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**EVIDENCE-BASED CRIME PREVENTION:
SCIENTIFIC BASIS, TRENDS, RESULTS AND
IMPLICATIONS FOR CANADA**

Brandon C. Welsh, PhD.

Research Report: 2007-1

RESEARCH REPORTS

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La présente publication est aussi disponible en français. Elle s'intitule : L'approche scientifique en prévention du crime : fondements, tendances, résultats et implications pour le Canada.

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EXECUTIVE SUMMARY

Crime prevention should be rational and should be based on the best possible evidence. One would expect decision-makers to weigh heavily any available evidence on what works. How can a program that has produced no discernable evidence of effectiveness in numerous evaluations be considered for implementation?

Selecting and implementing new crime prevention programs, expanding effective programs or putting an end to ineffective or harmful ones involves many considerations. For example, the government may have different priorities, such as military defence spending, environmental protection, or health care, which are competing for scarce public resources. National polls may show that the public is concerned with policy issues other than crime prevention. Regrettably, evidence of what works best seems to rarely be a factor in implementing new crime prevention programs. Instead, political and policy considerations often dominate.

Evidence-based crime prevention ensures that the best available evidence is considered in the decision to implement a program designed to prevent crime. Support for evidence-based crime prevention is growing. This growth has been fostered by a number of recent developments, including a movement toward an evidence-based approach in other disciplines, such as medicine and education; large-scale government – and foundation – sponsored reviews of “what works” in crime prevention; and, most recently, the establishment of the Campbell Collaboration and its Crime and Justice Group.

This report reviews the current state of evidence-based crime prevention and explores implications for Canada’s crime prevention efforts. To complete this task a number of key questions are addressed:

- a) What is the scientific foundation of the evidence-based model? How is the evidence-based model applicable to crime prevention?
- b) Is there an institutional foundation for evidence-based crime prevention? What are some of the key developments in evidence-based crime prevention in selected Western countries?
- c) What is the state of science on what works to prevent crime?
- d) What are the main challenges of evidence-based crime prevention?
- e) What are some of the key implications of other countries’ evidence-based crime prevention for Canada, specifically for its National Crime Prevention Strategy (NCPS) and National Crime Prevention Centre (NCPC)?

The Evidence-Based Model and Crime Prevention

Within the evidence-based paradigm, drawing conclusions based on facts calls attention to two fundamental issues:

- a) The validity of the evidence;
- b) The methods used to locate, appraise, and synthesize the evidence.

The evaluation of a crime prevention program is considered to be high quality if it possesses a high degree of internal, construct, and statistical conclusion validity. Put another way, one can have a great deal of confidence in the observed effects of an intervention if it has been evaluated with a design that controls for the major threats to these three forms of validity. Experimental (randomized and non-randomized) and quasi-experimental research designs are the types of evaluation designs that can best achieve this.

The Randomized Controlled Experiment

The randomized controlled experiment is considered the “gold standard” in evaluation research designs. Randomization is the only method of assignment that controls for unknown and unmeasured confounders as well as for those that are known and measured. However, to be the most convincing evaluation method, the randomized experiment must be implemented with full integrity. In area-based studies, the best and most feasible design usually involves before and after measures, in experimental and comparable control conditions, together with statistical control of extraneous variables.

Just as it is crucial to use the highest quality evaluation designs to investigate the effects of crime prevention programs, it is equally important to use the most rigorous methods to assess the available research evidence. Efforts to assess if a particular crime prevention strategy, intervention modality, or some other feature of crime prevention programs effective can take many forms. The main types of review methodology include the single study, narrative, vote-count, systematic, and meta-analytic reviews.

The Systematic Review and the Meta-Analytic Review

The systematic review and the meta-analytic review are the most rigorous methods for assessing the effectiveness of criminological interventions. Systematic reviews use rigorous methods for locating, appraising, and synthesizing evidence from prior evaluation studies, and they report results with the level of detail that characterizes high quality research reports. Meta-analyses involve the statistical or quantitative analysis of the results of prior research studies, and are often used in systematic reviews.

The State of Science on What Works to Prevent Crime

Research on “what works” in preventing crime has long been of interest to practitioners, policy-makers, and academics alike. Only in recent years, however, has there been an increased effort to improve the trustworthiness of claims about what works in preventing crime. This has come about through the use of the highest quality scientific evidence and the most rigorous and transparent review methods to assess what works. It has come to form the state of science on evidence-based crime prevention.

Family-Based Prevention

Five types of family-based programs have been found to be effective in preventing crime:

- Home visitation;
- Day care/preschool;
- Parent training (with younger children);
- Home/community parent training (with older children);
- Multisystemic therapy.

Community-Based Prevention

Three types of community-based programs are considered to be promising in preventing crime:

- Gang member intervention programs that are focused on reducing cohesion among youth gangs and individual gang members;
- Community-based mentoring;
- After-school recreation.

School-Based Prevention

Three types of school-based programs have been found to be effective in preventing crime:

- School and discipline management;
- Interventions to establish norms or expectations for behavior;
- Self-control or social competency instruction using cognitive-behavioral instruction methods.

Place-Focused Prevention

Three types of place-focused programs have been found to be effective in preventing crime:

- Nuisance abatement;
- Closed-circuit television surveillance cameras;
- Improved street lighting.

International Developments

In recent years, a number of important developments have fostered evidence-based crime prevention. For the most part, these developments have involved efforts to advance the science of evaluation research and review methodology. They have also involved assessments of the available scientific evidence on what works best, whether these were large-scale reviews or ones that were more narrowly focused on a particular crime prevention measure (e.g., Does mentoring work?) or crime type (e.g., What works to reduce repeat residential burglary victimization?). Fewer efforts have been carried out to bridge research with policy or practice, whether this involved studying the utilization of results from evidence-based research, or using evidence-based research to bring about policy change. The latter may not be all that surprising considering that an evidence-based approach to the prevention of crime is still relatively new.

The Campbell Collaboration Crime and Justice Group is at the forefront of the development of evidence-based crime prevention internationally. The Group's broad mission is to oversee the preparation, maintenance, and dissemination of systematic reviews of the highest quality research on the effects of criminological interventions. Reviews are focused on interventions designed to prevent delinquency or crime (presently the main focus), as well as those attempting to improve the management or operations of the criminal justice system.

The U.S. and international interest in an evidence-based approach to preventing crime began with the release of the now famous 1997 Report to the U.S. Congress, *Preventing Crime: What Works, What Doesn't, What's Promising*, by Lawrence Sherman and his colleagues. Unlike any other country in the world, the U.S. maintains a program of research to evaluate crime prevention programs benefiting at-risk populations, using the most rigorous evaluation designs. This is the backbone of evidence-based crime prevention.

In England and Wales, the Crime Reduction Programme (CRP), which ran from 1999 to 2002, was the central organizing body for evidence-led initiatives. While reviews on the CRP's effectiveness are mixed, evidence-based crime prevention has maintained a role in British policy. Since the end of the program, there has been support for the use of what works to prevent crime based on research evidence and for high quality evaluations of crime prevention programs.

Similarly, Australia's efforts to advance evidence-based crime prevention have been innovative and wide-ranging. In recent years, Australia has seen a trend toward the use of higher quality evaluation designs, including randomized controlled experiments, to assess the impact of crime prevention programs.

Challenges

Evidence-based crime prevention is, of course, not without its challenges. Several substantive and practical challenges prevent the evidence-based model from reducing

crime more effectively. One challenge is implementation and the ability to tailor evidence about what works best to local context and conditions. Another challenge is the acceptance of the evidence-based model by decision-makers, and a third is utilization of evidence-based research by practitioners.

Implications for Canada

The National Crime Prevention Strategy (NCPS) and National Crime Prevention Centre (NCPC) should continue to support international organizations in order to learn about and contribute to what works. Support for the Campbell Crime and Justice Group helped foster new systematic reviews that may be relevant to the Canadian situation. These may furnish Canadian policy-makers and practitioners with insights on program content, training needs, and delivery, in addition to results. The NCPC should also commission new systematic reviews on the types of crime prevention measures that are specific to the Canadian situation.

A Canadian system of new crime prevention programs incorporating high quality evaluation designs is needed in order to create a foundation for evidence-based crime prevention now and in the long run. These new crime prevention programs should be selected so that they contribute to scientific evidence presently deemed insufficient, such as in the area of promising practices, or as part of a program of replications to test effective practices with different populations and in different regions of the country. As part of the original research design, experiments and quasi-experiments should include large samples, long follow-up periods, follow-up interviews, and provision for an economic analysis.

Funding decisions need to be guided by evidence on what works best. The present state of scientific evidence from systematic reviews and other high quality review methods – that may or may not include Canadian evaluations – is immediately accessible, and it is the most robust source to aid in decision-making about what types of crime prevention programs should be funded by NCPC.

A Canadian research program needs to be initiated to understand how scientific evidence on what works best can be incorporated into crime prevention policy and practice. Learning from the lessons of new research in the U.S. will also be helpful, but it will be important to understand the specific needs of Canadian crime prevention practitioners, as well as the relationships among the scientific community (and the research evidence they produce), policy-makers, and practitioners.

