times more serious.

When the judges are grouped by ethnic origin, we find that the English judges express judgments highly similar to those of the students, except that their concern about the increases in seriousness appears to grow slightly slower than that of the students:  $b = 0.93$ . In contrast with the English judges, the French judges express greater concern about increases in seriousness than the students do ( $b = 1.29$ ), i.e., when the students estimated the increase of seriousness from one offence to another as ten times, the French judges estimated it as nearly thirteen times. Strong agreement about the relative seriousness of the offences is found between the students and police officers ( $b = 0.90$ ) and the students and the white-collar workers ( $b = 0.96$ )<sup>23</sup>.

Our findings with respect to the judges, police officers and white-collar workers provide strong support for the rationale underlying the choice of student data in construction of the final index and evidence of the reliability (and, to a certain extent, the validity) of the magnitude estimations made by the students.

— The comparison of the « national » magnitude scores with those obtained in Philadelphia (Table 10) indicates that Canadian students evaluate the increases in the relative seriousness of the offences as being slightly greater than their Philadelphia counterparts, the difference in the estimation being expressed in a  $b$  of 1.11. Actually, the differences between the two groups would have been reduced had there been greater agreement between the two groups about the increases in the relative seriousness of the five money theft offences. Indeed, when the magnitude scores of the two groups are compared only for the nine offences which do not involve theft of money, the slope is 1.06, an almost perfect agreement. On the other hand, when the Canadian magnitude scores for

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23. Sellin and Wolfgang, who tested students, the juvenile court judges of Pennsylvania and the police officers of the Philadelphia Juvenile Aid Division, found comparable strong agreement among the three groups, although their sample of judges was much smaller than the other groups.

TABLE 10

Geometric means of the fourteen index offences judged by students in Canada nationally and in Philadelphia

Offences	Canada national	Philadelphia
Larceny \$5	5.69	22.09
Larceny \$20	8.85	27.77
Larceny \$50	11.53	32.31
Larceny \$1 000	23.95	52.99
Larceny \$5 000	31.87	69.13
Burglary \$5	12.73	40.62
Robbery \$5 (no weapon)	19.11	52.25
Robbery \$5 (weapon)	29.91	86.33
Assault (death)	196.86	449.20
Assault (hospitalized)	49.06	115.60
Assault (treated and discharged)	32.55	69.20
Assault (minor)	13.90	22.50
Rape (forcible)	84.42	186.30
Auto theft (recovered, no damage)	10.39	27.19

$$r = 0.96$$

$$b = 1.11$$

the five money offences are plotted against those of Philadelphia, a slope of 1.25 is obtained, indicating that the seriousness judgment of money offences increases faster in Canada than in Philadelphia (see Figure 5).

On the whole, the detailed differences among the thirteen Canadian student groups and the Philadelphia students are minimal (see Table 9, C)<sup>24</sup>.

— A comparison of the total scores for the ten English-speaking student groups with the total scores of the three French-speaking student groups (Table 11) indicates only small differences between the two Canadian ethnic groups.

24. The comparison between Canada and Philadelphia is subject to two minor limitations: a) the offence descriptions of a minor assault were not completely similar in the original and in the replication study. In Philadelphia, two descriptions (whose scores were pooled in an average) were used; i.e., « An offender shoves or pushes a victim. The victim does not require any medical treatment » and « The offender beats a person with his fists. The victim is hurt but requires no medical treatment ». In Canada, with the exception of the Montreal pilot study (which used these two descriptions), only one description, which combined these two, was used: « An offender knocks down a victim. The victim does not require any medical treatment »; b) the second limitation relates to the fact that only men rated the offences in Philadelphia.

Canadian magnitude estimation scale scores

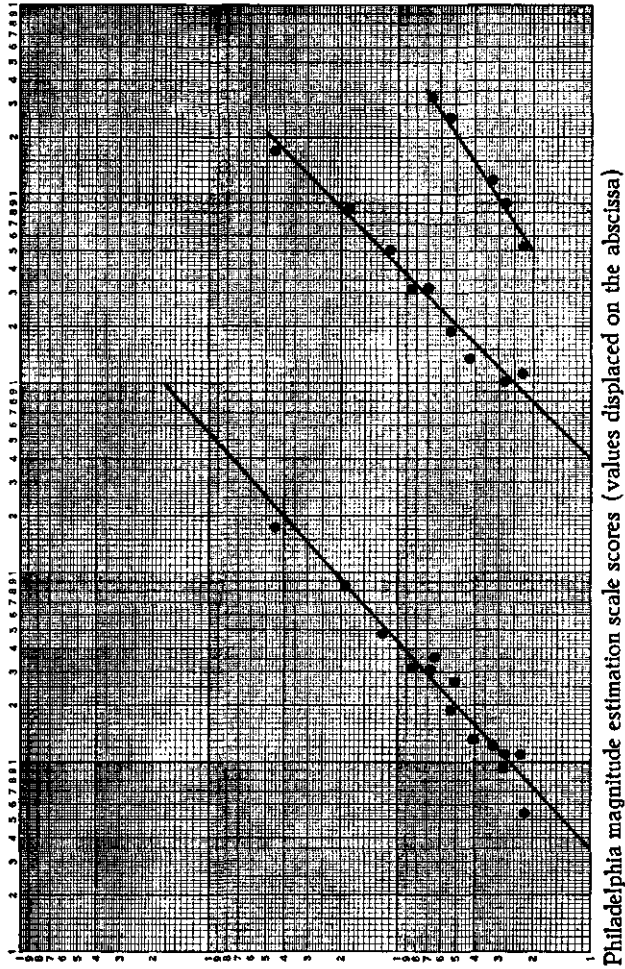


FIGURE 5

Comparison of the fourteen index offences judged by university students in Canada and in Philadelphia. Magnitude estimation scale scores (geometric means) plotted on log-log coordinates.



French

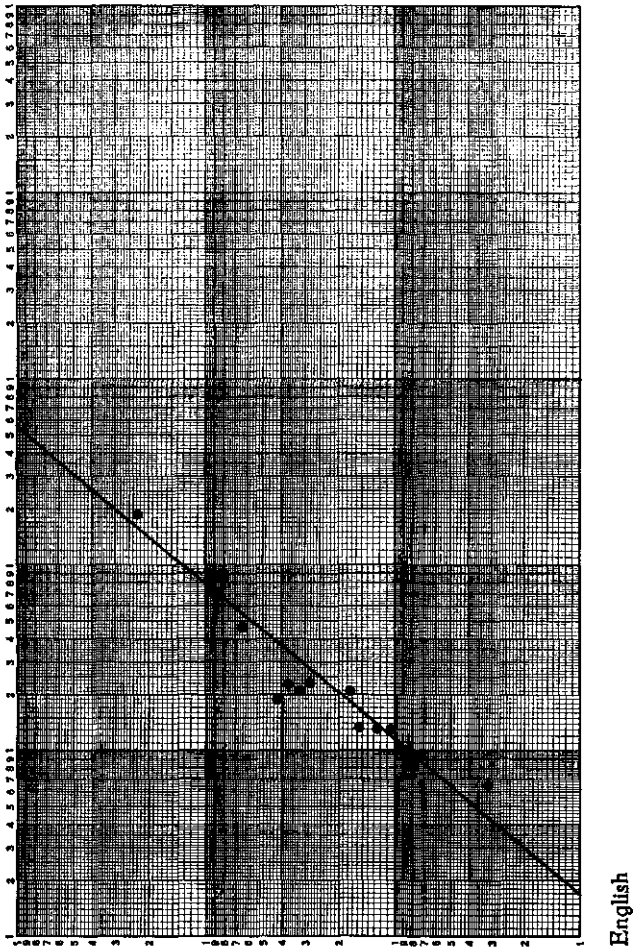


FIGURE 6

Comparison of the fourteen index offences judged by students of both sexes, French and English Canada. Magnitude estimation scale scores (geometric means) plotted on log-log coordinates.

Figure 6 ( $r = 0.95$  and  $b = 1.18$ ) reflects this. From Table 9, it can also be seen that there is no monolithic ethnic consensus in either group; similarities and small differences exist within each ethnic group.

— The comparison of the magnitude scores obtained in Montreal during the pilot study with those obtained in Montreal in this study lends additional confidence in the stability of the scale. The slope of the two sets of magnitude scores, obtained with completely different samples, is 0.99. Furthermore, the high consensus of judgments registered between the men and women during the pilot study is found again, viz.,  $b = 0.92$  in 1966,  $b = 1.05$  in the pilot study. Table 12 and Figure 7 give a clear picture of the situation.

We feel at this point that we are in a position to say that there is sufficient agreement among the different Canadian groups to permit the elaboration of a uniform index derived from the « national » scores. Some readers may argue that before making such a judgment, intergroup differences ought to be tested for statistical significance. A satisfactory statistical test is not available and is not used in the field of psychophysics. Here the major question, in fact, is not whether the differences which appeared among the various groups are statistically significant but whether the overall results indicate a « reasonable agreement ». In this connection, Thomas S. Kuhn (1961) writes:

Scientific practice exhibits no consistently applied or consistently applicable external criterion. « Reasonable agreement » varies from one part of science to another, and within any part of science it varies with time. What to Ptolemy and his immediate successors was reasonable agreement between astronomical theory and observation was to Copernicus incisive evidence that the Ptolemaic system must be wrong. Between the times of Cavendish (1731-1810) and Ramsay (1852-1916), a similar change in accepted chemical criteria for « reasonable agreement » led to the study of the noble gases. These divergences are typical and they are matched by those between contemporary branches of the scientific community. In parts of spectroscopy « reasonable agreement » means agreement in the first six or eight left-hand digits in the numbers of a table of wave lengths. In the theory of solids, by contrast, two-place agreement is often considered very good indeed. Yet there are parts of astronomy in which any search for even so limited an agreement must seem utopian. In the theoretical study of stellar magnitudes agreement to a

## Montreal pilot study (geometric means)

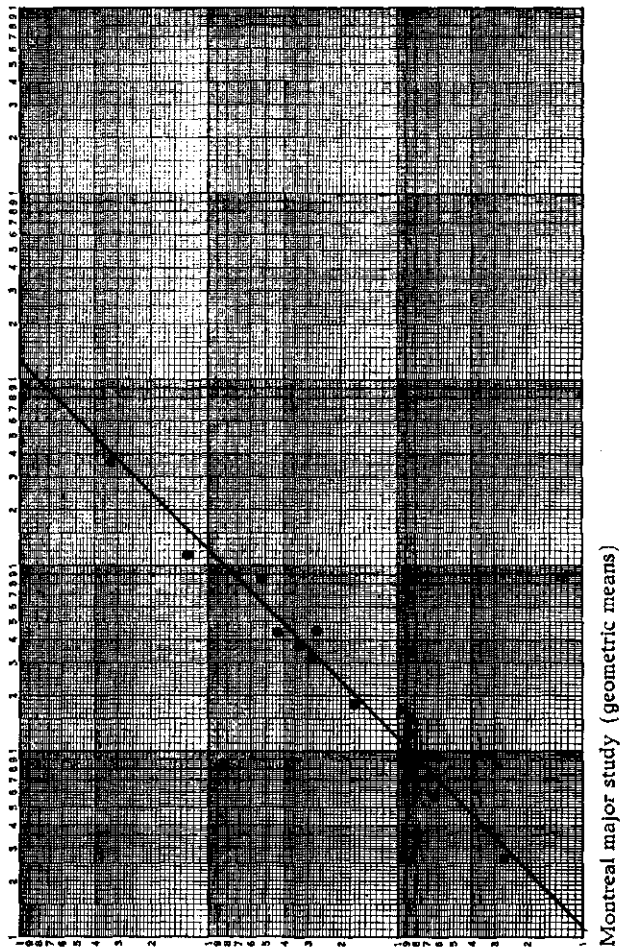


FIGURE 7

Comparison of the fourteen index offences judged by Montreal students of both sexes in the major study and in the pilot study. Magnitude estimation scale scores (geometric means) plotted on log-log coordinates.

TABLE 11

Comparison of geometric means of the fourteen index offences  
judged by Canadian students of both sexes  
by major language groups

Offences	English N=1693	French N=691
Larceny \$5	6.62	3.43
Larceny \$20	9.69	7.19
Larceny \$50	12.21	10.55
Larceny \$1 000	22.76	29.97
Larceny \$5 000	28.99	43.69
Burglary \$5	13.25	12.55
Robbery \$5 (no weapon)	20.36	17.30
Robbery \$5 (weapon)	30.62	31.03
Assault (death)	190.07	238.75
Assault (hospitalized)	46.07	63.43
Assault (treated and discharged)	32.41	36.47
Assault (minor)	13.62	15.70
Rape (forcible)	88.10	83.07
Auto theft (recovered, no damage)	10.93	9.80

$$r = 0.95$$

$$b = 1.18$$

multiplicative factor of ten is often taken to be reasonable (p. 36).

We feel that the impressive invariances exhibited in our data indicates more than « reasonable agreement ». Then, the inescapable conclusion to be drawn from the analysis and interpretation of the data is that the method used in constructing the Sellin-Wolfgang index is highly *reliable* and *stable*. However, on the basis of our analysis of the differences and the similarities of shape and slope, we need to reformulate slightly the minimum and maximum claims made by Sellin and Wolfgang as follows:

*Minimum claim:*

*If the magnitude scale scores of seriousness are derived from any two groups from one or more countries and cultures, the relation between them should be a power function of the form  $Y = aX^b$  (the points plotted should constitute a straight line on log-log paper), it being understood that this applies to*

TABLE 12

Comparison of geometric means of the fourteen index offences judged by Montreal students of both sexes in the major study (1966) and in the pilot study (1964)

Offences	Montreal (major) N = 224	Montreal (pilot) N = 232
Larceny \$5	2.63	2.77
Larceny \$20	5.82	6.44
Larceny \$50	8.64	8.64
Larceny \$1 000	31.00	29.50
Larceny \$5 000	45.20	45.40
Burglary \$5	12.50	8.78
Robbery \$5 (no weapon)	18.20	17.30
Robbery \$5 (weapon)	37.20	34.40
Assault (death)	361.00	333.00
Assault (hospitalized)	88.30	50.10
Assault (treated and discharged)	46.60	26.30
Assault (minor)	15.30	8.86
Rape (forcible)	115.00	132.00
Auto theft (recovered, no damage)	9.59	9.17

 $r = 0.99$ 
 $b = 0.97$ 

offences defined by Sellin and Wolfgang as « index offences ».

*Maximum claim:*

*If the magnitude scores of seriousness are derived from sample groups drawn from the population of one or more countries and cultures, the relation between them should be a power function of the form  $Y = aX^b$  (the points plotted should constitute a straight line on log-log paper), and, as the number of sample groups increases, the majority of the slopes should cluster around 1, it being understood that this applies to offences defined by Sellin and Wolfgang as « index offences ».*

## 2. CONSTRUCTING THE CANADIAN INDEX

The « weighted national » scale scores thus represent an adequate metric of social consensus in Canada of the relative seriousness of the offences scorable by the proposed index.

In order to transform this metric into an efficient system,

the money values (or the power function of money) must be analysed in order to standardize the score values obtained by the score for the smallest offence, i.e., a theft of \$1.

It will be recalled that, among all the offences presented, the raters judged the following five versions of money offences: « Without breaking into or entering a building and with no one else present, an offender takes property worth: \$5, \$20, \$50, \$1 000, \$5 000. » The geometric means of the « national » Canadian scores corresponding to these money offences were: \$5: 5.69; \$20: 8.85; \$50: 11.53; \$1 000: 23.95; \$5 000: 31.87. These values are plotted on log-log paper in Figure 8. The slope of the line gives the exponent of the *power function*. The slope is 0.25 ( $\frac{1}{4}$ ). The power function can be expressed as  $\log Y = 0.613 + 0.250 \log X$ . The interpretation of this slope is different from what has been discussed up to this point. In this instance, we are comparing two different scores, but within the same group, and the slope shows how much more serious the theft of money becomes as the amounts increase. If the slope is less than 1.0, it means that the seriousness judgment does not increase as fast as the amount of money stolen or, in other words, it may be more serious to steal ten dollars than to steal five, but it is not « twice » as serious. In our data, the exponent 0.25 suggests that, in order for a theft to be judged as twice as serious, the amount stolen must be about fifteen times as large. Our results are consistent with the power functions obtained in more than a dozen other experiments made by psychophysicists and, in particular, by Galanter (1962) in his research on the subjective utility of money, wherein he found a slope of 0.4. It is reassuring that the fractional values of the slopes in both cases are consistent with the law of diminishing marginal utility — a law which in the eyes of many has seemed intuitively obvious.

Table 13 shows clearly that such a « law » is applicable to all eighteen groups (and across sexes) of our sample, since all of the power functions of money  $b$  are between 0.16 and 0.49. Philadelphia's power function of money was 0.17.

In practical terms, the power function ( $\log Y = 0.613 + 0.250 \log X$ ) gives us the value for a theft of \$1, i.e.,  $\log 0.613 = 4.11$ . The scale scores derived from the « weighted national » sample for the fourteen index offences, as well as from the scores for a larceny of \$1 and for three additional items which have

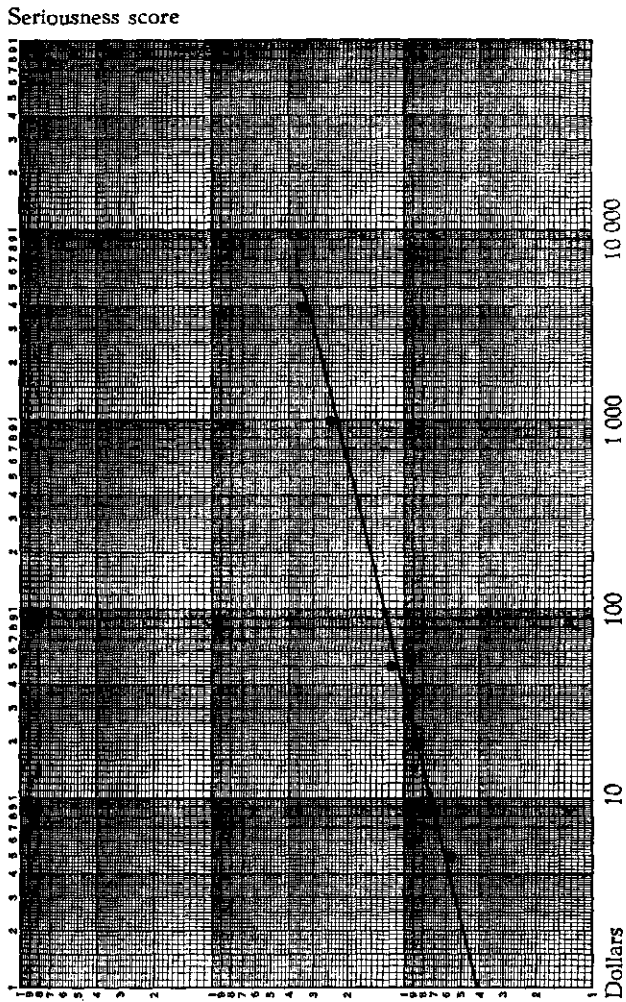


FIGURE 8

Power function of money. The relation between magnitude estimation scale scores (geometric means) and dollar value of thefts.

TABLE 13

Power function of five money offences  
 judged by Canadian students of both sexes in each province,  
 and by other special groups

Sample	Men	Women	Men and women together
<i>Students :</i>			
Canada national	0.24	0.26	0.25
British Columbia	0.16	0.20	0.18
Alberta	0.20	0.25	0.23
Saskatchewan	0.23	0.25	0.24
Manitoba	0.19	0.23	0.21
Ontario	0.20	0.21	0.21
Quebec (McGill)	0.25	0.22	0.24
Quebec (Montreal)	0.40	0.43	0.41
Quebec (Laval)	0.32	0.32	0.32
New Brunswick (Fredericton)	0.23	0.20	0.22
Nova Scotia	0.19	0.26	0.23
Prince Edward Island	0.35	0.42	0.39
Newfoundland	0.18	0.30	0.24
New Brunswick (Moncton)	0.36	—	—
<i>Other special groups :</i>			
Judges (French)	0.49	—	—
Judges (English)	0.26	—	—
Police (Montreal/French)	0.18	—	—
White-collar workers	0.17	—	—
Quebec (Montreal/pilot)	0.36	0.43	0.40
Philadelphia	0.17	—	—

been isolated for special rating on the basis of the assumption of additivity (i.e., forcible entry, verbal intimidation and intimidation by weapon) appear in Table 14 (Stage I). Stage II, in Table 14, gives these scores (as weights) after dividing each score by that of the offence with the smallest score; namely, by using the estimated score for a theft of \$1 (4.11) as the divisor. This standardization preserves the ratios between the offences. However, the scores thus obtained can be reduced further. Since the first nine offences, in Table 14, are needed only to compute other final scores and do not appear as such in the final score sheet, the score for « forcible entry » (1.71) is the smallest among the remaining index offences and the further reduction is effected by dividing each of the scores by 1.71. The column labelled Stage III, in Table 14, gives the new rounded scale scores. Decimals are eliminated at this stage be-



TABLE 14  
 Transformations of the geometric means of the weighted Canadian national scale scores  
 and comparison of the Canadian and Philadelphia scores

Offences	Stage I (Geo. means)	Stage II ( $\frac{\text{Geo. mean}}{4.11}$ )	Stage III ( $\frac{\text{Geo. mean}}{1.71}$ (rounded))	Philadelphia
(a) Larceny \$1	4.11	1.00	1	1
Larceny \$5	5.69	1.38	1	1
Larceny \$20	8.85	2.15	1	2
Larceny \$50	11.53	2.81	2	2
Larceny \$1 000	23.95	5.83	3	3
Larceny \$5 000	31.87	7.75	5	4
(b) Burglary \$5	12.73	3.10	2	2
(c) Robbery \$5 (no weapon)	19.11	4.65	3	3
(d) Robbery \$5 (weapon)	29.91	7.28	4	5
Assault (death)	196.86	47.90	28	26
Assault (hospitalized)	49.06	11.94	7	7
Assault (treated and discharged)	32.55	7.92	5	4
Assault (minor)	13.90	3.38	2	1
(e) Rape (forcible)	84.42	20.54	12	11
Auto theft (no damage)	10.39	2.53	2	2
(f) Forcible entry	7.04	1.71	1	1
(g) Intimidation (verbal)	13.42	3.27	2	2
(h) Intimidation (weapon)	24.22	5.89	3	4

(a) Derived from analysis of money values.

(b) Burglary \$5 has a score of 2, which includes a score of 1 for the money value and a score of 1 for the forcible entry.

(c) Robbery \$5 (no weapon) has a score of 3, which includes a score of 1 for the money value and a score of 2 for verbal intimidation.

(d) Robbery \$5 (weapon) has a score of 4, which includes a score of 1 for the money value and a score of 3 for intimidation (weapon).

(e) Rape (forcible) has a score of 12, which includes a basic score of 8 for the forced sex act, a score of 2 for intimidation (verbal) and a score of 2 for the physical injury (minor).

(f) The score for forcible entry (7.04) is the result of larceny \$5 (5.69) subtracted from burglary \$5 (12.73). Assumption of additivity.

(g) The score for intimidation (verbal) (13.42) is a result of larceny \$5 (5.69) subtracted from robbery \$5 (no weapon) (19.11). Assumption of additivity.

(h) The score for intimidation (weapon) (24.22) may be seen as the result of larceny \$5 (5.69) subtracted from robbery \$5 (weapon) (29.91). Assumption of additivity.

cause they would provide at best only unwarranted precision and reduce functional simplicity. The last column permits comparison of the Canadian scores with the final Philadelphia scores. It is of interest to note that the Canadian scale is nearly identical to the one originally constructed by Sellin and Wolfgang on the basis of their American sample.

At this point, one additional set of data is necessary. These data relate to the final index scores attached to categories of dollars for property stolen, damaged or destroyed. The analysis by intrapolations and extrapolations of the regression equation of the power function of money values, described above, yields the different categories of money related to specific scores or weights of seriousness (with the standardization by division by 4.11 and 1.71 and adjustment by rounding) for theft or damage of property (see bottom of Table 15), and provides the remaining elements which will be used for indexing.

We have used a score of 13 for the amount of property theft or damage involving anything over \$200 000, but should scores for higher categories be desired, these could readily be computed from the equation stated above <sup>25</sup>.

The final scale allows us to evaluate the degree of seriousness of an event, isolate its components and give them each weights, which when added together provide the total seriousness of a criminal event. As Sellin and Wolfgang (1964) remark: « These weights, then, constitute the final result of our search for a means to escape the traditional scheme of treating all delinquent acts as if they were equal and for pro-

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25. The upper dollar limit for each of the score values was as follows:

Upper dollar limit	Score
40.15	1
156.00	2
964.50	3
3 366.66	4
5 572.50	5
13 066.00	6
26 375.00	7
48 000.00	8
62 760.00	9
102 335.00	10
158 325.00	11
193 855.00	12
234 700.00	13

The lower and upper limits used in the scoring system are the adjustments from rounding. The « real » score limit corresponding to an upper dollar limit is 1.5, 2.5, 3.5, etc.

viding a sociologically and mathematically more meaningful way of measuring the amount of delinquency [and crime] » (p. 291).

In the next chapter, how data available on criminal events may be used for the construction of an index of criminality and delinquency will be explained.

## CHAPTER FOUR

# CONSTRUCTING A CRIME AND DELINQUENCY INDEX

The method for constructing the proposed index has already been described in a *Manual* (Akman and Normandeau, 1966) bearing that title. For the purposes of this monograph, we are reproducing in this chapter only the relevant sections; however, the *Manual* can be separately obtained<sup>26</sup>.

### A. « EVENTS » OF CRIME AND DELINQUENCY ARE BASIC UNITS

Police officials now accustomed to using the CUCR system of classifying and scoring offences are well aware of some of the consequences of following its directives for statistical reporting. One illustration will suffice. Suppose that a hold-up man robs in a gas station, kills the attendant, injures a bystander seriously, steals several hundred dollars from the cash register and drives away in a bystander's car; suppose further that in another part of the city, during a fight, an assailant kills someone — each of these cases now is classified and each scored as one murder. This procedure gives an equal « value » to these two occurrences, although no one would deny that they are significantly different and that the first one is much more serious, since not only is one person killed but also another is injured and a great deal of money and a motor vehicle are stolen. The present practice of statistical reporting knows no way of

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26. The *Manual* is available free of charge from the Department of Criminology, University of Montreal. It is a revised and enlarged version of the original *Manual* published by Sellin and Wolfgang (1963). We wish to express our appreciation to them for allowing us to make free use of their *Manual*.

dealing with such a complex *event*. A way must be found to classify and to score an event in its totality and not merely its most serious component. The event should be the unit scored for index purposes. All its pertinent *elements* should be evaluated. These elements are either distinct criminal offences contained in the event or factors which aggravate it; they will be discussed in more detail later, when the method of scoring them is presented.

#### 1. WHAT IS AN EVENT ?

An event is an occurrence which: a) causes its being reported to the police by one or more different persons and, when investigated by the police, is found to contain at least one violation of the criminal law; b) is discovered, directly or indirectly, by the police during patrol and found to contain at least one such violation. If the event contains the elements that cause it to be classified for use in the construction of an index, it becomes the unit to be analyzed and scored. The elements that can be classified for use in this index are discussed below.

Generally speaking, an event is the occurrence described in a report or reports of its investigation by the police and given an individual identification number, such as a central complaint number, a police district number or some similar device. Most events are, in fact, of this nature. Their classification and scoring present no particular problem.

Some events, however, are different. For instance, if one involves injuries to more than one victim — such as when two girls are raped on the same occasion, or three persons are assaulted by the same assailants during an occurrence — complaints from these different victims to the police may be given different identification numbers and become the object of separate investigation reports. These reports may be nearly identical, each containing all the information needed for classifying and scoring the total event. Cross-referencing then becomes necessary in order to permit the scorer to consolidate the different reports pertaining to the event and to avoid scoring it two or three times, which would incorrectly increase both the statistics of the *number* of events and the score values that enter into the index.

The above conception of an event is an operational one. As such it is vulnerable, since it depends on police practice

which is subject to change. So long as this practice remains unchanged in a community, the index will not be affected, but unless the same practice is followed by the police in other communities, intercommunity comparisons will not be completely accurate. A completely logical and universally applicable definition of an event is difficult to formulate. The instructions given later for the classification and scoring of events have been designed to secure the greatest possible comparability.

## 2. CLASSIFICATION OF EVENTS

In order to permit the construction of sub-indexes of delinquency for comparative use, events should be classified according to the effects they produce. An event may involve: a) *only* personal injury to a victim or victims; b) *only* the theft of some property; c) *only* property damage; but personal injury may be associated with theft or damage or both, and theft may be associated with damage. Therefore, note should be taken of these combinations, because it may be considered desirable to compute separate indexes for events involving I (personal injury); I and T (theft); I and D (damage); I, T and D; T; T and D; D. Other combinations are also possible, such as all events involving I; T but not I; D, but not I and T.

## B. THE SCORING SYSTEM

### 1. INFORMATION NEEDED FOR SCORING EVENTS

In order to score the events, the following items, in so far as they are applicable to a given event, must be collected and recorded by the police during investigation (see Table 15).

a) The number of victims who, during the event, receive minor bodily injuries or are physically intimidated, are treated and discharged, hospitalized or killed.

b) The number of victims of acts of forcible sexual intercourse and the number of such victims who are compelled to participate in the act by threats with a dangerous weapon.

c) The presence of verbal intimidation or intimidation by a dangerous weapon of persons during events other than those in which forcible sexual acts occur.

d) The number of premises forcibly entered.

e) The number of motor vehicles stolen.

f) The total amount of property loss during an event through theft, damage or destruction.