INTRODUCTION

Crime prevention should be rational and based on the best possible evidence. One would expect decision-makers to weigh heavily any available evidence on what works. In this way, a program that has produced no discernable evidence of effectiveness in numerous evaluations should not be considered for implementation. Unfortunately, this happens all the time. Consider the short-lived revival of the U.S.-based prison deterrence program known as Scared Straight, for which past evaluations showed that it failed to deter juvenile delinquents from future criminal activity (Petrosino et al., 2003). Consider, also, the long-standing school-based substance abuse prevention program known as DARE (Drug Abuse Resistance Education), for which the accumulated evidence demonstrates that it has only a trivial effect on substance use and crime (Gottfredson et al., 2002a; U.S. General Accountability Office, 2003). Many other examples exist in the United States and elsewhere.

Several considerations are involved in the selection and implementation of new crime prevention programs (as well as the expansion of effective programs or dismissal of ineffective or harmful ones). For example, the government may have different priorities, such as military defence spending, environmental protection, or health care, which are competing for scarce public resources. Further, national polls may show that the public is concerned with policy issues other than crime prevention and politicians' fear of being perceived as soft on crime if they are supportive of non-criminal justice crime prevention efforts (see Gest, 2001). Additionally, politicians' short time horizons (Tonry and Farrington, 1995b), make programs that show only long term results less appealing. Regrettably, evidence of what works best seems to rarely be a factor in implementing new crime prevention programs because policy and political considerations often dominate.

Evidence-based crime prevention ensures that the best available evidence is considered in the decision to implement a program designed to prevent crime. As noted by Petrosino (2000, p. 635), "an evidence-based approach requires that the results of rigorous evaluation be rationally integrated into decisions about interventions by policy-makers and practitioners alike."

This is an approach that has garnered much support in medicine (Halladay and Bero, 2000; Millenson, 1997). But even in medicine, a discipline noted for its adherence to scientific principles and high educational requirements, most practice is "shaped by local custom, opinions, theories, and subjective impressions" (Sherman, 1998, p. 6). Of course, making available scientific evidence on what works best to policy-makers and practitioners (regardless of the discipline) and having them put it into practice are two entirely different things.

EVIDENCE-BASED CRIME PREVENTION:
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Support for evidence-based crime prevention is growing (Welsh and Farrington, 2001; 2005), and this growth has been fostered by a number of recent developments, including:

- A movement toward an evidence-based approach in other disciplines, such as medicine (Millenson, 1997) and education (Mosteller and Boruch, 2002);
- Large-scale, government – and foundation – sponsored reviews of “what works” in crime prevention (Goldblatt and Lewis, 1998; Sherman et al., 1997; 2002; Tonry and Farrington, 1995a); and, most recently,
- The establishment of the Campbell Collaboration and its Crime and Justice Group (Farrington and Petrosino, 2000, 2001; Farrington et al., 2001).

In light of these advancements, this report aims to review the current state of evidence-based crime prevention and explore implications for Canada’s crime prevention efforts. To complete this task a number of key questions are addressed:

- a) What is the scientific foundation of the evidence-based model? How is the evidence-based model applicable to crime prevention?
- b) Is there an institutional foundation for evidence-based crime prevention? What are some of the key developments in evidence-based crime prevention in selected Western countries?
- c) What is the state of science on what works to prevent crime?
- d) What are the main challenges of evidence-based crime prevention?
- e) What are some of the key implications of other countries’ evidence-based crime prevention for Canada, specifically for its National Crime Prevention Strategy and National Crime Prevention Centre?

In this report, crime is defined as criminal acts that are of a personal or household nature. These include such crimes as murder, sexual assault, assault, robbery, burglary, theft of and from vehicles, theft from the person, and vandalism. The excluded acts are: traffic, organized, and transnational crimes.

As well, crime prevention is defined as any measure that reduces delinquency, property crime, or violent crime by successfully tackling the scientifically identified causal factors. The focus of this report is on alternative or non-criminal justice responses to crime.

THE EVIDENCE-BASED MODEL AND CRIME PREVENTION

In characterizing the evidence-based model and its application to crime prevention, it is important to first define what is meant by the term “evidence”. Throughout this report, evidence is taken to mean scientific, not criminal evidence. Evidence introduced in criminal court proceedings, while bound by laws and procedures, is altogether different from scientific evidence. The latter “refers to its common usage in science to distinguish data from theory, where evidence is defined as ‘facts ... in support of a conclusion, statement or belief’” (Shorter Oxford English Dictionary, 2002, as cited in Sherman, 2003a, p. 7).

While it is acknowledged that evidence-based crime prevention can serve other useful purposes – for example, in the case of policing, improving police training standards or improving community relations – the main outcome of interest is to improve crime prevention practice. The parallel is with evidence-based medicine’s primary focus on saving lives or improving the quality of life of those suffering from terminal or chronic illnesses. For evidence-based crime prevention, the prevention of crime is a primary outcome, and this is the focus throughout this report.

At the heart of the evidence-based model is the notion that “we are all entitled to our own opinions, but not to our own facts” (Sherman, 1998, p. 4). Within the evidence-based paradigm, drawing conclusions based on facts calls attention to two fundamental issues:

- a) the validity of the evidence and
- b) the methods used to locate, appraise, and synthesize the evidence.

Evaluation Research

When can we have confidence that the reported conclusions of an evaluated crime prevention program – whether they suggest that it is effective, ineffective, or, worse yet, harmful – are valid? This is a central question for an evidence-based approach to preventing crime.

High Quality Evaluations

It is surely stating the obvious to say that not all evaluations of crime prevention programs are equally valid. The methodological quality of evaluations can indeed vary greatly. According to Cook and Campbell (1979) and Shadish et al. (2002), methodological quality depends on four criteria:

- Statistical conclusion validity;
- Internal validity;
- Construct validity;
- External validity.

Descriptive validity refers to proper information reporting and could be added as a fifth criterion of the methodological quality of evaluation research (Farrington, 2003b; see also Lösel and Kofler, 1989). In particular, “validity refers to the correctness of inferences about cause and effect.” (Shadish et al., 2002, p. 34).

Statistical Conclusion Validity

Statistical conclusion validity is concerned with whether the presumed cause (the intervention) and the presumed effect (the outcome) are related. The main threats to this form of validity are insufficient statistical power – the probability of correctly rejecting the null hypothesis when it is false – to detect the effect (e.g., because of a small sample size) and the use of inappropriate statistical techniques.

Internal Validity

Internal validity refers to how well the study unambiguously demonstrates that an intervention (e.g., parent training) had an effect on an outcome (e.g., delinquency). Here, some kind of control condition is necessary to estimate what would have happened to the experimental units (e.g., people or areas) if the intervention had not been applied to them, which is termed the “counterfactual inference.”

The main threats to internal validity are:

- a) **Selection:** the effect reflects preexisting differences between experimental and control conditions.
- b) **History:** the effect is caused by some event occurring at the same time as the intervention.
- c) **Maturation:** the effect reflects a continuation of preexisting trends, for example, normal human development.
- d) **Instrumentation:** the effect is caused by a change in the method of measuring the outcome.
- e) **Testing:** the pretest measurement causes a change in the post-test measure.
- f) **Regression to the mean:** where an intervention is implemented on units with unusually high scores (e.g., areas with high crime rates), natural fluctuation will cause a decrease in these scores on the post-test, which may be mistakenly interpreted as an effect of the intervention. Alternatively, the opposite (an increase) happens when the interventions are applied to low-crime areas or low-scoring people.
- g) **Differential attrition:** the effect is caused by differential loss of units (e.g., people) from experimental compared to control conditions.
- h) **Chronological order:** it is unclear whether the intervention preceded the outcome (Shadish et al., 2002, p. 55).

Construct Validity

Construct validity refers to the adequacy of the operational definition and measurement of the theoretical constructs that underlie the intervention and the outcome. For example, if a program aims to investigate the effect of interpersonal skills training on offending, did the training program really target and change interpersonal skills, and were arrests a valid measure of offending? The main threats to this form of validity rest on the extent to which the intervention succeeded in changing what it was intended to change (e.g., how far there was treatment fidelity or implementation failure) and on the validity and reliability of outcome measures (e.g., how adequately police-recorded crime rates reflect true crime rates).

External Validity

External validity refers to how well the effect of an intervention on an outcome can be generalized or replicated in different conditions: different operational definitions of the intervention and various outcomes, different persons, different environments, and so on. It is difficult to investigate this within one evaluation study. External validity can be established more convincingly in systematic reviews and meta-analyses of a number of evaluation studies (see below). As noted by Shadish et al. (2002, p. 87), the main threats to this form of validity are the result of interactions of outcomes (effect sizes) with causal relationships (types of persons, settings, interventions). For example, an intervention designed to reduce offending may be effective with some types of people and in some types of places but not in others. A key issue is whether the effect size varies according to the degree to which those who carried out the research had some kind of stake in the results.

An evaluation of a crime prevention program is considered to be high quality if it possesses a high degree of internal, construct, and statistical conclusion validity. Put another way, one can have a great deal of confidence in the observed effects of an intervention if it has been evaluated with a design that controls for the major threats to these three forms of validity. Experimental (randomized and non-randomized) and quasi-experimental research designs are the types of evaluation designs that can best achieve this.