TABLE 15  
The system illustrated

*The scoring system can best be described by a form which contains all the elements that are scoreable and which is clarified by definitions of these elements and illustrated by the method of scoring.*

## SCORE SHEET

Identification number (s)

Effects of event: I T D (circle one or more as required)

Elements scored (1)	Number × Weight (2)	Weight (3)	Total (4)
I. Number of victims of bodily harm			
(a) receiving minor injuries or physical intimidation		2	
(b) treated and discharged		5	
(c) hospitalized		7	
(d) killed		28	
II. Number of victims of forcible sexual intercourse		10	
(a) number of such victims intimidated by weapon		1	
III. Intimidation (except II above)			
(a) verbal only		2	
(b) by weapon		3	
IV. Number of premises forcibly entered		1	
V. Number of motor vehicles stolen		2	
VI. Value of property stolen, damaged, or destroyed (in dollars)			
(a) under \$50		1	
(b) \$50 - \$150		2	
(c) \$151 - \$975		3	
(d) \$976 - \$3 250		4	
(e) \$3 251 - \$5 500		5	
(f) \$5 501 - \$12 500		6	
(g) \$12 501 - \$27 250		7	
(h) \$27 251 - \$47 500		8	
(i) \$47 501 - \$62 500		9	
(j) \$62 501 - \$100 000		10	
(k) \$100 001 - \$150 000		11	
(l) \$150 001 - \$200 000		12	
(m) over \$200 000		13	
Total score			

The only events that, so far as an index of crime and delinquency is concerned, need to be considered are those in which some personal victim receives bodily harm and/or in

which property theft, damage or destruction actually occurs.

Each police agency wishing to use this system for developing a crime and delinquency index for its city can determine the best way of recording the needed information. Presumably, the investigation report of an event will be furnished with a face sheet calling for the entry of various items of information, some of which are routinely used for the compilation of the statistical data. *What is important is that all the information needed for scoring be entered on the same sheet or in the same folder in such a way that it becomes easily accessible to the scorer of the event. No event can be scored, of course, until all pertinent information required for scoring it has been secured and recorded.*

To facilitate the task of analyzing the yearly returns, it is suggested that the following information be recorded on the score sheets used for scoring each event:

— Number of offenders.

— Age of the offenders.

— Type of victimization: a) *Primary*, when the event involves the loss or damage of property belonging to individuals (burglary of homes, car thefts, etc.); b) *Secondary*, when the event involves the loss or damage of property belonging to private concerns such as department stores or business offices (shoplifting, burglarizing a store, etc.); c) *Tertiary*, when the event involves the loss and/or damage of property belonging to the community at large (breaking and stealing from parking meters, stealing equipment from a public recreation center, etc.); d) *Face-to-face*, when the event involves personal injury and/or theft and/or property damage (robbery, assaults, etc.); e) *Mutual*, when the event involves injuries (and sometimes loss and damage of property) as a result of a gang fight.

— Census tract (and police district if required) where the event occurred.

Of course, the list of items suggested above is by no means exhaustive and the additional recorded information will vary with the particular kinds of data which the individual police departments (alone or in collaboration with crime control and prevention agencies) may be interested in obtaining.

In order to facilitate the reading of the following pages, we have reproduced below the score values derived through the research as shown in the preceding chapter.



## 2. IDENTIFICATION NUMBER(S)

This is the number which is given to a particular event. It may be a central complaint number, a district number or some other number. If the same event is represented by more than one such number, all the numbers should be recorded so that the event can be scored as a whole. In most cases, an event will be described in complaint and investigation reports carrying but one identifying number. In some cases, however, one event may become the subject of reports with different numbers or two or more such reports describing the same event. If, for instance, in a rape event with two victims, each victim gives rise to a separate report on the event, it would be necessary to coordinate the two reports before the event is scored or it might incorrectly be scored twice.

## 3. EFFECTS OF EVENT AND METHOD OF SCORING

Circle the appropriate letter or letters (I, T, D). Below the two items just noted, the score sheet is divided into four columns. Column 1 contains a list of the elements that can be scored, even though most events will include only one or two of these elements and column 2, the number of instances a particular element occurs in an event. Column 3 gives the weight assigned to the element. Column 4 is reserved for the total score of a given element; this is arrived at by multiplying the figure in column 2 by the figure in column 3. By adding all figures in column 4, the total score for the event is found.

I. *Number of persons injured.* Each victim receiving some bodily injury during an event must be accounted for. If there are three victims and one suffers a minor injury and two have to be hospitalized, write 1 in column 2 opposite I(a) and 2 opposite I(c). Physical injuries usually occur during assaultive events but they may be a by-product of other events — reckless driving, for instance.

I(a) *Minor injury or physical intimidation.* Minor injury is one that requires or receives no professional medical attention. The victim may, for instance, be pushed, knocked down, be mildly wounded — minor cut, black eye or bruise. Physical intimidation means the use of strong arm tactics, physical restraint by pinioning arms which leads to minor injury as defined above.

I(b) *Treated and discharged.* The victim receives professional medical treatment but is not detained for prolonged or further care.

I(c) *Hospitalized*. The victim requires in-patient care in a medical institution, regardless of its duration, or out-patient care during three or more clinical visits.

I(d) *Killed*. The victim dies of his injuries, regardless of the circumstances in which they were inflicted.

*Note*. An event resulting in bodily harm may also present other elements listed under sections IV, V and VI on the score sheet and either under II or III. *All* elements of the event must be scored. The injury, for instance, may have occurred during a rape or a robbery, when intimidation is always present, and may have followed upon a forcible entry to a building and have been accompanied by theft of a motor vehicle or other property of specific value.

The injunction regarding the scoring of all elements of an event applies not only to those resulting in bodily harm but to all events.

II. *Sexual intercourse by force (rape)*. This occurs when a person is intimidated and forced against his will in a sexual act. An event may have more than one victim and the score of the event depends on the number of victims. A continuous relationship such as may occur in forcible incest between step-parents and children and vice versa, is to be counted as one event. The number of victims is entered in column 2 opposite II. A forcible sex act is accomplished by intimidation. The weight attached to the act includes the element of verbal intimidation, but if a victim is forced to engage in the sexual act under threat with a dangerous weapon (see III below), additional weight is given to the act. Intimidation by weapon is scored only once for each person intimidated during the event of a forcible sexual act. If only one is intimidated by weapon, write 1 in column 2 opposite II(a); if more than one person is intimidated in that manner, write in the proper number.

The victim of one or more forcible sexual acts during an event is always assumed to have been physically intimidated and therefore to have sustained at least a minor injury. Even when medical examination does not reveal injuries, write 1 in column 2 opposite I(a). This score of 1 should also be given if the victim is examined by a physician *only* in order to ascertain if venereal infection has occurred or for prophylactic reasons.

III. *Intimidation of person(s)* (other than in I and II above). This is an element in all events in which one or more

victims are threatened with bodily harm or some other serious consequence for the purpose of forcing the victim(s) to obey the demands of the offender(s) to give up something of value, to assist in an event that leads to someone's bodily injury and/or property theft, damage or destruction, or to witness such an act. Robbery is the classical example. Intimidation is scored but once in these events regardless of the number of victims or the number of offenders. Ordinary assaults, wounding by inflicting bodily harm, and homicide are not to be scored for intimidation.

III(a) *Verbal intimidation*. Verbal intimidation means spoken threats, threats with fists, menacing gestures, not overtly supported by the display of a weapon.

III(b) *Intimidation by weapon*. Display of weapon, such as firearms, a cutting or stabbing instrument, or a blunt instrument capable of inflicting serious injury.

Write 1 in column 2 opposite III(a) or III(b). If both kinds of intimidation occur, score only III(b).

IV. *Number of premises entered forcibly*. As here used, forcible entry means the unlawful entry, even when not by « breaking » of a premise of a private character to which the public does not have free access, or the breaking and entering of a premise to which the public ordinarily has free access. The methods of scoring this event are discussed separately in the sections concerning the delinquency and crime indexes.

Usually only one distinct premise will be entered, such as a family dwelling, an apartment or a suite of offices, but some events may embrace several such entries. The scoring depends on *the number of premises forcibly entered during the event and occupied or belonging to different owners, tenants or lessees*.

Each hotel room, motel or lodging house room broken into and occupied by different tenants should be scored. If a building was forcibly entered and further entries made inside, the total number of entries scored should include the forcible entry of the building even when the building belongs to someone who is victimized by a further entry inside. Write the appropriate number in column 2 opposite IV.

V. *Number of motor vehicles stolen*. Enter in column 2 opposite V the number of motor vehicles stolen during an event. Usually there will be one only, but there may be several if a garage is broken into and more than one vehicle is stolen, for

instance.

By motor vehicle is meant any self-propelled vehicle — automobile, motorcycle, truck, tractor. Self-propelled lawn mowers and similar domestic instruments are not considered motor vehicles. The value of these is scored under section VI.

VI. *Value of property stolen, damaged or destroyed.* Regardless of the kind of event scored and the number of victims, find the *total value* of all property stolen, damaged or destroyed during the event, whether or not the loss is covered by insurance. Write 1 in column 2 opposite the proper bracket in VI (a-m).

Motor vehicle thefts require special handling. If the vehicle is recovered undamaged and nothing is stolen from it, *there is no loss to be scored*. The theft itself has already been given a weight of 2 under V. If not recovered, the loss — the value of the vehicle and contents — is scored *in addition* to the score given to the theft itself. If it is recovered damaged and/or property has been taken from it, the loss is the sum of the cost of the damage and the value of the stolen articles. Before scoring, the amount of loss should be added to the value of other property values lost during the event, if more than the vehicle and its contents were taken.

## ADDENDA

### 1. GANG FIGHTS

In the preceding pages, it was stated that criminal events of a consensual nature are not useful for a crime and delinquency index and therefore were not scoreable. In the proposed system, however, one such type of criminal event is excluded from this general statement, i.e., gang fights.

The reasons outlined above for the exclusion of consensual acts from the index are not applicable to gang fights. These events generally occur in public, are reported by the public to the police or are spotted by the police in the course of patrol duties. Even though individual members of the gangs involved in the fights may not report the injuries which they may sustain in the course of fighting, these injuries from the community viewpoint are considered serious and therefore must be recorded.

In cases where investigation by the police does not indicate which gang member(s) is the « offender(s) » then the

event should be handled by scoring each injury and (whenever applicable) loss or damage of personal property sustained by each gang member. If six individuals are involved in a gang fight and each of them sustains minor injury, then the score for this event is the total sum of the scores given for each minor injury (i.e.,  $6 \times 2 = 12$ ).

When the investigation report clearly distinguishes the offenders from the victims, then only the injuries and (whenever applicable) loss or damage of personal property of the victim(s) should be scored.

In both instances, the value of damage of the clothes worn by the gang members should not be scored.

## 2. EVENTS INVOLVING MULTIPLE OFFENDERS

In events where more than one offender is involved, such as in a bank hold-up, a burglary committed by two burglars, a victim assaulted and raped by two persons, the amount of personal injury sustained by the victim(s) and the loss or damage of property should be scored only once, and not for each offender involved in the event. If, for example, two burglars enter a house through an open window and steal \$200, then the score for this event is the summation of the score given to forcible entry plus the score given to a theft of \$200. In this case, the total score of the event would be 4.

## C. CLASSIFYING AND SCORING EVENTS

Illustrations of how the proposed scoring system works are given below for the purpose of showing how it differs from the CUCR system. The symbols in the column headed « Element » refer to the items as numbered in column 1 of the score sheet reproduced on an earlier page (see Table 15). The CUCR solution is the offence which appears first in the offence classification list of the *CUCR Manual*.

### PROBLEM 1

« A hold-up man forces a husband and his wife to get out of their automobile. He shoots the husband, gun whips and rapes the wife [hospitalized] and leaves in the automobile [worth \$2 000] after taking money [\$100] from the husband. The husband dies as a result of the shooting. The vehicle is never recovered. »

*Solution:* CUCR ~ 1 murder

*Proposed scoring*

Element	Number	Weight	Total score
I(c)	1	7	7
I(d)	1	28	28
II	1	10	10
II(a)	1	1	1
V	1	2	2
VI(d)	1	4	4
			Total score 52

The husband was killed (28); the wife was raped (10), threatened with a gun (1) and sustained injuries requiring hospitalization (7). The car was stolen (2). The total value of the property lost, car and money, was \$2 100 (4).

### PROBLEM 2

« Two thieves break into a warehouse [damage \$20] and load considerable merchandise [worth \$3 500] on a truck [worth \$3 000]. The night watchman is knocked unconscious with some blunt instrument [treated and discharged]. The thieves drive away in the stolen truck. The truck is recovered. »

*Solution:* CUCR ~ 1 wounding ~ inflicting bodily harm

*Proposed scoring*

Element	Number	Weight	Total score
I(b)	1	5	5
IV	1	1	1
V	1	2	2
VI(e)	1	5	5
			Total score 13

Forcible entry (1), injury to night watchman requiring treatment (5), theft of motor vehicle (2), and loss of \$3 520 in value (5).

### PROBLEM 3

« Three men break into a public garage [damage \$20] after closing hours. They steal cash from the garage office lockbox [\$50] and two automobiles from the shop [one worth \$1 500 and the other \$3 000. The latter is recovered undamaged with nothing stolen from it; the former is not recovered]. »

*Solution:* CUCR — 1 breaking and entering

*Proposed scoring:* effects of event ~ I (T) (D)

Element	Number	Weight	Total score
IV	1	1	1
V	2	2	4
VI(d)	1	4	4
			Total score 9

Forcible entry (1); two motor vehicles stolen (4); total loss of property, \$1 570 (4).

#### PROBLEM 4

« An automobile containing clothing and luggage valued at \$375 is stolen. The car is recovered [undamaged] but the clothing and luggage are missing. »

*Solution:* CUCR — 1 theft — motor vehicle

*Proposed scoring: effects of event — I (T) D*

Element	Number	Weight	Total score
V	1	2	2
VI(c)	1	3	3
			Total score $\bar{5}$

Motor vehicle theft (2); loss of property, \$375 (3).

#### PROBLEM 5

« An automobile [worth \$2 000] is stolen and a short time later it is used as a get-away car in an armed robbery [netting \$50]. The car is not recovered. »

*Solution:* CUCR — 1 theft — motor vehicle and 1 robbery

*Proposed scoring: effects of event — I (T) D*

Event	Element	Number	Weight	Total score
1	V	1	2	2
	VI(d)	1	4	4
			Total score $\bar{6}$	
Event	Element	Number	Weight	Total score
2	III(b)	1	3	3
	VI(b)	1	2	2
			Total score $\bar{5}$	

As stated, the problem indicates that there are two events, each to be scored separately. In the first event, a car was stolen (2) worth \$2 000 (4). In the second event a hold-up with gun (3) resulted in a total loss of \$50 (2). If the events had been of such a nature that they could have been scored as one event, the total score would have been 9, instead of the score of 11, due to the method of scoring total property loss during an event.

#### PROBLEM 6

« Answering an « armed robbery in progress » broadcast, two policemen are engaged in a gun battle with three armed robbers; one of the bandits is killed and the other two captured. [Presumably no one was injured except the robbers.] »

*Solution:* CUCR — 2 woundings — with intent

*Proposed scoring:* if no one was injured except the robbers, this would be an I T D event, if theft had actually occurred

before the police arrived. If so, the event would be scored for intimidation by weapon (3), plus the score or weight for value of property taken, which if the total amount were \$300, for instance (3), would total 6 for the event. If the robbers failed to carry out their crime, because the police came before any property had been taken, the event would be considered an attempt and not scored at all for index purposes.

## PROBLEM 7

« Three men murder one person. »

*Solution:* CUCR — 1 murder

*Proposed scoring: effects of event — (I) T D*

Element	Number	Weight	Total score
I(d)	1	28	28

## PROBLEM 8

« Answering a « riot » call, police find that seven persons were in a fight. A variety of weapons are strewn about. None of the participants is particularly cooperative. Each one claims innocence but is vague as to who is responsible for the incident. Three of the seven are severely wounded [all hospitalized]; the others sustained minor injuries but did not receive any medical attention. »

*Solution:* CUCR — 3 woundings — inflicting bodily harm

*Proposed scoring: effects of event — (I) T D*

Element	Number	Weight	Total score
I(a)	4	2	8
I(c)	3	7	21
Total score			29

## PROBLEM 9

« Forty persons are present in a nightclub when it and the forty patrons are held up by armed bandits [taking a total of \$1 800]. »

*Solution:* CUCR — 1 robbery

*Proposed scoring: effects of event — I (T) D*

Element	Number	Weight	Total score
III(b)	1	3	3
VI(d)	1	4	4
Total score			7

## PROBLEM 10

« Three men strong-arm and rob a man on the street [of \$50]. »



*Solution:* CUCR — 1 robbery

<i>Proposed scoring: effects of event — (I) (T) D</i>			
Element	Number	Weight	Total score
I(a)	1	2	2
VI(b)	1	2	2
			Total score 4

**PROBLEM 11**

« You receive a report from three separate women on three separate days. All say they were knocked to the ground and their purses stolen. On the fourth evening, police arrest a young person who had just tried to grab a women's purse after hitting her in the face. He admits the attempt and three robberies on the previous days. »

*Solution:* CUCR — 4 robberies

*Proposed scoring:* the events are obviously separate ones to be scored separately. As each of the three previous events should already have been scored in the index for non-cleared offences, these events should simply be re-classified in delinquency or crime indexes, depending on the age of the offender. The fourth event should be scored for minor injury I(a), a score of 2.

**PROBLEM 12**

« Six rooms in a hotel are broken into [total damage \$60] by two sneak thieves on one occasion. [The total value of property stolen from the rooms, occupied by different tenants, amounted to \$1 200.] »

*Solution:* CUCR — 6 breaking and entering

<i>Proposed scoring: effects of event — I (T) (D)</i>			
Element	Number	Weight	Total score
IV	6	1	6
VI(d)	1	4	4
			Total score 10

There were six forcible entries (6) and the total value lost was \$1 260 (4).

**PROBLEM 13**

« One night a building is broken into [damage \$10]. In all, twenty-one offices (rooms or partitioned spaces) are ransacked. These offices are occupied by 1) a lawyer; 2) a doctor; 3) Apex Co., and 4) Elite Co., who do not share their space and are not related in a business way [and who presumably kept their premises locked, and who altogether lost \$6 000 and had property, worth \$100, damaged]. »

*Solution: CUCR — 4 breaking and entering*

*Proposed scoring: effects of event — I (T) (D)*

Element	Number	Weight	Total score
IV	5	1	5
VI(f)	1	6	6
Total score			11

There were four forcible entries plus the forced entry of the building (5) and a total of \$6 110 stolen and in damages (6).

## JUVENILE, ADULT AND UNCLEARED OFFENCES

An index of crime and delinquency must reflect the extent and nature of the criminal events which are reported to and recorded by the police. Yet, if the community is to engage in effective action to prevent and to control the incidence of crime and delinquency, one single index which lumps together the criminality of apprehended juveniles and adults would not be of much use. Although in many respects the problems involved in delinquency control and prevention are similar to those involved in crime control and prevention, significant differences do exist.

Consequently, it seems necessary to construct three distinct indexes for offences committed by: 1) apprehended delinquents; 2) apprehended adult offenders; 3) non-apprehended offenders whose age cannot be determined and whose offences, therefore, cannot be counted in the first or the second index.

The importance and necessity of using the third index, that for offences committed by non-apprehended offenders, must be emphasized. If juveniles commit 50% of cleared burglaries, it cannot be assumed that they also committed 50% of all burglaries reported to or recorded by the police, for this percentage may be due to the fact that juvenile burglars are more easily apprehended than adult burglars. The same may be said for other serious offences committed by juveniles.

To state it more succinctly, *the proportion of serious juvenile offences cleared is not « the same as the proportion of juvenile offences among all offences, cleared or uncleared »* (Sellin and Wolfgang, 1964, p. 128).

Therefore, the third index cannot be eliminated by distributing its scores between the juvenile and the adult indexes.

## D. THE JUVENILE DELINQUENCY INDEX

### 1. CONCERNING JUVENILE DELINQUENCY

It is possible to establish the objective existence of an offence against the criminal law without knowing who committed it, but an offence cannot with certainty be attributed to a juvenile offender unless his apprehension enables the police to determine his age. *An index of delinquency must, therefore, be based on offences committed by apprehended juveniles.*

### 2. WHO IS A JUVENILE ?

If an index is to be based on offences committed by juveniles, the term « juvenile » must be defined. In Canada, the term is generally used to apply only to persons who commit offences that can be adjudicated by a juvenile court, although in some cases they may not be adjudicated by such a court. Therefore, « *offences committed by juveniles* » *must be understood to mean offences attributable to them regardless of in what type of court or by what type of procedure they could be adjudicated.*

This still does not tell us to what age bracket a « juvenile » belongs. In Canada, while the lower age limit is set by the criminal code to be seven, the upper age limit of children brought before the juvenile courts varies in the provinces. The *Juvenile Delinquents Act* defines a child as « any boy or girl apparently or actually under the age of sixteen, or such other age as may be directed in any province ». In other words, a person can become a juvenile *delinquent* when the juvenile court can deal with him as such, and adult or young criminal when the juvenile court no longer can exercise original jurisdiction over him and his offence. If in a province, the juvenile population at risk is the one between seven and eighteen (in Quebec for example), it is obvious that indexes of delinquency based on these populations would not be comparable. A uniform definition of juvenile age bracket is therefore needed. It is suggested that *an index of delinquency be based on offences committed by apprehended juveniles found to be seven years or older but not yet eighteen.*

It should be pointed out, however, that if so decided, an upper age other than eighteen may be used. What must be stressed is that any other upper age must be used uniformly across the country so that the results of the indexes in different cities, counties and provinces may be comparable.

### 3. SHOULD ALL JUVENILE OFFENCES BE CONSIDERED ?

Juvenile delinquency includes many kinds of conduct. In addition to violations of the criminal law, it embraces many « juvenile status offences », such as incorrigibility, truancy, running away from home, etc. These are offences which either may not be punishable at all if an adult committed them — i.e., they would not be crimes in his case — or which an adult could not commit. It is recognized that children who are habitually truant, runaways, incorrigible or have highly undesirable associates may need assistance and guidance that can only be assured by bringing them to the attention of a juvenile court. But authoritative opinion today — as reflected in the *Standard Juvenile Court Act* adopted by the (American) National Council on Crime and Delinquency, and in resolutions passed by the Second World Congress on the Prevention of Crime and the Treatment of Offenders, conducted by the United Nations in London in 1960 — holds that such conduct should not be labelled delinquency. *An index of delinquency should, therefore, be based on offences which would violate the criminal law if the offender were an adult.*

### 4. SHOULD ALL THE VIOLATIONS OF THE CRIMINAL LAW BE CONSIDERED ?

All offences against the criminal law which juveniles can commit are not useful for index purposes. In the introductory section of this chapter, the types of offences which should not or cannot be scored for the proposed index were listed, and their exclusion applies when constructing the index of delinquency.

*An index of delinquency should therefore be based on offences against the criminal law committed by known juveniles and of such a nature that the injury they cause will prompt primarily the victim or some other private person to notify the police of their occurrence.*

### 5. MIXED EVENTS

Events in which both adults and juveniles participate as offenders are here called mixed events. An arbitrary decision has to be made on whether or not such an event should be scored for use in constructing the delinquency index. It should be scored *only* when the number of juvenile participants (offenders) *exceeds* the number of adults. When there is an equal

number of juveniles and adults, the event should be scored in the (adult) crime index.

Note, however, that the *juveniles involved* in such events should be included, when, instead of a *delinquency index*, an *index of delinquents* is constructed, where each such juvenile is given the score value attached to the event in which he participated.

#### 6. PETTY OFFENCES

An index should measure *real* delinquency. Even though it can be based only on recorded offences by apprehended juveniles, it must be of such character that one may assume that it shows not just changes in the rate of recorded occurrences but is in fact an index to the totality of the kinds of offences on which it is based, whether recorded or unrecorded. All offences, even some of those in the first class, mentioned in the introductory section of this chapter, are not likely to be so injurious that they « will prompt the victim or some other private person to notify the police ». In some occurrences, the « injury » may be so trivial that the proportion reported will be small. Inflicting a minor injury or physical intimidation, verbal intimidation, theft under \$50, and even an unsuccessful attempt at committing more serious offences (« forcible entry » without causing any damage, with intent to steal) have a low degree of reportability and therefore events involving *only* one of these offences, and nothing else, ideally should be excluded in constructing the index of juvenile delinquency.

In large urban areas, where the volume of delinquency is considerable, the exclusion of these petty offences may be possible, as juvenile delinquency generally is of a more serious nature. However, because petty offences do form a sizable percentage of urban delinquency, their exclusion may lead to a biased reflection of the reality.

In small communities, where most of the delinquency consists of petty offences, the exclusion of these would not permit an adequate assessment of the extent and character of delinquency in such communities.

Thus, it is suggested that petty offences be included in constructing the delinquency index, despite the low reportability of these offences.

However, when analysing the yearly results, caution must be exercised, and any unusual fluctuations in the number of

events involving *only* one minor injury or one physical intimidation, one verbal intimidation, or one forcible entry (without causing damage) or only a theft under \$50 should be noted.

## 7. CONSTRUCTING THE DELINQUENCY INDEX

When all the delinquency events resulting in physical injury, property theft, damage which occurred during a given period of time (month, year) have been scored, an index for that period can be constructed using the following procedure:

— Count the events and add up their scores.

— Locate statistics of the size of the juvenile population consisting of juveniles of seven years and over, but under eighteen years of age (seven to seventeen) in the community to which the index applies.

Statistics of the size of the juvenile population may be difficult to secure for the years between federal censuses. For intercensal years, the school census taken by local educational authorities may provide data. Where the compulsory school age includes those seventeen years of age such data may prove to be adequate, but if the compulsory school age is lower, other sources of information have to be sought. There may be other agencies than the schools in the community that can furnish a close estimate of the size of the seven to seventeen age group. In any case, this information is *essential* for the computation of reliable rates.

— Using the sum of the scores, compute the rate per ten thousand of juvenile population. *This is the delinquency index.* Sub-indexes are arrived at by computing specific rates, in the same manner, separately using the sums of scores of events that involve: a) physical injury only; b) physical injury and theft; c) physical injury and damage; d) physical injury, theft and damage; e) theft only; f) theft and damage; g) damage only; h) combinations of these, such as a+b+c+d and/or e+f+g.

In the interest of uniformity and intercommunity comparability, it is suggested that at least the following three classes of events be segregated and rates computed for them: those in which physical injury occurred, those in which theft but no physical injury occurred and those involving only property damage.

It should be emphasized that *the index is not an index of juvenile delinquency in general but only of the kinds of delinquency that enter into the construction of the index.*

It was suggested above that the number of events be counted for each class and *in toto*. This information can be used: a) to compute frequency rates per one thousand or ten thousand of the juvenile population; b) to secure the mean (average) score value of an event in each class or in all classes combined, arrived at by dividing the total scores by the number of events they represent. The frequency rates, over a period of time, will show whether or not juveniles in the population tend to become more or less involved in delinquency events, and the mean score value of an event will indicate, on the average, whether or not events are becoming more serious in nature. Of course, confidence can be placed in such comparisons only if the definition of an « event » remains constant and the method of scoring stays unchanged.

It is conceivable that communities, very different in the size of their populations, might have identical index figures and mean event scores. The burden of personal injury and property loss borne by such communities, however, would not be identical; it would be natural to consider that burden heavier for the smaller than for the larger community. A rough and ready way of arriving at an estimate of the comparative weight of that burden is to compute a rate or rates per one hundred thousand of the total population.

## E. THE (ADULT) CRIME INDEX

What has been said for constructing a juvenile delinquency index or juvenile delinquency sub-indexes, is equally valid with minor modifications, for constructing the (adult) crime index and sub-indexes.

### MODIFICATIONS

- a) An adult is any person eighteen years of age or over.
- b) While petty offences committed by juveniles may be included in the construction of the delinquency index, the rationale outlined above for including these offences is not valid for adult offenders. Indeed, inflicting a minor injury or physical intimidation, verbal intimidation, forcible entry (without theft and/or damage), and thefts under \$50 when committed by adults have a low degree of reportability and do not constitute an important portion of the total adult criminality.

Given these circumstances, it may be advisable not to count

events involving *only* a minor injury or physical intimidation, or a verbal intimidation and/or a forcible entry (without theft and/or damage), or a theft under \$50. However, this rule of exclusion may be applied only when constructing a crime index to be used alone.

c) Events in which the number of adult participants (offenders) is *equal to or exceeds* the number of juveniles should be classified as adult events.

Note, however, that the adults involved in events classified as juvenile should be included when instead of a *crime index*, an *index of criminals* (adult) is constructed, and each such adult given the score value attached to the event in which he participated.

d) When constructing a crime index, the procedure to be followed is identical to the one suggested for juveniles except that the size of the adult population must be computed on the basis of all persons aged eighteen and over. If these data are not readily available, they can be computed by adjusting the latest census data, taking into account the best estimations of mortality, immigration and emigration figures for a given period (month or year).

## F. THE INDEX FOR UNCLEARED OFFENCES

It seems logical to assume that the indexing method could be applied to all events of the kinds dealt with in this chapter, so long as the investigation of the events has revealed the presence of the elements needed for scoring them. The only source of possible bias in the construction of an index for uncleared offences may rest in the accuracy of the complaint made by the victims, as sometimes claim-conscious persons may report the value of stolen objects to be higher than their actual value, or a victim robbed by a prostitute may claim to have been assaulted in the dark by two juvenile offenders. However, despite this kind of bias, an index for uncleared offences would yield fairly accurate data.

## NOTES

### 1. CONSTRUCTING AN INDEX OF DELINQUENTS AND AN INDEX OF CRIMINALS

The purpose of this chapter has been to present a method



of scoring crime and delinquency events based on their objective features and without reference to the participant offenders, except to identify them whenever the offenders are apprehended, as juvenile or adult. This section is added to suggest, most briefly, some ways in which information possessed by the police about scored events might be used a) for an analysis of some aspects of crime and delinquency; b) for constructing indexes of delinquents and criminals.

Events occur at specific times and places. Their number and their total and mean scores can therefore be given for each police district, census tract or other area in which they occur. They can be given by month, week, day and hour, grouped by the number of participants and by certain characteristics of these offenders, such as age, sex, etc.

The juveniles who participate in an event scored can each be given the score value of the event. When this is done, an *index of delinquents* can be constructed from the sum of the scores by transforming the sum, for delinquents of all three classes or for each of the three classes separately, into rates based on the juvenile population at risk. *When the mean score value per delinquent is computed, care must be taken to count delinquent individuals, for some may have been involved in more than one event during the period.*

As in the case of events, the information about the scored unduplicated delinquents can be used in various ways. Specific age and sex rates can be computed if these items of information are available for the population at risk. The distribution of delinquents by area of residence can be made. Relationships between the type of event and the personal characteristics of the offenders can be studied, etc.