The Randomized Controlled Experiment

The randomized controlled experiment is considered the “gold standard” in evaluation research designs. It is the most convincing method of evaluating crime prevention programs (Farrington, 1983; Farrington and Welsh, 2005). This type of evaluation design involves the random allocation of subjects to treatment (the condition that receives the intervention) and control conditions. Through the process of random assignment, treatment and control groups are equated (prior to intervention) on all possible extraneous variables (e.g., age, gender, social class, school performance). Hence, any subsequent differences between the groups must be attributable to the intervention. Randomization is the only method of assignment that controls for unknown and unmeasured confounders as

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well as those that are known and measured. However, to be a high convincing evaluation method, the randomized experiment must be implemented with full integrity because implementation problems (e.g., maintaining random assignment, differential attrition, cross-over between control and experimental conditions) can reduce a randomized experiment's internal validity.

Another important feature of the randomized experiment is the need for a sufficiently large number of units (e.g., people or areas) to be randomly assigned to ensure that the treatment group is equivalent to the comparison group on all extraneous variables (within the limits of statistical fluctuation). As a rule of thumb, at least 50 units in each category are needed for this to occur (Farrington, 1997). This number is relatively easy to achieve with individuals, but very difficult to achieve with larger units such as communities, schools, or classrooms (as described below).

The Non-Randomized Experiment

An evaluation design in which experimental and control units are matched or statistically equated (e.g., using a prediction score) prior to intervention – which is called a non-randomized experiment – has less internal validity than a randomized experiment. It is important to note that statistical conclusion validity and construct validity may be just as high for a non-randomized experiment as for a randomized experiment.

The Quasi-Experimental Evaluation Design

In area-based studies, the best and most feasible design usually involves before and after measures in experimental and comparable control conditions, together with statistical control over extraneous variables. This is an example of a quasi-experimental evaluation design. Using this design, the effect of an intervention on crime can be investigated after controlling (e.g., in a regression equation) not only for prior crime but also for other factors that influence crime. Another possibility is to match two areas and then to choose one at random to be the experimental area. Of course, several pairs of areas would be better than only one pair. These methods are the most effective ways of dealing with threats to internal validity when the random assignment of units to experimental and control conditions cannot be achieved. Here again, statistical conclusion validity and construct validity may not be any different than in a randomized experiment.

Assessing Research Evidence

Just as it is crucial to use the highest quality of an evaluation design to investigate the effects of crime prevention programs; it is equally important that the most rigorous methods be used to assess the available research evidence. Efforts to assess if a particular crime prevention strategy (e.g., developmental, situational), intervention modality (e.g., parent training, improved street lighting), or some other feature of a crime prevention program is effective can take many forms. The most prominent types of review methodology include the single study, narrative, vote-count, systematic, and meta-analytic reviews.

Single Study Review Method

Not only is the single study method self-explanatory, its limitations – in comparison with the other methods – are blatantly evident. In this method, a single evaluation study, usually of high quality methodologically (e.g., a randomized controlled experiment), is used to represent a body of research on a particular type of intervention. For example, the well known Perry Preschool program (Schweinhart et al., 2005) has long been used by advocates of early childhood intervention to show the beneficial results this type of intervention can have on delinquency and later offending. Despite Perry’s beneficial results, and findings from cost-benefit analyses showing it returned to society savings far in excess of the costs (see Barnett, 1996; Greenwood et al., 2001), the program is by no means representative of other early childhood interventions with measured effects on criminal activity (see Farrington and Welsh, 2002b; 2003).

Narrative Review

Narrative reviews of the literature quite often include many studies and may be very comprehensive. Their main drawback, however, is researcher bias. Whether intentional or not, this bias typically starts with a less than rigorous methodology used to search for studies. More often than not, researchers will limit their search to published sources or even self-select studies to be included, based on their familiarity with them, quite possibly leaving many studies out of the review. This can sometimes lead to an incorrect interpretation of the particular intervention’s effect on crime. For example, what should have been presented as a desirable effect is instead reported as an uncertain effect (i.e., unclear evidence of an effect). On the positive side, narrative reviews usually provide a greater depth of information about the individual studies than would be found in the more rigorous vote count, systematic, or meta-analytic reviews.

Vote-Count Review

The vote-count method adds a quantitative element to the narrative review, by considering statistical significance (the probability of obtaining the observed effect if the null hypothesis of no relationship were true). In essence, this method calculates the “number of studies with statistically significant findings in favor of the hypothesis and the number contrary to the hypothesis” (Wilson, 2001, p. 73). The main problem with using statistical significance is that it depends partly on the size of the study’s sample and partly on the size of the study’s effect. For example, a significant result may reflect a small effect in a large sample or a large effect in a small sample.

A more comprehensive vote-count method was developed by Sherman and his colleagues (1997) to help them draw conclusions about:

- a) what works,
- b) what does not work,
- c) what is promising, and

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- d) what is unknown in preventing crime in seven major institutional settings: families, communities, schools, labor markets, places (e.g., urban centers, homes), police agencies, and courts and corrections.

In addition to statistical significance, their vote-count method integrated a “scientific methods scale” (SMS) that was largely based on the work of Cook and Campbell (1979). In constructing the SMS, the main aim was to devise a simple scale measuring internal validity that could easily be communicated to scholars, policy-makers, and practitioners. Thus, a simple five-point scale was used rather than a summation of scores (e.g., from 0-100) on a number of specific criteria. It was intended that each point on the scale should be understandable. The scale is as follows (see Welsh et al., 2002, pp. 18-19):

Level 1:

Correlation between a prevention program and a measure of crime at one point in time (e.g., areas with closed-circuit television (CCTV) have lower crime rates than areas without CCTV). This design fails to rule out many threats to internal validity and also fails to establish causal order.

Level 2:

Measures of crime before and after the program, with no comparable control condition (e.g., crime decreased after CCTV was installed in an area). This design establishes causal order but fails to rule out many threats to internal validity. Level 1 and level 2 designs were considered inadequate and uninterpretable by Cook and Campbell (1979).

Level 3:

Measures of crime before and after the program in experimental and comparable control conditions (e.g., crime decreased after CCTV was installed in an experimental area, but there was no decrease in crime in a comparable control area). This was considered to be the minimum design by Cook and Campbell (1979) and is also regarded as the minimum design that is adequate for drawing conclusions about what works in the book *Evidence-Based Crime Prevention* (Sherman et al., 2002). It rules out many threats to internal validity, including history, maturation/trends, instrumentation, testing effects, and differential attrition. The main problems with this level center on selection effects and regression to the mean (because of the non-equivalence of the experimental and control conditions).

Level 4:

Measures of crime before and after the program in multiple experimental and control units, controlling for other variables that influence crime (e.g., victimization of premises under CCTV surveillance decreased compared to victimization of control premises, after controlling for features of premises that influenced their victimization). This design has

greater statistical control over possible extraneous influences on the outcome and as a result, it deals with selection and regression threats more adequately.

Level 5:

Random assignment of program and control conditions to units (e.g., victimization of premises randomly assigned to have CCTV surveillance decreased compared to victimization of control premises).

As noted above, providing that a sufficiently large number of units are randomly assigned, those in the experimental condition will be equivalent (within the limits of statistical fluctuation) to those in the control condition on all possible extraneous variables that influence the outcome. Hence, this design deals with selection and regression problems and has the highest possible internal validity.

In light of the fact that the SMS as defined above focuses only on internal validity, all evaluation projects were also rated on statistical conclusion validity and on construct validity. Specifically, the following four aspects of each study were rated:

Statistical Conclusion Validity

- 1) Was the statistical analysis appropriate?
- 2) Did the study have low statistical power to detect effects because of small sample sizes?
- 3) Was there a low response rate or differential attrition?

Construct Validity

- 4) What was the reliability and validity of measurement of the outcome?

External Validity

External validity was addressed to some extent in the rules for accumulating evidence from different evaluation studies. The overall goal was again to ensure simplicity in communicating the findings.

The aim was to classify all program types into one of four categories:

- 1) what works,
- 2) what does not work,
- 3) what is promising, and
- 4) what is unknown

1. What Works

These are programs that prevent crime in the kinds of social contexts in which they have been evaluated. Programs coded as working must have at least two “level-3” to “level-5” evaluations showing statistically significant and desirable results and the preponderance of all available evidence showing effectiveness.

2. What Does Not Work

These are programs that fail to prevent crime. Programs coded as not working must have at least two “level-3” to “level-5” evaluations with statistical significance tests showing ineffectiveness and the preponderance of all available evidence supporting the same conclusion.

3. What Is Promising

These are programs where the level of certainty from available evidence is too low to support generalizable conclusions, but where there is some empirical basis for predicting that further research could support such conclusions. Programs are coded as promising if they were found to be effective in the significance tests in one “level-3” to “level-5” evaluation and in the preponderance of the remaining evidence.

4. What Is Unknown

Any program not classified in one of the three above categories is defined as having unknown effects.

The vote-count review method described above has great utility as part of meta-analytic and systematic reviews. However, one of the limitations of the vote-count review method is that equal weight is given to all studies irrespective of methodological quality. (For other limitations of the vote-count method, see Wilson, 2001, pp. 73-74).

Systematic Review

The systematic review and the meta-analytic review (described below) are the most rigorous methods for assessing the effectiveness of criminological interventions. Systematic reviews, according to Johnson et al. (2000, p. 35), “essentially take an epidemiological look at the methodology and results sections of a specific population of studies to reach a research-based consensus on a given study topic.” They use rigorous methods for locating, appraising, and synthesizing evidence from prior evaluation studies, and they report results with the level of detail that characterizes high quality research reports.