To make such analyses of events and delinquents possible, it is necessary that a) the data needed are recorded by the police; b) they can be correlated without much difficulty. The investigation report of an event which has resulted in the apprehension of one or more juveniles should provide for recording not only the objective features of the event, but such information as the time and place of its occurrence, as well as the age, sex, and other important characteristics of each juvenile participant. In large police departments using punch cards and computers this information should be coded and punched for subsequent analysis.

*The index of criminals may be constructed according to the method suggested for the delinquents.*

## 2. FORMULAS FOR COMPUTING INDEX STATISTICS

Table 16 presents the formulas for the various computations suggested by our earlier discussions of index offences and index offenders. It refers specifically to delinquency, as an example, but can be used for crime and uncleared offences as well.

Each of the computed statistics provides a specific and different piece of information. Sellin and Wolfgang described them as follows: Formula I provides the chief comparative statistic for a weighted index of delinquency based upon the juvenile population seven through seventeen years of age. The resulting statistic from Formula I answers the crucial question: Among a group of ten thousand juveniles in a given community, what is the seriousness of harm inflicted through delinquency? Formula II provides an index of the « community harm » or « social injury » sustained by the whole community. This is done by distributing the total seriousness scores throughout the entire population. The result obtained through Formula II answers the question: In a group of ten thousand persons of a given community, what is the gravity of harm inflicted through delinquency? Formula III provides information on the average seriousness score per delinquency event.

Formulas IV, V and VI describe, respectively, the average seriousness per offender, the seriousness score in the event involving the average offender and the average juvenile's seriousness in the entire juvenile population. Formulas VII and VIII do not involve use of weights for events and express simply the average number of offenders per event and the number of offenders in the event involving the average offender.

As a regular practice for maintaining an index of crime and delinquency in a community, the statistics derived from Formulas I, II, III and VI are recommended as the minimum for comparative purposes. Although Table 16 is based on the combination of Categories A (bodily injury), B (theft) and C (damage), it should be obvious that three separate tables for each category, or seven separate tables for I (injury), T (theft), D (damage) and combinations of these (I-T, I-D, T-D, I-T-D),

TABLE 16  
Formulas for computing delinquency index statistics <sup>27</sup>

Formula	Explanation	Interpretation	Short title
I. $\frac{\sum fs}{j} k$	$\frac{\text{(Seriousness summed over events)}}{\text{(Juvenile population)}} (10\ 000)$	Average number of seriousness units, or weighted rate per 10 000 juveniles at risk.	Juvenile harm
II. $\frac{\sum fs}{p} k$	$\frac{\text{(Seriousness summed over events)}}{\text{(Juvenile population)}} (10\ 000)$	Average number of seriousness units inflicted or weighted rate per 10 000 population.	Community harm
III. $\frac{\sum fs}{f}$	$\frac{\text{(Seriousness summed over events)}}{\text{(Events)}}$	Average number of seriousness units per event.	Seriousness per event
IV. $\frac{\sum fs}{\sum fn}$	$\frac{\text{(Seriousness summed over events)}}{\text{(Offenders)}}$	Average number of seriousness units per offender.	Seriousness per offender
V. $\frac{\sum fns}{\sum fn}$	$\frac{\text{(Seriousness summed over offenders)}}{\text{(Offenders)}}$	Number of seriousness units in event involving average offender.	Average offender seriousness
VI. $\frac{\sum fns}{j}$	$\frac{\text{(Seriousness summed over offenders)}}{\text{(Juvenile population)}}$	Number of seriousness units in event involving average juvenile at risk.	Average juvenile seriousness
VII. $\frac{\sum fn}{\sum f}$	$\frac{\text{(Offenders)}}{\text{(Events)}}$	Average number of offenders per event.	Offenders per event
VIII. $\frac{\sum fn^2}{\sum fn}$	$\frac{\text{(Offenders summed over offenders)}}{\text{(Offenders)}}$	Number of offenders in event involving the average offender.	Offenders in average offender's event

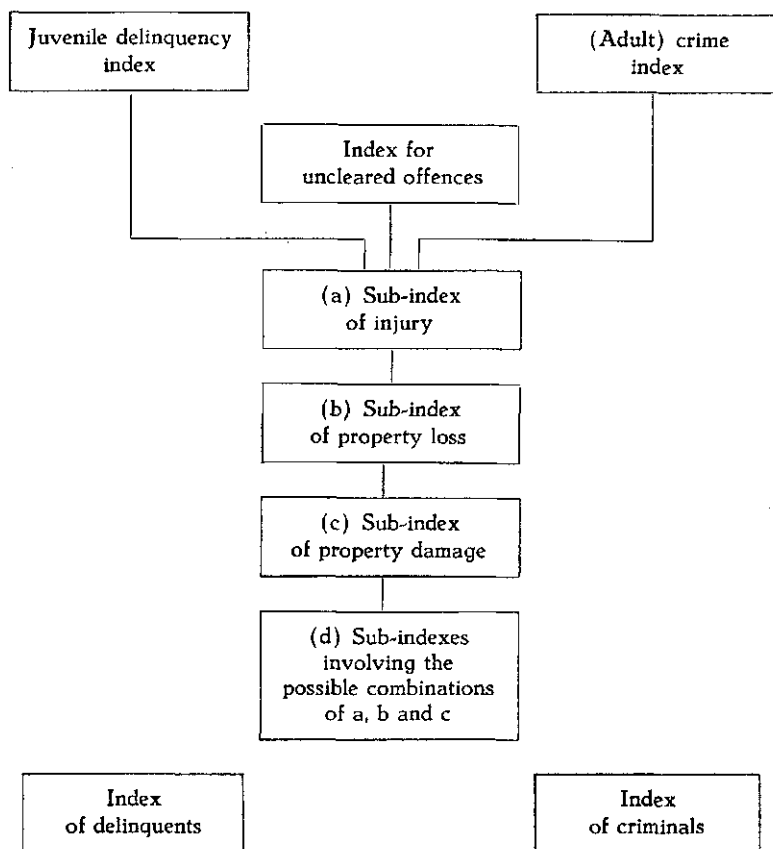
27. Sellin and Wolfgang (1964, p. 307). With appropriate adjustments, these statistics may also be computed for offences committed by adults. Table 16 is reproduced with the kind permission of the authors.

could, and perhaps should, be constructed by police departments using this model to produce sub-indexes<sup>28</sup>.

### 3. PROPOSED MAJOR INDEXES

The major indexes proposed in the following pages are summarized in Table 17.

TABLE 17  
The index of crime and delinquency



28. Sellin and Wolfgang (1964, p. 306sqq.).

PART THREE  
CHAPTER FIVE

TECHNICAL ISSUES  
AND OBJECTIONS

In this chapter, we would like to discuss succinctly a number of technical issues and objections which have been raised or entertained in connection with the proposed new index of crime and delinquency.

**A. TECHNICAL ISSUES**

1. OFFENCES WHICH ARE NOT INCLUDED  
IN THE INDEX

The index presented in the preceding chapter has been constructed with the assumption (stated earlier) that an index of crime and delinquency should be based on offences with assumed constant high reportability, violating the criminal law, known to the police, and inflicting bodily harm on a victim and/or involving theft, damage or destruction of property. Therefore, this index is not a « general » index of crime and delinquency.

Obviously, the proposed index will not tap all the crime and delinquency which occur in the community. Events involving disorderly conduct, corner-lounging, intoxication, illegal possession of liquor, possession and/or consumption of drugs and barbiturates, indecent exposure, sodomy, fornication and events involving a multitude of other violations of the criminal code will not be included in the index. Yet, the community may be highly apprehensive about these violations and the agencies involved in the control and/or prevention of crime and delinquency may be anxious to have a more accurate picture of the incidence and nature of these offences. Social scientists studying

different aspects of crime and delinquency may also be interested in this information.

The methods and techniques used for the formulation of the proposed index are such that any infraction of the criminal law may be given a score of seriousness. It is possible to take any particular offence that has been scaled before, for example, any one of the fourteen offences described above, present it to a rater, assign a number (the modulus) to it and then ask the rater to assign a number to the new and unscaled offence. If this is done with a large number of raters and all of them are asked to make a single numerical judgment about the new offence, then the mean score of that new offence, relative to a normalized modulus (multiplying or dividing the new offence by a factor that will make the modulus equal for all of the rates) will provide the value of the new offence relative to the existing scale. Even if a different offence is used for each judgment and assigned an arbitrary value, the score for the new offence does not depend on the choice of the offence which is used as the standard on the basis of which new judgments are made. This easy method makes it possible to ascertain the seriousness of previously unscaled offences (Sellin and Wolfgang, 1964, p. 270). Another, more cumbersome but ideally preferable, method is to re-run tests for the set of fourteen index offences, plus specific new offences for which scores are needed, after having randomly scattered the new offences among the index offence descriptions.

## 2. FEMALE OFFENDERS

The scores of the index proposed in the last chapter have been derived from the ratings of offences which were described as having been committed by male offenders. The rationale underlying this procedure is that the great majority of crime and delinquency is committed by men and boys. Strictly speaking, then, the index can be used only to score events involving male offenders or when the majority of the participants in an event are men. However, if a complete picture of the crime and delinquency of an area is sought, obviously the events involving female offenders (juveniles and adults) must also be scored. While empirical testing is required to ascertain the applicability of our scores for female offenders, it is hypothesized that the likelihood of getting a set of scores significantly different from those obtained for male offenders is minimal. After all, it should

be kept in mind that what is being scored is the event and not the offender. The seriousness of a robbery would not be affected by the sex of the offender(s). The harm inflicted in a given robbery is identical whether the offender is a man or a woman.

To all intents and purposes, the index proposed here can be used for scoring events involving female offender(s) as well as male offender(s).

### 3. POPULATION CHANGES

Since we have constructed a « weighted national » index on the basis of the percentage of the population residing in each province and for the two major ethnic groups residing in Quebec and New Brunswick, based on the 1961 census, it is necessary to examine the effects of differential rates of population increases or decreases. It will be necessary in the future to re-adjust the index scores in this perspective. However, despite these demographic changes, the strong consensus among all the Canadian groups appears to preclude the possibility of significant changes in the scores. It will be recalled that when each province was given an equal weight, the difference between the results obtained by this method and those obtained by different weighting were practically identical in terms of magnitude scores. Moreover, the population increases do not change considerably between provinces. For example, from 1961 to 1966, the percentage of the population residing in the largest two provinces remained relatively stable. Quebec had 28.8% of the Canadian population in both census years whereas Ontario had 34.6% in 1966 compared with 34.2% in 1961. The relative percentage of each ethnic group (English and French) in Quebec and New Brunswick did not change either between 1961 and 1966. In fact, when the computations leading to the weighted national index scores were repeated on the basis of the new census figures for 1966, we found no differences except a few at the fifth decimal.

### 4. CHANGES IN ATTITUDE

The proposed index reflects broadly the current social values in Canadian society. Over long periods of time, it may well be that attitudes towards the relative seriousness of certain offences will change, as with other attitudes. It appears, however, at least with respect to the offences used for the construction of the index, that they represent a core of offences to

which strong community sentiments have been traditionally attached. We are inclined to think that the responses obtained in our study will remain highly consistent over time and space. Nonetheless, in a few decades further research will be required to test the accuracy of this assumption. However, there is already some evidence that certain basic values do not change substantially. In a study in Israel, Rettig and Pasamanick (1963) found that relative to items examined on the dimension of criminal morality, no significant changes or differences whatsoever were observed between two generations.

## B. ANSWERING OBJECTIONS

*Objection 1.* The yardstick used is too simple and thus is inadequate. A judge returning his booklet commented: « It is a chilling thought that millions of our dollars are regularly squandered as a result of assumptions as to the accuracy of statistics as quaint as yours. » Our answer is that the measurement of complex events does not necessarily require the use of complex instruments, for the instrument complex in « appearance » does not necessarily yield more accurate results than the so-called « simple yardsticks ». What is most important is that the yardstick be reliable and valid. We believe that ours has successfully met the first test, and is quite adequate on the second account.

*Objection 2.* Some of the index scores are not derived from the ratings of the respondents. Therefore, the index is arbitrary. The first statement is true; the second, not quite. The method of obtaining the magnitude scores is such that it is claimed to produce a ratio scale and therefore assumed to have additivity, which enables us to derive the magnitude scores not provided by the respondents.

*Objection 3.* The assumption of additivity is not valid. This objection cannot easily be answered here, for there is no definite agreement among scientists as to whether the proposed scale has « all » the properties of a ratio scale and therefore additivity. However, support for the validity of this assumption has been found in studies of loudness and brightness, the findings of which have been put to practical use in the field of acoustical and illuminating engineering. Reviewing the results of studies relating to loudness, Stevens (1959) concluded that



[while] the agreement is far from perfect, it has been good enough to lead a committee of the International Standards Organization to recommend a standard scale for the measurement of loudness ... One important use that has been made of this subjective scale is the development of the procedure by which the loudness of complex sound can be calculated from a knowledge of the spectrum of the sound (p. 39).

The additivity of seriousness of criminal elements in an event has been assumed in Sellin and Wolfgang's research as well as ours. The alternative would be to scale all conceivable combinations of elements, but this alternative appears impractical and prohibitive in monetary terms. Experimental studies should, however, be done in the future to examine the « interaction factor » present in the combination of various elements. Complex elements, after all, could be weighted by raters as well as the more simple offence descriptions, although it would require the rater to exercise much more discrimination in his thinking than might be possible to expect.

*Objection 4.* It may be argued that the loudness of sound and the brightness of light (used in psychophysics) and the seriousness of offences are not comparable stimuli; while the former are objective and immediately felt, the latter is subjective and mentally recreated. We contend, however, that when an offence is described in identical terms to large groups of subjects it assumes the characteristics of an objective stimulus which is perfectly well measurable. What we are suggesting here is that the semantic convention under which we use the terms « subjective » and « objective » does not necessarily imply a philosophical dualism, for these terms are merely the labels we attach to two classes of perceptual phenomena. As a matter of convenience, we make a rough distinction between two classes of stimuli, but they are both capable of similar operational definition.

*Objection 5.* The raters were not aware of the additivity assumption and, therefore, the interpretation based on this assumption does not reflect the true opinion of the raters. The first argument is correct. The second one is debatable. As Stevens (1966) pointed out:

It is doubtful that any of the raters would have been conscious of the underlying additivity in any explicit way, and some of them would probably be offended by the thought that one forcible rape can be equated to some

number of money thefts. Nevertheless, both the quantitative estimates of large numbers of raters and the gradations in the punishments prescribed by the law make a strong argument for the equatability and additivity among offenses (p. 537).

In this connection Sellin and Wolfgang (1964) also pointed out: « It is apparent that the punishments provided by the law for criminal offences of various kinds represent crude judgments by legislators of the comparative seriousness of offences » (p. 349). Thus, when the Canadian Criminal Code sets the maximum penalty for infanticide at five years and for extortion at fourteen years, the latter is implicitly regarded as nearly three times more serious than the former.

Support for the argument of equatability and additivity is also provided by sentencing studies. Green (1961), for example, found that as the gravity component of the offence increases (particularly in cases involving personal injury), this becomes the paramount criterion for determining the severity of the sentence.

*Objection 6.* The index scores are arbitrary. This is partly true and partly false. Even if the index is a ratio scale, there is still an arbitrary element in it. There is no « natural » unit of crime so far as we know and so it is perfectly true that the choice of what represents 1 on the scale is arbitrary. However, the scale claims only that the ratio of one score to another implies corresponding ratios of seriousness. This is to say that the ratio scale does not prescribe a unit, but that once that unit is set, then the rest of the scale is determined. The important thing is that the ratios be not arbitrary.

*Objection 7.* Some individuals or groups give numbers quite different from the average. This is quite true and it may or may not be due to chance. If it is not, then this implies that some people have unusual ideas or that groups differ in their opinions about the relative seriousness of various offences. After all, it would be astounding if it were not so. In fact, the disparities found in our study are insignificant in relation to the enormous disparity in sentencing policy noted among trained judges. There was certainly more consensus about the seriousness of different crimes among our subjects than there usually is in the subjective assessment of experienced judges as revealed through their sentencing practices (Jaffary, 1963; Mewett, 1962).

All that the present scheme says is that there is sufficient consensus and « reasonable agreement » among the individuals and the different groups to justify the use of the index.

*Objection 8.* The scale values represent learning and thus are trivial. The argument runs as follows: people roughly learn the law and therefore have a rough idea that murder is punished more severely than robbery and both more severely than larceny, and so on. Thus, when the raters are asked to scale offences they estimate how these would be punished by the legal system of the country. This is a notion hard to disprove with the data at hand. But it may be pointed out that, even if the consensus is arrived at in the above way, it is just as real as consensus arrived at in some other way. It does not seem trivial just because it was learned. Present perceptual judgments are not without interest merely because they may have been conditioned by past experience. Furthermore, judgments expressed about other variables in other situations have shown that the power law holds where learning has not taken place (Stevens, 1959).

*Objection 9.* The scale values do not represent experiential learning and thus are trivial. This argument is almost the opposite of the above argument. It runs: the crimes that people were asked to judge were hypothetical to them. They were, in all likelihood, never robbed, beaten or raped, and certainly not murdered. Thus, these scores are not based on how people would actually feel but only on how they think they might feel if such misfortunes fell upon them. Thus, the numbers are trivial. This again is a notion hard to disprove with the data at hand. What it says is that the scores for the victims of offences will be quite different from the scores of the non-victims. This may be true. But even if it is, it is clear that the non-victims of offences have a hand in creating consensus about crimes. The doctrine that the victim should judge the seriousness of the offence would lead to bizarre results in abortion, homicide, etc. In addition, the fact that an opinion is hypothetical does not make that opinion worthless. In this connection, Galanter (1962) stated that:

... prior to a decision, one always considers the alternative as hypothetical and, presumably bases his actions on these considerations. To argue that we use an hypothetical situation to scale the value of money, and, therefore, that the scale does not represent what people do, is to prejudge the usefulness of the scale as a characterization of the hypotheses that antedate the decision (p. 212).

It is interesting to note that the preliminary results obtained by a recent survey conducted by the President's Crime Commission by the NORC (National Opinion Research Center) indicated no significant differences between the ratings of the victims and those of the non-victims. The ratings were done on a category scale based on the Sellin-Wolfgang scheme.

*Objection 10.* The index can be used to score only a limited number of offences. This is true. However, it must be remembered that what is being proposed is an index and not an inventory. As Wilkins (1965) pointed out: « a base which would give good comparability and measure what most people mean by crime would be damage done or loss or injury sustained by actions known or believed to be illegal » (p. 282). The index measures this base. However, as pointed out earlier, the nature of the method used in developing this index is such that a weighted seriousness score for any crime may be obtained.

*Objection 11.* The scale values are not good enough in some regards and therefore they are useless. The argument here is that the scores are not accurate enough, valid enough or reliable enough to be useful. Of course this argument, strictly speaking, is true. The scores are not based on a random sample of all Canadians; attitudes may change, or even the relative seriousness of certain offences may change at certain times when, for example, these offences occur in greater than usual frequency and arouse great concern in a given community. We must first say that there is no perfect index simply because there are no perfect experiments. The question, so far as we are concerned, is not whether the index is ideal, but whether it is better than any other schemes in existence for the practical job of assessing the quantitative as well as the qualitative aspects of criminality. Seen from this vantage point, we definitely think it is.

*Objection 12.* The scores obtained through this index would not have much meaning. If, for example, total index scores were to decrease by 50% in a given community, it would appear that something had changed but it would be difficult to determine the exact nature of the change. For instance, the increase might be due to a decrease in the number of offences or in the seriousness of the offences committed, or to a combination of the two. Is this really more useful information than what which is presently available and which indicates which types of of-

fences decreased (or increased, or remained the same) per unit of population? This can be answered by pointing out simply that detailed figures will be attached to any report based on the proposed indexes and the analysis and interpretation of these. Figures will provide over periods of time information from which it will be possible to learn what the indexes actually provide and how reliable they are as indicators of change (Witmer, 1965). It must be remembered that the indexes will be used as *complementary* to the existing statistics, which give figures based on legal classifications of offences. Both systems should be used concurrently, for varying as well as common aims.

*Objection 13.* Some may, and probably will, question the implicit « value structure » in the proposed index. If they do, they should be careful to scrutinize their arguments dispassionately and with equal rigour. We may prefer to make value judgments without hard information or comparative ratings, and as individuals this may not matter. Socially dysfunctional behaviour (« crime »), on the other hand, is the concern of society and social policy should be determined by accurate information, not by prejudice. Any index which makes our value systems more potent or facilitates rational decisions regarding crime and delinquency is to be welcomed (Wilkins, 1964).

*Objection 14.* One last type of objection which may be stated here is the one which raises the question of the inherent difficulties of the judgment involved. Since the answer to the problem we are trying to resolve is most difficult, our answers are probably wrong. Therefore, the argument runs, we should look for easier problems. Here we might say that the fact that a judgment may be difficult to make is essentially irrelevant. The question is, can the judgment be made? More particularly, can it be made by the members of the population in whose attitudes towards crime and delinquency we are interested? This is an empirical question, of course, and can be decided only by experiment — not by a particular individual's conclusion that he himself could not make the judgment. An occasional subject may refuse to answer when asked to judge seriousness of crime, but, for the most part, as it appeared during our experiments, most people seem to attempt a serious answer when asked a serious question. The answers constitute be-

havioural data which we processed as we would have processed a set of meter readings. Of course, if the answers showed no thread of consistency, we would have decided that they were useless, for there would then be no sense in talking about the responses of the typical subject. On the other hand, if the answers manifest a consensus, at least to a reasonable order of approximation, we can proceed to answer the question of scientific interest: to what use, if any, can we put the data, and what role, if any, can they play in the furthering of insight and understanding (Stevens, 1959, p. 61)?

## CONCLUSION

The central problem in devising statistics of crime is to find ways of classifying events (crimes) which maximise the power of information for purposes of different specific social action. The criterion by which existing criminal statistics should be tested is their fitness for these purposes (actions). Indeed, this is the general criterion for testing any form of social statistics (Wilkins, 1965, p. 282).

In our brief discussion about the shortcomings of the CUCR system, we have shown how and why the statistics produced under that system do not fit this criterion of fitness and therefore are inadequate for studying the various and complex criminological and social problems which await answers.

In the preceding pages, we have outlined the major characteristics and the methods of operation of a new *Index of Crime and Delinquency* which provides the best standardized measure of criminality in Canada and which, we believe, stands well the test of fitness for social action. We therefore recommend that it be put to use as a most valuable supplement to the currently available criminal statistics.

No doubt this index is far from being the last word in the field of crime measurement, and it can be conceded that the proposed index is not *the* ideal index. To be realistic, there can be no ideal index, for there can be no perfect experiment. The aim, then, is to develop, on the basis of our current knowledge and its limitations, the best standardized measure of social consensus, which would reflect the best approximation of the state of crime and delinquency in Canada.

The proposed index is not a finished product since it will undoubtedly be improved upon in the course of time by further

experimentation, some of which we have already undertaken and at some future time even more accurate and sophisticated measures will be developed.

The need for, and the possibilities of, improvement should not, however, be an excuse for inertia now. The increasing concern about crime and delinquency problems is also increasing the demands on our human and financial resources to do « something » about them. In 1965, at the National Conference on the Prevention of Crime, held in Toronto, Professor Edwards noted:

... the mounting concern expressed by this country's senior police officers, both in public and more vividly in their annual reports, as to their ability to control, let alone get on top of, the mounting figures of indictable crime. Uppermost in my mind is the simple question — how much worse should the situation be allowed to become before society wakes up to its responsibility for providing the proper resources to fight its effective war against crime? ... it is worth noting that between 1961 and 1963 (the last year for which figures are available) the number of Criminal Code offences known to the police, and reported to DBS rose 32% in comparison with a rise in population of less than 4%. This represents the rise in recorded crime ... (p. 173-174).

In Canada, resources to date have been « quite limited » and, therefore, their judicious allocation is an imperative. We cannot afford to fight crime like Don Quixote hopelessly fought with the windmills. We think that the proposed index will provide some of the major guidelines for these allocations more accurately than any other scheme currently available to us.

As the Gluecks said in connection with the criticisms of their predictive tables, « the proof of the pudding is in the eating ». The pudding has been cooked with considerable effort and expense. If we are ever to find its worth, it must be tried, for only such trials will eventually produce the last word about the usefulness of the new index.



## APPENDIX A

Geometric means of the magnitude estimations for the fourteen index offences judged by Canadian *male* students in each province and by other special groups

Offence descriptions	Canada (all males)	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec (McGill)
A	5.06	8.58	6.86	5.93	6.37	6.19	5.47
B	8.65	11.30	9.73	9.63	8.25	7.80	8.68
C	11.41	12.80	12.90	12.60	8.99	10.10	10.80
D	26.08	21.20	22.00	25.00	19.60	17.90	23.90
E	35.28	26.30	28.70	29.80	22.30	23.90	30.30
F	13.06	13.70	12.50	13.40	10.70	11.90	15.30
G	19.84	26.10	24.30	23.80	21.30	18.00	25.10
H	33.91	34.00	38.90	32.50	28.10	28.30	45.50
I	214.90	233.50	181.00	137.00	400.00	236.00	414.00
J	45.88	46.80	34.00	42.60	50.20	34.70	67.55
K	29.28	33.50	29.50	30.10	27.50	25.80	41.05
L	8.95	10.80	7.90	9.58	14.20	14.30	9.64
M	75.23	92.70	72.00	80.10	80.90	61.70	137.00
N	10.55	11.30	11.00	10.90	10.20	10.20	11.20

## APPENDIX A (continued)

Offence descriptions	Quebec (Montreal)	Quebec (Laval)	New Brunswick (Fredericton)	New Brunswick (Moncton)	Nova Scotia	Prince Edward Island	Newfoundland
A	3.23	3.53	4.72	4.21	5.24	3.95	13.90
B	6.61	7.69	7.67	8.62	7.86	8.24	18.60
C	9.61	10.40	9.61	13.10	9.96	11.40	20.80
D	33.20	24.20	21.50	34.10	19.30	32.30	36.20
E	50.00	36.80	23.00	56.70	18.70	47.10	48.00
F	13.40	10.90	11.40	14.50	11.10	11.90	19.70
G	22.10	14.10	15.90	15.40	15.40	13.70	29.20
H	44.20	23.60	30.60	31.60	32.90	24.70	39.80
I	385.00	112.00	169.00	196.00	168.00	173.00	119.00
J	83.00	31.70	37.30	35.50	53.40	36.80	41.80
K	43.55	21.70	22.60	19.70	36.40	21.50	28.70
L	13.80	13.10	5.00	5.18	7.11	3.97	10.70
M	98.40	45.70	59.90	51.10	83.40	62.40	70.30
N	9.37	9.87	9.98	10.50	9.30	11.50	13.30

## APPENDIX A (continued)

Offence descriptions	Judges (English)	Judges (French)	Other special groups		Quebec (Montreal/pilot)	Philadelphia
			Police (Montreal/French)	White-collar workers		
A	6.24	1.58	5.74	8.37	3.63	22.09
B	8.42	2.81	9.55	9.46	6.69	27.77
C	11.10	4.63	12.79	11.90	7.74	32.31
D	26.30	27.40	25.11	19.90	28.60	52.99
E	33.60	38.20	30.02	25.70	42.70	69.13
F	26.90	33.40	14.01	15.20	6.05	40.62
G	34.90	44.60	23.92	35.10	16.20	52.25
H	63.30	76.80	32.41	64.90	36.10	86.33
I	145.00	159.00	133.01	233.00	452.00	449.20
J	43.10	49.20	41.59	57.50	45.70	115.60
K	25.40	30.00	30.23	27.40	17.10	69.20
L	11.00	8.92	10.09	14.30	5.50	22.50
M	88.80	86.80	80.90	86.80	146.00	186.30
N	10.70	8.94	10.50	14.30	8.20	27.19

## APPENDIX B

Geometric means of the magnitude estimations for the fourteen index offences judged by Canadian *female* students in each province and by other special group

Offence descriptions	Canada (all females)	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec (McGill)
A	6.06	7.61	5.95	6.22	5.97	6.91	7.64
B	9.85	11.50	9.46	9.81	8.89	11.10	11.70
C	12.76	13.75	12.80	13.50	11.00	14.10	14.20
D	26.79	26.80	23.60	28.30	22.60	23.90	29.30
E	33.81	30.40	34.50	35.20	29.60	30.80	35.20
F	13.73	16.40	12.50	14.10	13.80	13.70	16.60
G	19.21	24.60	19.50	19.10	19.00	20.20	19.60
H	26.73	34.10	26.70	29.00	26.90	29.70	32.30
I	154.20	132.50	126.00	116.00	117.00	234.00	217.00
J	52.42	56.20	45.60	53.00	50.35	54.90	59.30
K	35.33	36.01	33.60	35.40	36.70	39.20	41.80
L	13.53	14.70	11.50	12.20	14.30	20.30	13.20
M	92.15	84.40	87.30	78.10	78.30	136.00	112.00
N	11.02	10.90	11.20	11.50	10.80	11.60	12.20

## APPENDIX B (continued)

Offence descriptions	Quebec (Montreal)	Quebec (Laval)	New Brunswick (Fredericton)	Nova Scotia	Prince Edward Island	Newfoundland	Other special group : Quebec (Montreal/pilot)
A	2.15	4.88	6.40	6.19	2.68	5.67	2.11
B	5.13	9.15	10.20	10.80	4.93	9.00	6.20
C	7.77	14.30	11.40	14.00	7.61	11.50	9.63
D	28.80	33.60	21.20	29.50	28.40	29.70	30.50
E	40.80	45.20	25.60	37.90	45.50	43.50	48.30
F	11.60	14.10	14.00	11.90	4.94	12.90	12.80
G	15.10	19.50	14.70	16.80	8.09	20.40	18.50
H	31.30	26.00	23.80	25.40	15.80	30.60	32.80
I	339.00	129.00	91.20	109.00	181.00	126.00	246.00
J	93.80	54.40	31.00	42.60	32.40	44.60	54.90
K	49.80	36.30	26.20	27.80	13.90	28.40	40.70
L	16.90	22.60	6.08	8.31	5.59	14.10	14.30
M	133.00	65.00	46.30	73.50	142.00	73.30	119.00
N	9.81	9.97	9.68	11.60	7.56	9.62	10.20