The key features of systematic reviews include the following:

- a) **Explicit objectives.** The rationale for conducting the review is made clear.
- b) **Explicit eligibility criteria.** The reviewers specify in detail why they included certain studies and rejected others by answering the following questions: What

- was the minimum level of methodological quality? (Here is where the SMS is sometimes employed). Did they consider only a particular type of evaluation design, such as randomized experiments? Did the studies have to include a certain type of participant, such as children or adults? What types of interventions were included? What kinds of outcome data had to be reported in the studies? All criteria or rules used in selecting eligible studies should be explicitly stated in the final report.
- c) **The search for studies is designed to reduce potential bias.** Due to the many ways in which bias can compromise the results of a review, the reviewers must explicitly state how they conducted their search of potential studies to reduce such bias. This includes answering the following questions: How did they try to locate studies reported outside scientific journals? How did they try to locate studies in foreign languages? All bibliographic databases that were searched should be made explicit so that potential gaps in coverage can be identified.
 - d) **Each study is screened according to eligibility criteria, with exclusions justified.** The searches will undoubtedly locate many citations and abstracts to potentially relevant studies. Each of the reports of these potentially relevant studies must be screened to determine if it meets the eligibility criteria for the review. A full listing of all excluded studies and the justifications for exclusion should be made available to readers.
 - e) **Assembly of the most complete data possible.** The systematic reviewer will generally try to obtain all relevant evaluations meeting the eligibility criteria. In addition, all data relevant to the objectives of the review should be carefully extracted from each eligible report and coded and computerized. Sometimes, original study documents lack important information. When possible, the systematic reviewer will attempt to obtain these data from the authors of the original report.
 - f) **Quantitative techniques are used when appropriate and possible.** A systematic review may or may not include a meta-analysis (described below). The use of a meta-analysis may not be appropriate due to a small number of studies, heterogeneity across studies, or different units of analysis of the studies (i.e., a mix of area- and individual-based studies). But when suitable, meta-analyses should be conducted as part of systematic reviews.
 - g) **Structured and detailed report.** The final report of a systematic review is structured and detailed so that the reader can understand each phase of the research, the decisions that were made, and the conclusions that were reached (Farrington et al., 2001, pp. 340-341).

As noted by Petrosino et al. (2001, p. 20), “The foremost advantage of systematic reviews is that when done well and with full integrity, they provide the most reliable and comprehensive statement about what works.” Systematic reviews are not, however, without their limitations; although these limitations or challenges appear to be more closely linked with administrative and dissemination issues, such as getting them in the hands of decision-makers (see Petrosino et al., 2001). Some of the challenges associated

with systematic reviews pertain to process transparency (e.g., the need to state the reasons why studies were included or excluded) and to inter-rater reliability (e.g., the need to reconcile different researchers' ways of coding study characteristics and outcomes).

Meta-Analytic Review

A meta-analysis involves the statistical or quantitative analysis of results from prior research studies (Lipsey and Wilson, 2001) and the statistical summary of data (in particular, effect sizes). Therefore, there must be a reasonable number of intervention studies that are sufficiently similar to be grouped together as there is little point in reporting an average effect size based on a very small number of studies. Nevertheless, quantitative methods can help the reviewer determine the average effect of a particular intervention.

One major product of a meta-analysis is a weighted average effect size, although there is usually also an attempt to investigate factors that predict larger or smaller effect sizes in different studies. Each effect size is weighted according to the sample size on which it is based, with larger studies having greater weights in calculating the average.

Strengths of the meta-analytic review method include:

- 1) its transparent nature – the explication of its methods and the studies involved – which simplifies replication by other researchers,
- 2) its ability to handle a larger number of studies than other review methods, and
- 3) the “statistical methods of meta-analysis help guard against interpreting the dispersion in results as meaningful when it can just as easily be explained as sampling error” (Wilson, 2001, p. 84).

Limitations of meta-analysis include, on a practical side, its time consuming nature and its inability to synthesize “complex patterns of effects found in individual studies” (Wilson, 2001, p. 84). A major problem has to do with selecting effect sizes for analysis in studies that measure many different outcomes.

THE STATE OF SCIENCE ON WHAT WORKS TO PREVENT CRIME

Research on “what works” in preventing crime has long been of interest to practitioners, policy-makers, and academics alike. A brief history of research to uncover proven practices to prevent crime often begins with Lipton et al.’s (1975) review of correctional treatment programs, which was upstaged (and misrepresented) by Martinson’s (1974) famous “nothing works” article. In the 1980s, numerous reviews were carried out to rebut Martinson, along with research into the effectiveness of alternative ways of preventing crime, such as community crime prevention (Rosenbaum, 1986). This trend continued into the 1990s, with some notable works including Clarke’s (1992a; 1997) *Situational Crime Prevention: Successful Case Studies*, Tonry and Farrington’s (1995a) *Building a Safer Society: Strategic Approaches to Crime Prevention*, Sherman et al. (1997) *Preventing Crime: What Works, What Doesn’t, What’s Promising*, and, more recently, the book that updated this report, *Evidence-Based Crime Prevention* (Sherman et al., 2002).

Only in recent years and in some of these more recent reviews, however, has there been an increased effort to improve the trustworthiness of claims about what works in preventing crime. This has come about through the use of the highest quality scientific evidence and the most rigorous and transparent review methods to assess what works. It has also come to form the state of science on what works best to prevent crime or what is termed ‘evidence-based crime prevention’, which is the focus of this section.

Following the lead of other reviews of evidence-based crime prevention (Sherman et al., 1997; 2002; Goldblatt and Lewis, 1998), this section is organized by the major institutional settings in which alternative or non-criminal justice crime prevention takes place: families, communities, schools, and places. The results presented here come from the two main sources of evidence-based research on crime prevention:

- 1) systematic reviews carried out under the auspices of the Campbell Collaboration Crime and Justice Group and
- 2) the book *Evidence-Based Crime Prevention*.

Family-Based Crime Prevention

Family-based crime prevention programs typically target family risk factors, such as poor child-rearing, poor supervision, and inconsistent or harsh discipline. When delivered by psychologists, these programs are often classified into parent management training, functional family therapy, or family preservation (Wasserman and Miller, 1998, pp. 199-201). Typically, they attempt to change social contingencies in the family environment so that children are rewarded in some way for appropriate or pro-social behaviors and punished in some way for inappropriate or antisocial behaviors. Family-based programs delivered by other health professionals (e.g., nurses) are typically less behavioral, mainly providing advice and guidance to parents or general parent education.

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Five types of family-based programs have been found to be effective in preventing crime:

- a) Home visitation;
- b) Day care/preschool;
- c) Parent training (with younger children);
- d) Home/community parent training (with older children);
- e) Multisystemic therapy (MST) (Farrington and Welsh, 2003).

Of these five types of family-based programs, parent training with younger children and MST are more effective in preventing delinquency or later criminal behavior. This can be seen in Table 1, which shows the results (i.e., mean effect sizes) of a meta-analysis of these five family-based crime prevention program categories. In the case of parent training, the mean effect size of .235 corresponds approximately to a significant 12% reduction in criminal activity (e.g., from 50% in the control group to 38% in the experimental group). MST’s mean effect size of .414 corresponds approximately to a significant 20% reduction in criminal activity (e.g., from 50% in the control group to 30% in the experimental group).

Table 1: Meta-Analysis Results of Family-Based Crime Prevention

Program Type	Low Confidence Interval (CI)	Mean Effective Size (ES)	High Confidence Interval (CI)	Proportion of significant ESs (p < .05)
Home Visitation	0.111	0.235	0.360	2/4
Day Care/Preschool.	0.147	0.259	0.371	4/5
Parent Training	0.274	0.395	0.517	5/10
Home/Community Parent Training	0.056	0.181	0.306	3/8
MST	0.281	0.414	0.548	2/6

Adapted from Farrington and Welsh (2003, p. 144, Table 4).

Home Visitation

One home visitation program that has shown particularly impressive results in reducing delinquency and improving other life course outcomes is the Elmira (New York) Prenatal/Early Intervention Project (PEIP) (Olds et al., 1998). The program randomly allocated 400 at-risk mothers either (a), to receive home visits from nurses during pregnancy, or (b) to receive visits both during pregnancy and during the first two years of life, or (c) to a control group who received no visits. Each visit lasted about one and one-

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quarter hours and the mothers were visited on average every two weeks. The home visitors gave advice about prenatal and postnatal care of the child, about infant development, and about the importance of proper nutrition and avoiding smoking and drinking during pregnancy.

The results of this experiment showed that the postnatal home visits caused a decrease in recorded child physical abuse and neglect during the first two years of life, especially by poor, unmarried teenage mothers; 4% of visited versus 19% of non-visited mothers of this type were guilty of child abuse or neglect. This last result is important, partly because children who are physically abused or neglected have an enhanced likelihood of becoming violent offenders later in life (Widom, 1989). In a 15-year follow-up, the main focus was on lower class, unmarried mothers. Among these mothers, those who received prenatal and postnatal home visits had fewer arrests than those who received prenatal visits or no visits (Olds et al., 1997). Also, children of these mothers who received prenatal and/or postnatal home visits had less than half as many arrests as children of mothers who received no visits (Olds et al., 1998).

Day Care/Preschool

The Perry Preschool project is one of the best known and most effective preschool programs in preventing delinquency and later criminal offending. Perry was essentially a Head Start program targeted on disadvantaged African American children, who were allocated (approximately at random) to experimental and control groups. The experimental children attended a daily preschool program, backed up by weekly home visits; the program lasted two years. The aim of this program was to provide intellectual stimulation, to increase thinking and reasoning abilities, and to increase later school development.