## APPENDIX C

Geometric means of the magnitude estimations for the fourteen index offences judged by Canadian students of *both sexes* in each province and by other special group

Offence descriptions	Canada (national)	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec (McGill)
A	5.69	8.08	6.39	6.07	6.17	6.54	6.46
B	8.85	11.40	9.59	9.72	8.57	9.32	10.10
C	11.53	13.30	12.80	13.00	9.94	12.00	12.40
D	23.95	23.80	22.80	26.60	21.00	20.70	26.50
E	31.87	28.30	31.50	32.40	25.70	27.10	32.70
F	12.73	14.90	12.50	13.80	12.20	12.80	16.00
G	19.11	25.30	21.80	21.30	20.10	19.10	22.20
H	29.91	34.10	32.20	30.70	27.50	29.00	38.40
I	196.86	183.00	151.00	126.00	216.50	234.00	300.00
J	49.06	51.30	39.30	47.50	50.30	43.70	63.30
K	32.55	34.80	31.50	32.70	31.80	31.80	41.50
L	13.90	12.60	9.53	10.80	14.30	17.00	11.30
M	84.42	88.50	79.30	79.10	79.60	91.50	124.00
N	10.39	11.10	11.11	11.20	10.50	10.90	11.70

## APPENDIX C (continued)

Offence descriptions	Quebec (Montreal)	Quebec (Laval)	New Brunswick (Fredericton)	Nova Scotia	Prince Edward Island	Newfoundland	Other special group: Quebec (Montreal/pilot)
A	2.63	4.15	5.49	5.85	3.25	8.88	2.77
B	5.82	8.39	8.85	9.21	6.37	13.00	6.44
C	8.64	12.20	10.50	11.80	9.30	15.50	8.64
D	31.00	28.50	21.40	23.90	30.30	32.80	29.50
E	45.20	40.80	24.20	26.60	46.30	45.70	45.40
F	12.50	12.40	12.60	11.50	7.66	15.90	8.78
G	18.20	16.60	15.30	16.10	10.50	24.40	17.30
H	37.20	24.80	27.00	28.90	19.70	34.90	34.40
I	361.00	120.00	124.00	136.00	177.00	122.00	333.00
J	88.30	41.50	34.00	47.70	34.50	43.20	50.10
K	46.60	28.10	24.35	31.80	17.30	28.50	26.30
L	15.30	17.20	5.51	7.69	4.71	12.00	8.86
M	115.00	54.50	52.70	78.30	94.00	71.80	132.00
N	9.59	9.92	9.83	10.40	9.33	11.30	9.17

## APPENDIX D

Medians of the magnitude estimations for the fourteen index offences judged by  
Canadian *male* students in each province and by other special groups

Offence descriptions	Canada (all males)	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec (McGill)
A	8.62	10.99	10.46	9.67	10.27	9.95	9.87
B	11.77	12.99	12.22	12.33	11.21	10.87	12.30
C	13.57	13.71	13.37	14.31	12.46	12.69	13.07
D	24.69	21.79	23.11	23.85	22.46	20.59	22.70
E	33.07	24.52	26.21	28.71	25.79	21.96	26.21
F	15.88	15.27	15.17	14.70	14.02	13.00	20.19
G	22.70	25.59	23.17	24.58	22.77	19.95	26.21
H	32.68	32.91	31.87	34.34	29.34	24.95	44.95
I	103.67	102.98	102.83	102.28	103.00	104.46	202.46
J	48.85	50.41	43.82	43.96	50.38	44.95	54.37
K	30.52	30.46	31.92	31.39	31.84	34.95	50.22
L	13.33	17.04	13.55	18.71	17.46	18.71	14.95
M	64.53	100.54	74.71	64.95	72.46	64.96	101.00
N	12.73	12.76	12.84	10.23	12.89	12.16	12.89



## APPENDIX D (continued)

Offence descriptions	Quebec (Montreal)	Quebec (Laval)	New Brunswick (Fredericton)	Nova Scotia	Prince Edward Island	Newfoundland	New Brunswick (Moncton)
A	6.59	6.32	9.83	10.90	5.75	13.82	6.86
B	10.67	10.89	11.90	11.90	10.13	21.21	11.56
C	13.98	13.46	12.71	13.37	12.61	22.46	13.87
D	31.77	23.71	23.71	24.34	30.79	24.60	34.46
E	51.21	35.79	22.46	31.21	51.07	52.46	54.46
F	19.19	13.92	13.84	13.09	14.81	22.71	17.46
G	24.03	17.74	20.21	25.59	18.21	30.90	18.14
H	50.24	24.43	31.75	40.59	23.79	41.84	31.68
I	187.46	101.61	103.34	103.92	104.04	102.93	103.13
J	62.77	32.69	40.96	53.46	40.32	51.46	40.79
K	42.46	23.46	24.40	50.59	21.69	28.17	22.18
L	21.41	16.39	9.13	9.21	6.67	12.46	9.83
M	92.46	42.10	60.79	92.46	54.27	100.14	52.46
N	12.53	12.39	12.59	12.70	12.86	13.55	12.61

## APPENDIX D (continued)

Offence descriptions	Judges (French)	Other special groups		White-collar workers	Quebec (Montreal/pilot)
		Judges (English)	Police (Montreal/French)		
A	6.21	9.29	11.85	11.78	6.63
B	7.46	11.02	12.57	12.23	10.56
C	9.95	12.46	12.98	13.71	13.90
D	29.95	30.21	22.85	22.46	34.68
E	44.95	34.19	24.84	24.60	54.61
F	42.46	30.54	31.63	19.95	19.86
G	51.21	41.46	44.71	39.95	24.20
H	64.95	63.02	70.59	53.29	50.74
I	104.25	102.98	102.09	103.14	184.37
J	52.46	44.95	51.78	53.09	62.47
K	29.95	24.74	25.90	41.63	42.40
L	19.95	13.23	24.38	20.79	29.32
M	101.32	100.42	84.28	101.21	59.91
N	12.46	12.59	12.64	13.77	12.57

## APPENDIX E

Medians of the magnitude estimations for the fourteen index offences judged by Canadian *female* students in each province and by other special group

Offence descriptions	Canada (all females)	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec (McGill)
A	10.29	11.43	9.13	10.25	10.67	11.56	11.34
B	12.73	13.25	11.86	12.46	12.77	12.09	12.46
C	15.01	15.46	14.74	14.95	14.60	15.71	15.79
D	27.46	29.95	29.95	31.21	23.84	23.14	32.15
E	34.27	32.74	33.37	43.71	32.46	26.63	34.79
F	16.90	19.46	14.27	16.46	16.71	16.50	20.54
G	22.21	28.47	21.05	22.06	22.15	22.29	22.26
H	30.72	38.71	27.10	25.79	28.09	29.95	31.87
I	103.40	102.91	102.83	102.99	102.89	104.84	104.70
J	53.04	54.95	48.29	52.82	53.96	53.85	61.21
K	36.52	44.25	33.96	33.58	41.63	43.36	43.85
L	19.86	21.35	17.21	16.21	19.95	24.52	20.32
M	100.09	100.57	100.19	100.39	84.95	101.63	100.42
N	12.87	12.73	13.07	13.14	12.80	12.99	13.17

## APPENDIX E (continued)

Offence descriptions	Quebec (Montreal)	Quebec (Laval)	New Brunswick (Fredericton)	Nova Scotia	Prince Edward Island	Newfoundland	Other special group : Quebec (Montreal/pilot)
A	4.77	9.68	9.13	9.09	4.95	9.95	4.80
B	10.90	12.25	11.75	12.31	7.46	12.74	10.79
C	13.29	17.46	12.04	15.67	11.21	18.09	13.32
D	24.54	32.46	22.46	30.71	29.95	30.96	24.76
E	33.96	43.46	31.21	34.34	34.95	52.46	34.11
F	14.95	17.21	12.46	13.29	7.46	14.54	15.35
G	22.46	24.60	23.71	21.78	16.63	21.88	22.66
H	24.95	31.52	32.71	28.71	26.46	31.78	25.45
I	179.96	102.67	100.90	97.66	102.46	102.65	176.56
J	94.95	53.17	34.13	43.96	34.95	51.03	94.75
K	51.21	33.71	31.46	32.74	24.95	26.69	51.09
L	22.87	27.46	10.79	14.95	9.95	16.21	22.79
M	102.82	54.71	53.71	73.29	54.95	79.95	102.27
N	12.54	12.46	12.46	13.09	11.21	12.40	12.40

## APPENDIX F

Medians of the magnitude estimations for the fourteen index offences judged by Canadian students of *both sexes* in each province and by other special group

Offence descriptions	Canada (all students)	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec (McGill)
A	9.38	11.28	9.74	10.02	10.56	10.94	10.72
B	12.26	13.16	12.06	12.36	12.60	12.80	13.09
C	14.22	14.56	13.93	14.69	14.23	14.76	14.09
D	25.22	23.82	24.11	26.52	23.35	22.46	24.82
E	33.50	30.12	30.50	32.79	29.65	24.59	31.81
F	15.94	17.60	14.66	15.40	15.70	14.85	20.38
G	22.39	24.38	22.19	22.92	22.36	22.08	23.56
H	31.70	34.36	30.41	31.75	28.50	29.95	34.95
I	103.53	102.94	103.85	102.62	102.93	104.86	106.00
J	51.59	53.16	39.84	51.31	52.01	52.76	54.95
K	32.91	40.90	32.98	32.70	33.71	42.65	44.71
L	15.92	20.30	15.38	17.09	18.85	23.71	18.78
M	81.25	100.59	82.46	91.21	82.46	101.06	100.65
N	12.79	12.76	12.94	13.01	12.83	12.87	13.01

## APPENDIX F (continued)

Offence descriptions	Quebec (Montreal)	Quebec (Laval)	New Brunswick (Fredericton)	Nova Scotia	Prince Edward Island	Newfoundland	Other special group : Quebec (Montreal/pilot)
A	6.27	6.98	9.65	9.60	5.79	11.53	6.35
B	10.82	11.31	11.86	12.27	9.95	13.94	10.59
C	13.74	14.44	12.56	14.58	12.72	20.10	13.80
D	30.96	24.43	23.02	25.87	30.71	33.09	31.40
E	51.31	39.13	22.91	33.96	50.87	52.46	51.69
F	18.40	14.81	13.55	13.29	13.99	19.95	18.21
G	23.73	19.98	20.59	23.29	17.85	23.99	24.01
H	43.11	26.53	31.71	31.21	23.64	33.00	44.07
I	186.79	101.24	102.91	103.02	104.00	103.00	179.58
J	71.21	39.95	40.32	50.84	39.95	51.14	70.71
K	43.29	26.32	24.75	30.46	21.92	27.34	43.56
L	21.72	18.85	9.46	13.14	7.24	14.44	21.51
M	100.65	50.85	54.65	81.21	54.39	82.77	101.64
N	12.52	12.39	12.56	13.00	12.71	12.79	12.49

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## ABSTRACTS

## MESURE DE LA DÉLINQUANCE AU CANADA

« Mesure de la délinquance au Canada » présente les résultats définitifs d'une réplique méthodologique de l'étude de T. Sellin et M.E. Wolfgang qui ont validé, il y a quelques années, un indice de la criminalité pour les États-Unis. Le but de la présente recherche vise à mettre au point un indice semblable pour le Canada.

Le Bureau fédéral de la statistique est responsable de la compilation des statistiques criminelles canadiennes. Ces statistiques sont basées sur les rapports annuels des différents corps de police du Canada et la classification des crimes est semblable, dans l'ensemble, au système américain communément appelé *Uniform Crime Reporting*.

Ce système ne tient pas compte, toutefois, de la *gravité relative* des différentes violations de la loi. Cette carence biaise toute analyse de l'étendue et de la nature de la criminalité dans le temps et dans l'espace. C'est ce qui détermina Sellin et Wolfgang, ainsi que les auteurs de la présente étude, à y remédier.

L'objectif principal de la recherche est la quantification des éléments qualitatifs inhérents aux événements criminels. Aux États-Unis, un système pondéré, fruit de l'analyse des attitudes caractérisant des échantillons d'étudiants universitaires, de policiers et de juges de la Cour juvénile, servit à cette fin.

La stratégie de la présente étude repose sur un « modèle de réplique minimum ». Ce modèle, légitimé par la validité des résultats, des interprétations et des conclusions de la recherche de Sellin et Wolfgang, reprend le dernier stade — qui est aussi le plus essentiel — de l'étude originale. Quatorze versions de délits criminels sont alors retenues afin de développer l'indice final.

Les postulats de base qui sous-tendent cet indice sont les suivants:

1) La mesure de la criminalité et de la délinquance juvénile doit être fondée sur une échelle de gravité qui reflète les sentiments de la communauté sur la gravité relative des différents délits criminels.

2) L'indice doit être élaboré à partir de renseignements détaillés, tirés des rapports de police et non à partir des étiquettes légales qui sont apposées aux événements criminels.

3) En ce qui concerne la délinquance juvénile: a) les délits commis par les jeunes délinquants le sont indépendamment du type de cours ou de procédés qui mènent à leur jugement; b) l'indice ne doit tenir compte que des violations qui seraient considérées comme criminelles si ces jeunes délinquants étaient des adultes.

4) L'indice doit être fondé sur les délits criminels qui sont de nature à amener rapidement les victimes ou leurs proches à rapporter lesdits événements à la police.

5) L'indice doit être fondé sur les délits qui sont rapportés d'une façon un tant soit peu constante et qui causent un préjudice explicite aux membres de la communauté, tels que les blessures corporelles, le vol et la perte des biens ou les dommages à la propriété. L'indice exclut: a) les délits impliquant le consentement de la victime et la conspiration; b) les délits dont la découverte dépend surtout de l'activité de la police; c) les délits qui ne sont que des attentats ne produisant aucun dommage corporel ou matériel.

6) L'unité de compilation doit être l'« événement » pris dans sa totalité et non un seul élément, si important soit-il.

7) Une échelle de proportions (*ratio*) est la plus appropriée, particulièrement en cause de la qualité cumulative d'une telle échelle.

8) Des variables supposément importantes — telles que le type d'armes ou la légalité de la présence du coupable — n'accroissent pas la gravité des délits et n'entrent donc pas en ligne de compte.

L'échantillon canadien est de 2 738 sujets. Des étudiants, des juges, des policiers et des employés de bureau ont participé à cette étude.

Las métodos y las técnicas empleadas fueron empruntadas al dominio de la psicofísica, particularmente a los trabajos de S.S. Stevens, de la Universidad de Harvard. Estos trabajos establecen una relación matemática entre « estímulo » y « percepción ».

Cada sujeto recibió las quince descripciones de delitos criminales a los cuales se le asignaron pesos numéricos que varían según sus actitudes particulares. Estos resultados numéricos fueron compilados con la ayuda de la media geométrica y analizados por los métodos de correlación ( $r$ ) y de regresión ( $b$ ).