This program had long-term benefits. Berrueta-Clement et al. (1984) showed that, at age 19, the experimental group was more likely to be employed, more likely to have graduated from high school, more likely to have received college or vocational training, and less likely to have been arrested. By age 40, Schweinhart et al. (2005) found that it continued to make an important difference in the lives of the participants. Compared to the control group, program group members had significantly fewer lifetime arrests for violent crimes (32% versus 48%), property crimes (36% versus 58%), and drug crimes (14% versus 34%). Higher levels of schooling and higher annual incomes were also reported by the program group compared to the controls.

Like Perry, the Child-Parent Center (CPC) program in Chicago (Reynolds et al., 2001) provided disadvantaged children, aged three to four, with a high-quality, active learning preschool supplemented with family support. However, unlike Perry, CPC continued to provide the children with the educational enrichment component into elementary school, up to age 9. Just focusing on the effect of the preschool intervention, it was found that, compared to a control group, those who received the program were less likely to be arrested for non-violent offenses (17% versus 25%) and violent offenses (9% versus 15%) by the time they were 18. The CPC program also produced other benefits for those

in the experimental compared to the control group, such as a higher rate of high school completion.

Parent Training with Younger Children

Webster-Stratton and Hammond (1997) evaluated the effectiveness of parent training and child skills training with about 100 Seattle children (average age 5) referred to a clinic because of conduct problems. The children and their parents were randomly allocated to receive either

- a) parent training;
- b) child skills training;
- c) both parent and child training, or
- d) to a control group.

The skills training aimed to foster pro-social behavior and interpersonal skills using video modeling, while the parent training involved weekly meetings between parents and therapists for 22-24 weeks. Parent reports and home observations showed that children in all three experimental conditions had fewer behavioral problems than control children, both in an immediate and in a one-year follow-up. There was little difference between the three experimental conditions, although the combined parent and child training condition produced the most significant improvements in child behavior at the one-year follow-up.

Bernazzani and Tremblay (2001) carried out a systematic review of early parent training for families with children under age three years. Seven studies, all randomized controlled experiments, were included. The impact of the intervention was assessed using the outcome measures of child disruptive behavior (e.g., opposition to adults, truancy, and aggression) and delinquency (one study). The review found mixed results on the effectiveness of parent training in preventing child behavior problems under age three: four studies reported no evidence of effectiveness, two reported beneficial effects, and one reported mainly beneficial effects with some harmful effects. Control subjects typically received non-intensive, basic services. The one study that did measure delinquency showed beneficial effects on this outcome. The authors recommend caution in interpreting these results due to, for example, the limited number of high-quality studies and the modest effect sizes of the beneficial studies.

Home/Community Parent Training with Older Children

One of these programs, the multidimensional treatment foster care (MTFC) program (Chamberlain and Reid, 1998) revealed particularly strong evidence of effectiveness. Participants (young males with a history of serious and chronic offending, and their parents) in the MTFC program received individual therapy such as skill building in problem solving, and family therapy such as parent management training, while controls received what the authors refer to as group care (GC), which involved variations on group, individual, and family therapy. One year after the completion of the program,

MTFC members were less likely than GC members to have engaged in further criminal activity, as measured by police arrests.

Multisystemic Therapy

MST is a multiple component treatment program conducted in families, schools, and communities to address serious antisocial behavior in youths (Henggeler et al., 1998). The particular type of treatment is chosen according to the particular needs of the young person. Therefore, the nature of the treatment is different for each person. The treatment may include individual, family, peer, school, and community interventions, including parent training and skills training.

In Missouri, Borduin et al. (1995) randomly assigned 176 juvenile offenders either to MST or to individual therapy focusing on personal, family, and academic issues. Immediately after treatment, mother reported behavior problems decreased for the MST completers and increased for the individual therapy completers. Four years later, only 29% of the MST offenders (completers and non-completers) had been arrested, compared with 74% of the individual therapy group.

It is important to note that one large-scale independent evaluation of MST in Canada, by Leschied and Cunningham (2002), did not find that it was effective in reducing later convictions (compared with usual community services, which typically involved probation supervision). Members of the MST group were 10% more likely to be convicted.

Child Social Skills Training

Family-based efforts to prevent delinquency and later offending sometimes include a social skills training component for children. Lösel and Beelmann (2003) carried out a systematic review of the effects of child social skills or social competence training on antisocial behavior (including delinquency). The review included 55 randomized controlled experiments with 89 separate experimental-control group comparisons. A meta-analysis found that almost half of the comparisons produced positive results, ranging from small to large effect sizes, favoring the children who received the treatment compared to those who did not. Less than one out of ten revealed negative results (i.e., the control group fared better than the treatment group). Control subjects typically received non-intensive, basic services. At completion of the intervention, the smallest effect size was for delinquency (the mean effect sizes for all outcomes favored the treatment condition), but at later follow-up periods delinquency was the only outcome that was significantly affected. The meta-analysis also found that the most effective social skills training programs used a cognitive-behavioral approach and were implemented with older children (13 years and over) and higher risk groups who are already exhibiting some behavioral problems.

Community-Based Crime Prevention

Typically, community-based crime prevention is thought to be some combination of

- a) developmental prevention with its focus on reducing the development or influence of risk factors or “root causes” for delinquency and later offending (Tremblay and Craig, 1995);
- b) situational prevention, with its focus on reducing opportunities for crime (Clarke, 1995b).

However, there is little agreement in the academic literature on the definition of community prevention and the types of programs that fall within it (Bennett, 1996). Hope (1995, p. 21) defined community crime prevention as “actions intended to change the social conditions that are believed to sustain crime in residential communities.” Local social institutions (e.g., families, associations, churches, and youth clubs) are usually the medium by which these programs are delivered to address delinquency and crime problems (Hope, 1995, p. 21).

Recent reviews carried out to assess the effectiveness of community-based programs (Sherman, 1997; Welsh and Hoshi, 2002; Welsh, 2003; see also Hope, 1998) have concluded that this approach does not currently demonstrate evidence of effectiveness in preventing crime. While this is disappointing, it is nevertheless important from a policy perspective because it directs our attention towards other crime prevention programs that show evidence of effectiveness. Also, the conclusion of no proven effectiveness in preventing crime is not a claim that nothing works or that community-based efforts to prevent crime and delinquency should be abandoned. Three types of community-based programs are considered to be promising in preventing crime:

- a) Gang member intervention programs that are focused on reducing cohesion among youth gangs and individual gang members;
- b) Community-based mentoring;
- c) After-school recreation (Welsh and Hoshi, 2002; Welsh, 2003).

Gang Member Intervention

One of the most successful gang member intervention programs is the Boston Gun Project or Operation Ceasefire (Braga, et al., 2001). The program used a gang suppression strategy that was focused on firearms. According to Kennedy et al. (1996, p. 165), the goal of this multi-agency suppression approach “will not be to eliminate gangs as such, or to prevent all gang-related crime; it will be explicitly focused on violence and violence prevention.” The two main elements of the intervention were first, a direct law enforcement focus on illicit firearms traffickers who supply youth with guns and secondly, an attempt to generate a strong deterrent to gang violence (Braga et al., 2001, p. 199). The response to violence was to pull every “lever” available, including shutting down drug markets, serving warrants, enforcing probation restrictions, and making disorder arrests (Kennedy, 1997). The Ceasefire Working Group delivered its message

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clearly: “we’re ready, we’re watching, we’re waiting: who wants to be next?” (Kennedy, 1998). The Ceasefire strategy focused on all gang areas of the city and did not establish any comparison areas; therefore, analysis of impacts within Boston followed a basic before-after design. Additionally, a comparison was made with the trends in youth homicide in Boston and 39 major U.S. cities over the same time period.

The before-after evaluation showed a 69% reduction in the mean monthly number of youth homicide victims across Boston. The intervention was also associated with statistically significant decreases in the mean monthly number of city-wide gun assault incidents (Braga et al., 2001) and overall gang violence (Kennedy et al., 1996). In the comparison with other New England cities and large cities across the U.S., the significant reduction in youth homicides in Boston was attributed to Operation Ceasefire (Braga et al., 2001).

Community-Based Mentoring

This type of program involves nonprofessional volunteers spending time with young people at risk for delinquency, dropping out of school, school failure, and other social problems. Mentors behave in a “supportive, nonjudgmental manner while acting as role models” (Howell, 1995, p. 90).

One of the most successful community-based mentoring programs in preventing criminal activity is the Quantum Opportunities Program (QOP) (Hahn, 1999). QOP was implemented in five sites across the U.S. (one site later dropped out). At each site, 25 young people received the program, while another 25 young people served as the control group. The main goal of the program was to improve the life course opportunities of disadvantaged, at-risk youths during the high school years. The program ran for four years or up to grade 12, and was designed around the provision of three “quantum opportunities”:

- a) educational activities (peer tutoring, computer-based instruction, homework help);
- b) service activities (volunteering with community projects);
- c) development activities (curricula focused on life and family skills, and college and career planning).

Incentives in the form of cash and college scholarships were also offered to students for work carried out in these three areas. These incentives served to provide short-run motivation for school completion and future academic and social achievement. Mentors also received cash incentives and bonuses for keeping youths involved in the program.

An evaluation of the program six months after its completion found that the experimental group youths were less likely to be arrested compared to the control group (17% versus 58%). A number of other significant effects were observed. For example, compared to the control group, QOP group members were: more likely to have graduated from high school (63% versus 42%); more likely to be enrolled in some form of post-secondary

education (42% versus 16%); and less likely to have dropped out of high school (23% versus 50%) (Hahn, 1994).

After-School Recreation

This type of program is premised on the belief that providing pro-social opportunities for young people in the after-school hours can reduce their involvement in delinquent behavior in the community. After-school programs target a range of risk factors for delinquency, including alienation and association with delinquent peers. While recreation is just one form of after-school programs – other types include drop-in clubs, dance groups, and tutoring services – it plays an important role in young people’s lives, especially for a large number that do not have access to organized sport and other recreational opportunities.

One of the most successful after-school programs was carried out in Ottawa, Canada (Jones and Offord, 1989). Implemented in a public housing complex, this program recruited low-income children (ages 5 to 15) to participate in after-school activities aimed at improving skills in sports, music, dance, scouting, and other non-sport areas. Known as Participate and Learn Skills (PALS), the program aimed to advance children toward higher skill levels in the activities they chose and to integrate them into activities in the wider community. PALS was based on the belief that skill development in sports, music, dance, and so on, could affect other areas of young people’s lives, such as pro-social attitudes and behaviors, which in turn could help them avoid engaging in delinquent activities.

To evaluate the program, the housing project was matched with another public housing complex, which did not provide this specialized treatment. Children in the program housing site fared better than their control counterparts on a range of measures. The strongest program effect was found for juvenile delinquency. During the 32 months of the program, the monthly average of juveniles (in the age-eligible program range) charged by the police was 80% less (0.2 vs.1.0) at the experimental site compared to the control site. This statistically significant effect was diminished somewhat in the 16 months post-intervention: 0.5 juveniles were charged per month at the experimental site compared to 1.1 at the control site. Possibly, the effects of the program were wearing off. Substantial gains were observed in skill acquisition, as measured by the number of levels advanced in an activity, and in integration in the wider community among experimental site children compared with the controls. Spill-over effects on participating children included an increase in self-esteem, but no change in behavior at school or home was observed.

School-Based Crime Prevention

Schools are a critical social context for crime prevention efforts, from the early to later grades (Elliott et al., 1998). All schools work to produce vibrant and productive members of society. According to Gottfredson et al. (2002b, p. 149), “Students who are impulsive, are weakly attached to their schools, have little commitment to achieving educational goals, and whose moral beliefs in the validity of conventional rules for behavior are weak

are more likely to engage in crime than those who do not possess these characteristics.” The school’s role in influencing these risk factors and preventing crime in the wider community differs from measures taken to make the school a safer place. In this case, a school may adopt a greater security orientation and implement such measures as metal detectors, police in school, and closed-circuit television (CCTV) surveillance cameras.

Three types of school-based programs have been found to be effective in preventing crime:

- a) School and discipline management;
- b) Interventions to establish norms or expectations for behavior;
- c) Self-control or social competency instruction using cognitive-behavioral instruction methods (Gottfredson et al., 2002a).

The meta-analysis results also showed that school and discipline management programs were the most effective in preventing crime, with a mean effect size of .27. This corresponds approximately to a significant 14% reduction in criminal activity (e.g., from 50% in the control group to 36% in the experimental group). The mean effect size for self-control or social competency instruction using cognitive-behavioral instruction methods was .08, which corresponds approximately to a non-significant 4% reduction in criminal activity (e.g., from 50% in the control group to 46% in the experimental group). A mean effect size could not be computed for the other program type (Gottfredson et al., 2002a).

Each of these program types was also found to be effective in preventing alcohol or other drug use, antisocial behavior, and, in the case of self-control or social competency instruction, dropping out of high school and truancy (Gottfredson et al., 2002a).

School and Discipline Management

One example of a proven practice that used school and discipline management to improve the school environment and reduce school disorder and crime is Project PATHE (Positive Action Through Holistic Education) (Gottfredson, 1986). PATHE was implemented in four middle schools and three high schools in Charleston County, South Carolina. It focused on four elements: first, strengthening students’ commitment to school; secondly, providing successful school experiences; thirdly, encouraging attachment to the educational community; and finally, increasing participation in school activities. By increasing students’ sense of belonging and usefulness, the project sought to promote a positive school experience. A multi-site evaluation of the program found that the schools in which it was used, compared to control schools, experienced a significant 16% reduction in crime. The program also experienced a significant reduction in alcohol or other drug use (17%) and antisocial behavior (8%) (Gottfredson et al., 2002a, p. 75, Table 4.5).

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Interventions to Establish Norms or Expectations for Behavior

School-based programs to prevent crime involve clarifying to students (and sometimes to teachers and others) what is and what is not acceptable behavior in schools, and targeting related risk factors for crime. An important risk factor is school bullying, which has been shown to be associated with delinquency and later criminal offending (Farrington, 1993).

Several school-based programs have been effective in reducing bullying. The most well known was implemented in Norway (Olweus, 1994). It targeted teachers, parents and children to increase their awareness of bullying and to dispel myths about it. A 30-page booklet was distributed to all schools in Norway describing what was known about bullying and recommending what steps schools and teachers could take to reduce it. Also, a 25-minute video about bullying was made available to schools. Simultaneously, the schools distributed to all parents a four-page folder containing information and advice about bullying. In addition, anonymous self-report questionnaires about bullying were completed by all children.

The program was evaluated in Bergen. Each of the 42 participating schools received feedback information from the questionnaire, about the prevalence of bullies and victims, in a specially arranged school conference day. Also, teachers were encouraged to develop explicit rules about bullying (e.g., do not bully, tell someone when bullying happens, bullying will not be tolerated, try to help victims, try to include children who are being left out) and to discuss bullying in class, using the video and role-playing exercises. Also, teachers were encouraged to improve monitoring and supervision of children, especially in the playground. The program was successful in reducing the prevalence of bullying by one-half.

Self-Control or Social Competency Instruction Using Cognitive-Behavioral Instruction Methods

General instruction of students is the most common school-based crime prevention strategy. It involves a wide range of functions, including: “to teach [students] factual information, increase their awareness of social influences regarding misbehavior, expand their repertoires for recognizing and appropriately responding to risky or potentially harmful situations, increase their appreciation for diversity in society, improve their moral character” (Gottfredson et al., 2002a, p. 63, Box 4.3). Adding a cognitive-behavioral dimension (cues, feedback, rehearsal, or role-playing) to self-control or social competency instruction seems to be essential to program effectiveness.

One of the most successful of these school-based programs to have measured the effects on crime is the Montreal longitudinal-experimental study (Tremblay et al., 1996). The program combined child skills training and parent training. Tremblay and his colleagues (1996) identified disruptive (aggressive/hyperactive) boys at age 6 (from low socio-economic neighborhoods in Montreal) and randomly allocated over 300 of these to experimental or control conditions. Between ages 7 and 9, the experimental group received training designed to foster social skills and self-control. Coaching, peer

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modeling, role playing, and reinforcement contingencies were used in small group sessions on such topics as “how to help”, “what to do when you are angry”, and “how to react to teasing”. Also, their parents were trained using the parent management training techniques developed by Patterson (1982) at the Oregon Social Learning Center. By age 12, the experimental boys committed less burglary and theft, were less likely to get drunk, and were less likely to be involved in fights than the controls. Also, the experimental boys had higher school achievement. At every age from 10 to 15, the experimental boys had lower self-reported delinquency scores than the control boys. Interestingly, the differences in antisocial behavior between experimental and control boys increased as the follow-up progressed.

Place-Focused Crime Prevention

Place-focused crime prevention involves measures targeted at public or private locations (e.g., homes, stores, car parks, public transport facilities, street corners), as well as non-stationary places (e.g., buses and subways), which are known for high crime activity. The scientific basis of place-focused crime prevention comes from epidemiological studies showing that a small percentage of persons, places, times, and situations account for a disproportionately large share of serious crime. For example, it is estimated that across the United States 10% of the places are sites for around 60% of the crimes (Eck, 2002, p. 242).

Place-focused crime prevention is part of the larger strategy of situational crime prevention, which is defined as “... a preventive approach that relies, not upon improving society or its institutions, but simply upon reducing opportunities for crime” (Clarke, 1992b, p. 3). The origins of situational crime prevention are based in the larger body of opportunity theory, which sees the offender “as heavily influenced by environmental inducements and opportunities and as being highly adaptable to changes in the situation” (Clarke, 1995a, p. 57). Reducing the opportunities for crime is achieved essentially through some modification or manipulation of the environment. It can take the form of a number of different measures that involve increasing the effort or risks, reducing anticipated rewards, or inducing guilt or shame (Clarke and Homel, 1997).

Three types of place-focused programs have been found to be effective in preventing crime:

- a) Nuisance abatement;
- b) Closed-circuit television (CCTV) surveillance cameras;
- c) Improved street lighting (Eck, 2002; Farrington and Welsh, 2002a; Welsh and Farrington, 2004a, b).

Nuisance Abatement

This involves using civil law to curtail drug dealing and related crime problems in private residential premises. Eck’s (2002) review of the effects of this measure on drug dealing and related crimes turned up four programs evaluated with high quality designs, including

two randomized controlled studies. Each of the four programs showed evidence of reduced drug related crime.