Las hipótesis principales de Sellin y Wolfgang, sobre la base de estos resultados, fueron reformuladas de la siguiente manera:

#### *Expectative minimum*

Si los índices de gravedad de los delitos tomados de dos poblaciones (sexo, cultura, país) son confrontados, la relación que existe entre ellos debe ser una función que tenga la forma  $Y = aX^b$  (los puntos trazados gráficamente sobre papel log-log se sitúan sobre una línea recta). Es evidente que esta expectativa no se aplica a los delitos seleccionados por Sellin y Wolfgang.

#### *Expectative maximum*

Si los índices de gravedad de los delitos tomados de un gran número de poblaciones o de sub-poblaciones (especialmente en el interior de un país) son comparados, la relación que se forma entre ellos es una función que tenga la forma  $Y = aX^b$  (los puntos trazados gráficamente sobre papel log-log se sitúan sobre una línea recta); de más, a medida que el número de grupos en la muestra aumenta, la pendiente tiende a 1. De nuevo, esto no se aplica a los delitos seleccionados.

Los resultados de esta investigación confirman la fiabilidad y la estabilidad del índice de Sellin y Wolfgang. Ellos permiten la elaboración de un índice canadiense de gravedad de los delitos que constituye una medida refinada de la criminalidad y de la delincuencia juvenil, capaz de reemplazar ventajosamente la utilizada actualmente en Canadá.

## LA MEDIDA DE LA DELINCUENCIA EN EL CANADA

« La medida de la delincuencia en el Canadá » presenta los resultados definitivos de una réplica metodológica del estudio realizado hace unos años por T. Sellin y M.E. Wolfgang sobre el establecimiento de un índice de la criminalidad e intenta poner a punto un índice análogo para el Canadá.

La Oficina Federal de Estadística es responsable de la compilación de las estadísticas criminales canadienses, que se basan en los informes anuales de los diversos cuerpos de policía del país; en general, la clasificación de las infracciones es bastante parecida al sistema americano comúnmente denominado *Uniform Crime Reporting*.

Sin embargo, dicho sistema no tiene en cuenta la *gravedad relativa* de las diferentes formas de violación de la ley. Esta carencia falsea cualquier análisis que pudiera efectuarse de la extensión y naturaleza de la criminalidad en el tiempo y en el espacio. Esta circunstancia ha inducido a Sellin y Wolfgang, así como a los autores de la investigación presente, a poner remedio a esta situación.

Se trata pues de intentar cuantificar los elementos cualitativos inherentes a los hechos criminales. Un sistema equilibrado, fruto del análisis de las actitudes que caracterizan a un grupo-piloto de estudiantes universitarios, policías y jueces de menores, sirvió para este fin en Estados Unidos.

La estrategia del estudio presente reposa en un « modelo mínimo de réplica » que, legitimado por la validez de los resultados, interpretaciones y conclusiones de la investigación de Sellin y Wolfgang, vuelve a examinar la última fase — la más esencial de todas — del estudio original. Catorce tipos de delitos han sido seleccionados con objeto de construir el índice final.

Los postulados de base implícitos en dicho índice son los siguientes:

1) La medida de la criminalidad y de la delincuencia juvenil debe fundarse en una escala de gravedad que refleje los sentimientos de la comunidad sobre la gravedad relativa de las diversas infracciones.

2) El índice debe elaborarse a partir de datos detallados obtenidos de los informes de la policía y no a partir de simples etiquetas legales aplicadas a los hechos delictuosos.

3) Por lo que se refiere a la delincuencia juvenil: a) los delitos cometidos por los jóvenes delincuentes lo son independientemente del tipo de tribunal o de procedimiento seguido; b) el índice no debe tener en cuenta más que las violaciones de la ley que serían consideradas como criminales si dichos jóvenes fueran adultos.

4) El índice debe fundarse en los delitos susceptibles de persuadir rápidamente a la víctima o a sus familiares para que denuncien dichos actos a la policía.

5) El índice debe basarse asimismo en los delitos señalados de manera constante y que causan un perjuicio exterior a los miembros de la comunidad, como heridas corporales, robos, pérdidas de bienes, daños a la propiedad, etc. Quedan pues excluidos: a) los delitos que suponen el consentimiento de la víctima; b) los delitos cuyo descubrimiento depende esencialmente de la actividad de la policía; c) las simples tentativas no acompañadas de daños materiales o corporales.

6) La unidad de compilación debe ser el « hecho » considerado en su totalidad y no un solo elemento, por importante que sea.

7) Una escala de proporciones (*ratio*) sería la más adecuada, especialmente a causa de la calidad cumulativa de tal escala.

8) Ciertas variables aparentemente importantes, como el tipo de arma o la legalidad de la presencia del culpable, no aumentan la gravedad de la infracción y por consiguiente no deben entrar en consideración.

La muestra canadiense se compone de 2738 individuos: estudiantes, jueces, policías y empleados de oficina.

Los métodos y técnicas empleados han sido tomados de la sicofísica, en especial de los trabajos de S.S. Stevens, de la Universidad de Harvard, en que se establece una relación matemática entre « estímulo » y « percepción ».

Cada individuo recibió las catorce descripciones de delitos y les atribuyó un valor expresado en números. Los resultados numéricos fueron compilados con ayuda de la media geométrica y analizados según los métodos de correlación (*r*) y regresión (*b*).

Apoyándose en dichos resultados, las principales hipótesis de Sellin y Wolfgang fueron reformuladas de la manera siguiente:

#### *Expectativa mínima*

Si comparamos los índices de gravedad de delitos obtenidos de dos tipos de población (sexo, cultura, país), la relación existente entre ellos será la función  $Y = aX^b$  (los puntos trazados gráficamente en papel log-log se sitúan en una línea recta). Es evidente que esta expectativa sólo se aplica a los delitos escogidos por Sellin y Wolfgang.

#### *Expectativa máxima*

Si la comparación se efectúa entre índices de gravedad de delitos procedentes de un gran número de poblaciones o subpoblaciones (especialmente en el interior de un mismo país), la relación podrá ser representada por la función  $Y = aX^b$  (los puntos trazados gráficamente en papel log-log se sitúan en una línea recta). A medida que el número de grupos en la muestra aumenta, la pendiente tenderá hacia 1. Como en el caso anterior, todo esto sólo se aplica a los delitos seleccionados por los criminólogos americanos.

Los resultados del estudio presente confirman pues la fiabilidad y estabilidad del índice de Sellin y Wolfgang y autorizan la elaboración de un índice canadiense de gravedad de delitos que constituiría una medida refinada de la criminalidad y de la delincuencia juvenil y podría reemplazar ventajosamente los métodos de mensuración empleados actualmente.

## INDEX DER KRIMINALITÄT IN KANADA

Der Index der Kriminalität in Kanada ist das Ergebnis einer metho-

dologischen Erwiderung zur Studie von T. Sellin und M.E. Wolfgang, welche vor einigen Jahren einen gültigen Index für die Kriminalität gebracht haben. Das Ziel der vorliegenden Untersuchung ist, einen ähnlichen Index für Kanada aufzustellen.

In Kanada ist das *Federal Bureau of Statistics* (Federele Büro der Statistik) für die Aufstellung der Kriminalitätsstatistiken in Kanada verantwortlich. Diese Statistiken beruhen auf den jährlichen Angaben der verschiedenen Kanadischen Polizeikörperschaften, und die Verbrechen sind meistens wie im Amerikanischen *Uniform Crime Reporting System* klassifiziert.

Dieses System nimmt aber nicht die *relative Schwere* der verschiedenen Delikte in Betracht, was jede Studie über den zeitlichen und den räumlichen Umfang der Kriminalität und ihre Natur verfälscht. Deshalb beschlossen Sellin und Wolfgang, sowie die Verfasser der vorliegenden Studie, diesem Mangel abzuhelfen.

Das Hauptziel dieser Untersuchung ist, das Messen der qualitativen Elemente in kriminellen Handlungen zu quantifizieren. In den Vereinigten Staaten wurde zu diesem Zweck ein ernsthaft ausgedachtes System verwendet, Ergebnis einer Untersuchung der charakteristischen Einstellung von Stichprobesubjekten, die unter Universitätsstudenten, Polizisten und Jugendrichtern gesammelt wurden.

Die Strategie der vorliegenden Untersuchung besteht aus einem « Modell der minimalen Antwort ». Dieses Modell, das durch die gültigen Ergebnisse, Interpretationen und Schlussfolgerungen der Forschung von Sellin und Wolfgang legitimiert worden ist, nimmt wieder den letzten Teil, der gleichzeitig auch der wichtigste der Originalstudie ist, auf. Vierzehn verschiedene Auffassungen krimineller Handlungen sind aufgestellt worden, um den endgültigen Index zu erreichen.

Die Hauptpostulate, die diesem Index unterliegen, sind die folgenden:

1) Der Index der Kriminalität und der Jugendkriminalität sollte sich auf einer Gradeinteilung der Schwere gründen, die die Gefühle der Gemeinschaft bezüglich der verschiedenen Delikte wiederspiegelt.

2) Der Index sollte auf Grund der genauen Angaben aus den polizeilichen Berichten bearbeitet werden, und nicht ab gerichtlicher Etiketten, die kriminellen Geschehen angehängt werden.

3) Bezüglich der Jugendkriminalität: a) Die Delikte, die von Jugendlichen begangen werden, sind solche, ganz abgesehen davon vor welchem Gericht oder durch welche Verfahren sie verurteilt werden; b) Der Index muss nur jene Handlungen in Betracht ziehen, die als kriminell angesehen würden, falls diese jugendlichen Täter Erwachsene wären.

4) Der Index muss auf jenen Verbrechen gegründet sein, die wegen ihrer Natur ihre Opfer oder deren Nahestehenden zu einem schnellen Bericht an die Polizei bewegen.

5) Der Index muss ebenfalls auf jenen Verbrechen beruhen, über welche mit relativer Beständigkeit berichtet wird, und welche Mitgliedern der Gemeinschaft einen ausdrücklichen Schaden gebracht haben, wie Körperverletzungen, Diebstahl und Güterverlust, oder Eigentumsschaden. Sind ausgeschlossen: a) Jenes Delikt welches mit der Einwilligung des Opfers und mit seiner Mitwirkung begangen worden ist; b) die Delikte deren Entdeckung von polizeiliche Bemühungen abhängig ist; c) die Delikte, die nur Angriffe sind, ohne körperliche oder materielle Schaden zu verursachen.

6) Die Kompilationseinheit muss das « Geschehen » in seiner Gesamtheit, und nicht ein Einzelbestandteil dessen sein, so wichtig es auch sein mag.

7) Eine Abstufung der Proportionen (*ratio*) ist am besten geeignet, vor allem wegen der kumulierenden Beschaffenheit einer solchen Gradeinteilung.

8) Scheinbar wichtige Unterschiedlichkeiten ~ wie die Art der Waffe oder die berechnigte Anwesenheit des Schuldigen ~ tragen nicht der Schwere des Deliktes bei und sind deshalb nicht in Betracht gezogen.

Die Kanadische Stichprobe zählt 2738 Personen, Studenten, Richter,

Polizisten und Bürobeamte haben an dieser Studie teilgenommen.

Die angewandten Methoden und Techniken wurden dem Gebiete der Psychophysik, insbesondere der Arbeiten von S.S. Stevens der Universität Harvard, entliehen. Diese Arbeiten stellen ein mathematisches Verhältnis zwischen « Stimulus » und « Wahrnehmung » auf.

Die vierzehn Auffassungen krimineller Handlungen wurden allen diesen Personen vorgelegt, und sie fügten jeder Beschreibung eine Nummer an, die dem bestimmten Gewicht, welches sie dem Verbrechen gaben, entsprach. Diese numerische Resultate wurden mit Hilfe der geometrischen Durchschnittsberechnung zusammengetragen und durch Wechselbeziehung ( $r$ ) und Regressionsmethoden ( $b$ ) analysiert.

Die Haupthypothesen von Sellin und Wolfgang wurden auf Grund dieser Resultate hin folgendermassen neu formuliert:

#### *Minimale Aussicht*

Wenn man die Angaben auf die Schwere der Delikte aus zwei verschiedenen Bevölkerungen (Geschlecht, Kultur, Land) vergleicht, muss die Beziehung, die zwischen ihnen besteht, eine Funktion mit der Form  $Y = aX^b$  sein (die Punkte auf dem Logarithmenpapier erscheinen in gerader Linie). Natürlich ist diese Erwartung nur für die Delikte, die von Sellin und Wolfgang ausgesucht worden sind, gültig.

#### *Maximale Aussicht*

Wenn die Angaben in Bezug auf die Schwere der Delikte, welche aus einer grossen Anzahl von Bevölkerungen oder Unterbevölkerungen entnommen werden (besonders binnen eines einzigen Landes), sich gegenübergestellt werden, bildet sich ein Verhältnis zwischen ihnen, welches eine Funktion mit der Form  $Y = aX^b$  ist (die Punkte auf dem Logarithmenpapier erscheinen in gerader Linie); ferner neigt die Linie immer mehr gegen  $I$ , je mehr die Zahl der Gruppen binnen der Stichprobe zunimmt. Wiederum stimmt dies nur für die ausgewählten Verbrechen.

Die Ergebnisse dieser Studie bestätigen die Verlässlichkeit und Stabilität von Sellins und Wolfgangs System zur Einschätzung der Schwere der Verbrechen. Es würde ein zuverlässiges Messinstrument für Jugendkriminalität abgeben, das vorteilhaft das jetzt in Kanada vorhandene System ersetzen würde.

## ИЗМЕРЕНИЕ ПРЕСТУПНОСТИ В КАНАДЕ

Настоящее исследование является соответствующим исследованию Селлина и Вольфганга, и преследует цель разработки подобных указателей на территории Канады. Федеральное Статистическое Бюро является ответственным за совокуюшение всех статистических данных со всей Канады.

Эти данные базируются на годовых отчетах различных родов Канадской полиции, а классификация преступлений проводится таким же образом как и в Северо-Американских Соединенных Штатах, **Uniform Crime Reporting**.

Главным предметом исследования, является прежде всего количественная интерпретация, качественных элементов находящихся в самом преступлении.

Основами на которых базируются исследования, могут быть, ниже следующие:

1) Измерение преступлений совершенных взрослыми и малолетними, должно содержать определение степени вреда принесенного самим преступлением.

2) Указатель должен быть разработан точно, и касаться деталей подчёркнутых в полицейских отчетах.

3) Касательно малолетних преступников, очень важную роль играет сама судебная процедура и способ совершения преступления, например: при участии взрослых.

4) Указатель должен также базироваться на заявлениях самой жертвы преступления, в полиции.

5) Необходимо также указать каким способом преступление было совершено.

6) Описание всего преступления, должно в себе содержать правдивые и точные детали.

7) Очень важным является указатель пропорции (*ratio*).

8) Очень важна также и роль изменителей.

Настоящие результаты содержащиеся гипотетически в границах ожидаемого "минимума" и "максимума", указывают на постоянство указателя, упомянутого Селлином и Вольфгангом.

Настоящие результаты позволяют разработать канадский указатель вреда принесенного преступлением, что является очень важным фактором, для дальнейших, точных криминологических исследований.

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