In Oakland, California, Mazerolle et al. (1998) carried out a randomized experiment comparing the impact in controlling social disorder of civil remedies (police working with city agency representatives to inspect drug nuisance properties, coerce landlords to clean up blighted properties, post “no trespassing” signs, enforce civil law codes and municipal regulatory rules, and initiate court proceedings against property owners who failed to comply with civil law citations) versus traditional police tactics (surveillance, arrests and field interrogations). Observations of street blocks showed that conditions improved in the experimental places compared with the control places. In the most direct measure of offending, the mean number of males selling drugs on experimental blocks decreased from 3 before to 2 afterwards, while the mean number selling drugs on control blocks increased from 5 before to 22 afterwards.

Closed-Circuit Television (CCTV) Surveillance Cameras

Welsh and Farrington (2004a) carried out a systematic review of twenty-two studies – incorporating meta-analytic techniques – on the effects of CCTV on crime. The minimum evaluation design of the studies included in the review involved before-and-after measures of crime in experimental and comparable control areas (the same for improved street lighting). To date, no randomized experiments have been carried out with CCTV or improved street lighting. CCTV was found to have a significant effect, with an overall crime reduction of 21% in experimental areas compared with control areas. In the three main settings in which the CCTV evaluations were carried out (city center or public housing, public transport, and car parks), CCTV was most effective in reducing crime in car parks: crime decreased 44% in experimental areas compared to control areas. The success of the CCTV schemes in car parks was limited to a reduction in vehicle crimes (the only crime type measured) and all of the schemes (n=5) included other interventions, such as improved lighting or security officers. One possible explanation for the effectiveness of the CCTV-led schemes in car parks may be that it was part of a package of interventions focused on a specific crime type. Also, CCTV schemes were far more effective in reducing crime in the United Kingdom than in the U.S. (Welsh and Farrington, 2004b).

Improved Street Lighting

Farrington and Welsh (2002) carried out a separate systematic review – incorporating meta-analytic techniques – on the effects of improved street lighting on crime. Thirteen studies were included in the review. Improved street lighting was found to be effective in reducing crime in public space, with an overall crime reduction of 22% in experimental areas compared with control areas. In the three main settings in which street lighting evaluations were carried out (city center, residential or public housing, and car parks), street lighting was most effective in reducing crime in city centers: crime decreased 32% in experimental areas compared with control areas. In residential and public housing communities, crime decreased 18% in experimental areas compared with control areas.

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Similar to CCTV, improved street lighting was far more effective in reducing crime in the United Kingdom than in the U.S. Further analyses revealed that CCTV was most effective when combined with street lighting (as the secondary intervention), and when targeting vehicle crimes (Welsh and Farrington, 2004b).

INTERNATIONAL DEVELOPMENTS

In recent years, a number of important developments have fostered evidence-based crime prevention. For the most part, these developments have involved efforts to advance the science of evaluation research and review methodology. They have also involved assessments of the scientific evidence available on what works best, whether these were large-scale reviews or ones that were more narrowly focused on a particular crime prevention measure (e.g., does mentoring work?) or crime type (e.g., what works to reduce repeat residential burglary victimization?). Few efforts have been carried out to bridge research with policy or practice, whether this involved studying the utilization of results from evidence-based research, or using evidence-based research to bring about policy change. The latter may not be all that surprising considering that an evidence-based approach to the prevention of crime is still relatively new.

This section begins with a description of the role of the Campbell Collaboration Crime and Justice Group, which is at the forefront of the development of evidence-based crime prevention internationally. Following this is a brief overview of a number of leading countries' initiatives to advance evidence-based crime prevention.

Campbell Collaboration Crime and Justice Group

Named after the influential experimental psychologist Donald T. Campbell (Campbell, 1969), the Campbell Collaboration was set up for the purpose of preparing, maintaining, and disseminating evidence-based research on the effects of interventions in the social sciences, including education, social work and social welfare, and crime and justice. The Crime and Justice Group aims to prepare and maintain systematic reviews of criminological interventions and to make them accessible electronically to practitioners, policy-makers, scholars, the mass media, and the general public.

From Cochrane to Campbell

In 1993, the Cochrane Collaboration was established to prepare, maintain, and make accessible systematic reviews of research on the effects of health care and medical interventions. The Cochrane Collaboration established collaborative review groups (CRGs) to oversee the preparation and maintenance of systematic reviews in specific areas, such as heart disease, infectious diseases, and breast cancer. For example, the Cochrane Injuries Group prepares systematic reviews relevant to the prevention, treatment, and rehabilitation of traumatic injury. All reviews produced by Cochrane CRGs follow a uniform structure. The same level of detail and consistency of reporting is found in each group, and each review is made accessible through the Cochrane Library, a quarterly electronic publication.

The success of the Cochrane Collaboration in reviewing health care interventions stimulated international interest in establishing a similar infrastructure for conducting systematic reviews of research on the effects of social welfare, educational, and criminological interventions. Following several exploratory meetings, the Campbell

Collaboration was officially founded at a meeting at the University of Pennsylvania in Philadelphia in February 2000.

Following the example of the Cochrane Collaboration, the Campbell Collaboration aims to prepare rigorous and systematic reviews of high quality research evidence about what works. Recognizing that evidence is changing all the time, the Campbell Collaboration is committed to updating reviews on a periodic basis. Through international networking, it ensures that relevant evaluation studies conducted across the world are taken into account in its systematic reviews and that evidence from these reviews is made accessible globally through language translation and worldwide dissemination.

The Crime and Justice Group

At the Philadelphia meeting, the Campbell Collaboration appointed a Crime and Justice Steering Committee to coordinate the work of the Crime and Justice Group, hereafter referred to as the Group. The Group currently consists of 17 members from 13 countries, including Canada. Its broad mission is to oversee the preparation, maintenance, and dissemination of systematic reviews of the highest quality research on the effects of criminological interventions. Their reviews are focused on interventions designed to prevent delinquency or crime (presently the main focus of the Group), as well as those attempting to improve the management or operations of the criminal justice system.

The Group currently oversees systematic reviews on a wide range of topics, including child skills training, juvenile curfews, boot camps, policing crime “hot spots”, electronic monitoring, and community based alternatives versus custody. At the time this paper was written, 36 titles of systematic reviews had been registered with the Crime and Justice Group.

One problem that currently hinders the role of systematic reviews as an evidence-based resource in criminology and criminal justice is their tendency to be “one-off” exercises conducted as time, funding, and interest permit. Traditional print journals often lack the capacity for or interest in updating reviews once they have been published. As existing reviews become outdated, funding agencies usually pay for another set of researchers to start anew trying to locate, retrieve, code, and analyze many of the same studies. Typically, previous researchers do not share their raw or coded data with new researchers which impedes the development of cumulative knowledge. Although the results of new reviews may not be duplicative, the resources and effort that go into them most certainly are.

The Group plans to overcome this state of affairs by having systematic reviews updated every two or three years. These updates will take account of new studies, sound criticisms, and methodological advances. One of the Group’s strategies for maintaining systematic reviews over time is to stipulate that upon submitting a title to do a review, researchers must commit to periodically updating their review. In addition, because lack of funding is a major deterrent to updating reviews, the Group establishes links between funding agencies and researchers.

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Like Cochrane's CRGs, Campbell's Crime and Justice Group acts as a vehicle for bringing to the attention of practitioners, policy-makers, and others the most rigorous and up-to-date evidence on what works to prevent crime. At present, systematic reviews are disseminated or published in a wide range of outlets, such as government reports, academic journals, World Wide Web documents, and online publications. Each of these publication outlets has its own set of rules, structure, jargon and technical language, quality assurance methods, and capacity for detail and thoroughness. The electronic publication of the *Campbell Collaboration Reviews of Interventions and Policy Effects Database* (or C2-RIPE) intends to standardize the way systematic reviews are reported. Most importantly, systematic reviews will be more up-to-date and more easily accessible to those who need the evidence for their decision-making.

United States

The U.S. and international interest in an evidence-based approach to preventing crime began with the release of the now famous report *Preventing Crime: What Works, What Doesn't, What's Promising* (Sherman et al., 1997). The report was commissioned by the U.S. Congress as an independent, scientifically rigorous assessment of more than \$4 billion US worth of federally-sponsored crime prevention programs. Using a scientific methods scale to rate program evaluations combined with a vote-count method (as described above), evidence-based conclusions were drawn about the effects of the full range of crime prevention measures, from early childhood programs to correctional treatment. The New York Times called the report "the most comprehensive study ever of crime prevention" (Butterfield, 1997, p. A20).

Preceding the report by Sherman et al. (1997) was the federally-funded Communities That Care (CTC) program, developed by David Hawkins and Richard Catalano (1992), which is a crime prevention planning model for communities. The model incorporates research evidence on what works best to prevent crime tailored to the needs of individual communities. The CTC program is still in operation today in the U.S. (Harachi et al., 2003) and a replication in the U.K. is presently being evaluated. Blueprints for Violence Prevention is another important federally-funded initiative set up to help local jurisdictions use what works best to prevent violent crime and replicate these effective programs across the country. For programs to be labeled as effective, they must adhere to a set of strict scientific standards similar to those used by Sherman et al. (1997). To date, the program has identified 11 model crime prevention programs (proven effective) and 23 promising ones, some of which focus on adjudicated offenders (Mihalic and Irwin, 2003; Mihalic et al., 2004).

In more recent years, many other developments have further strengthened the role of evidence-based crime prevention in the U.S. One of these was the establishment of the Campbell Collaboration Crime and Justice Group in 2000, with its office based at the University of Pennsylvania's Department of Criminology and the Jerry Lee Center of Criminology in Philadelphia. (The headquarters of the Campbell Collaboration is also at the University of Pennsylvania). As noted above, this provides an institutional foundation for evidence-based crime prevention not only in the U.S. but internationally. Another key

institutional development was the creation of the Coalition for Evidence-Based Policy in Washington, DC, in 2001, with a mission to “promote government policymaking based on rigorous evidence of program effectiveness” (Coalition for Evidence-Based Policy, 2005). Furthermore, the influential writings by Lawrence Sherman (Sherman, 1998; 2003b; Sherman et al., 2002), David Farrington (Farrington, 2003b; Farrington and Welsh, 2001), and David Weisburd (Weisburd and Eck, 2004; Weisburd et al., 2003) in the context of American governance and crime policy have shaped the debate on evidence-based crime prevention’s theoretical underpinnings, research applications, and policy relevance. Some of these writings have been the product of Jerry Lee Crime Prevention Symposia, an annual conference that brings together leading criminologists from across the world and U.S. policy-makers.

It is important to recognize that the U.S., unlike any other country in the world, maintains a program of research to evaluate crime prevention programs, using the most rigorous evaluation designs. This is the backbone of evidence-based crime prevention. One new development – at the other end of the research spectrum – is a program to aid in the transfer of evidence-based principles and research to policy and practice (Crime and Justice Institute, 2004; Taxman et al., 2004). This is a major focus of this year’s National Institute of Justice conference on research and evaluation, entitled “Evidence-Based Policies and Practices.”

England and Wales

In recent years, there has also been an increased emphasis on evidence-based crime prevention in England and Wales. The British Government’s Crime Reduction Programme (CRP), which ran between 1999 and 2002 and cost £250 million (US \$388 million), was the central organizing body for evidence-led initiatives. The CRP grew out of a 1997 London conference and a subsequent report – modeled on the report by Sherman et al. (1997) – that assessed the research evidence on what is effective and cost-effective in preventing crime (Goldblatt and Lewis, 1998). Administered by the Home Office, the CRP’s main goal was to “reduce crime and disorder through an evidence-led strategy of what works ... with a special focus on promoting innovation, generating a significant improvement in knowledge about effectiveness and cost-effectiveness, and fostering progressive mainstreaming of emerging knowledge about good practice (Dhiri et al., 2001, pp. 179, 181).

Some of the initiatives under the CRP included:

1. The set up and (independent) evaluation of numerous programs designed to reduce repeat residential burglary, domestic violence and violence against women, and other priority crime problems;
2. The establishment of the University of York's Centre for Criminal Justice Economics and Psychology (a program dedicated to advancing economic evaluation research in the area of crime and justice);
3. The commission of research on the application of evidence-based principles (Tilley and Laycock, 2002);
4. The commission of systematic reviews on the effects of closed-circuit television (CCTV) surveillance cameras and improved street lighting on crime (Farrington and Welsh, 2002a; Welsh and Farrington, 2002);
5. Funding of the Campbell Collaboration Crime and Justice Group (for core development and specialized reviews);
6. The first randomized experiment in crime and justice in the country in 25 years (Farrington, 2003a) – a multi-site restorative justice program directed by Lawrence Sherman and Heather Strang (see Sherman, 2003c).

Despite these accomplishments, the CRP has been criticized for failing to deliver on its primary objective of using a “research-driven” approach to guide policy and practice on what works best to reduce crime (see e.g., Maguire, 2004). Nevertheless, since the end of the program, evidence-based crime prevention has maintained a role in British policy. There has been support for using what works to prevent crime based on research evidence, with calls for further efforts on this front (Hutchings et al., 2004). Additionally, the Home Office has commissioned new systematic reviews to investigate the efficacy of various crime prevention measures and has continued to provide funding for the Campbell Collaboration Crime and Justice Group. Another important development has been the support for high quality evaluations of crime prevention programs. According to Farrington (2003a, p. 163), “the Home Office seems more interested in using randomized experiments now than at any time in the past twenty-five years.”

Australia

Similarly, Australia's efforts to advance evidence-based crime prevention have been innovative and wide-ranging. Set up in 1997, the Australian Government's National Crime Prevention Programme (NCP), was not established with the expressed intent of adhering to the evidence-based model. However, it has seemingly embraced the notions of using evidence on what works best and contributing to the state of science on crime prevention through evaluations, albeit of varying methodological quality. An independent review of the NCP in 2004 concluded that it “had made measurable contributions to both the evidence base and the national crime prevention infrastructure, particularly at the local level” (Australian Government Attorneys General's Department, 2005).

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Other efforts include various government-sponsored publications such as *The Promise of Crime Prevention* (Gant and Grabosky, 2000) and *Pathways to Prevention* (National Crime Prevention, 1999), as well as the development, by the Australian Institute of Criminology (AIC) and the Attorney-General's Department of New South Wales, of an international conference on evidence-based crime prevention. Entitled "Delivering Crime Prevention: Making the Evidence Work" and scheduled to take place in November 2005, the conference aims to "critically examine the role of evidence-based policy approaches in the development and delivery of crime prevention policies and programs in Australia today" (Australian Institute of Criminology, 2005). Another effort deserving of mention is the in-kind assistance provided by the AIC to the Campbell Collaboration Crime and Justice Group.

In recent years, Australia has seen a trend toward the use of higher quality evaluation designs, including randomized controlled experiments, to assess the impact of crime prevention programs. Perhaps the best known of these evaluations are the randomized experiments of restorative justice conferences by Strang and Sherman (2005). Another important Australian randomized experiment is the Triple P (Positive Parenting Program) developed by Sanders et al. (2000), which has been delivered universally (e.g., a media-based parenting information campaign), on a selected basis to concerned parents, and in a primary care setting.

CHALLENGES

Evidence-based crime prevention is, of course, not without its challenges. Several substantive and practical challenges prevent the evidence-based model from reducing crime more effectively. One challenge is implementation and the ability to tailor evidence about what works best to local context and conditions. Another challenge is the acceptance of the evidence-based model by decision-makers, and a third is utilization of evidence-based research by practitioners.

Implementation

Implementation is central to the evidence-based model. “Evidence-based policing assumes that experiments alone are not enough. Putting research into practice requires just as much attention to implementation as it does to controlled evaluations” (Sherman, 1998, p. 7). Successful implementation calls for taking account of local context and conditions. Some critics (Lab, 2003), claim that in reaching conclusions about what works, the evidence-based paradigm fails to adequately account for local context and conditions, and may ascribe undue weight to any effects of the intervention on the outcome of interest. However, evidence-based crime prevention can take account of local context and conditions. For example, those investigating the evidence on the effectiveness of practices to deal with a particular crime problem can question the original researchers, or solicit unpublished reports to learn about how local context and conditions may have influenced the results. This information can then be integrated into the program’s existing profile.

As shown in research on knowledge diffusion and replication studies (see Ekblom, 2002; Liddle et al., 2002), it is possible to appropriately tailor proven crime prevention strategies or practices to their local setting. Not paying attention to this and using the “one-size-fits-all” approach, can severely impact the intervention’s implementation and overall effectiveness. Hough and Tilley (1998, p. 28) make clear this point:

Routinely-used techniques often cannot be taken off the shelf and applied mechanically with much real prospect of success. Standard, broad-brush, blockbuster approaches to problems tend to produce disappointing results. Where new approaches are adopted it is likely that adjustments will be needed in the light of early experience. All crime prevention measures work (or fail to do so) according to their appropriateness to the particular problem and its setting.

The proven practice can be matched with detailed information on the crime problem being targeted and on the setting (e.g., urban density, unemployment rates), and can then be modified as needed.

Decision-Maker Acceptance

Having convincing research evidence and having it influence policy and practice are two very different matters. Many misconceived political and policy barriers need to be overcome to move evidence-based crime prevention from mere rhetoric to reality. It seems that evidence of what works best is rarely a factor in implementing new crime prevention programs. Instead, political and policy considerations often dominate.

According to Weiss (1998), getting decision-makers to accept research evidence may be easier under any one of the following four scenarios:

1. “If the implications of the findings are relatively non-controversial, neither provoking rifts in the organization nor running into conflicting interests.
2. If the changes that are implied are within the program’s existing repertoire and are relatively small-scale.
3. If the environment of the program is relatively stable.
4. When the program is in a crisis or paralysis, and nobody knows what to do.” Here the decision-maker “may turn to evaluation.” (pp 24-25)

Practitioner Utilization

Barriers such as administrative constraints (e.g., too few resources, need for personnel training), philosophical differences, and institutional resistance to change will always interfere with getting some practitioners to use research evidence on what works best to prevent crime. Overcoming the “disconnect” between research evidence and practice may best be achieved through the employ of a research scientist/manager. As a research scientist, this individual would be responsible for keeping up-to-date information on the latest research findings, and coming up with recommendations based on the accumulated research evidence. As a manager, this individual’s role would be to monitor crime prevention in the field and ensure practices adhere to recommendations based on research evidence. Importantly, their role would also be to “redirect practice through compliance rather than punishment” (Sherman, 1998, p. 3).

The wider crime prevention community could learn from similar initiatives that have shown promise in the fields of medicine and agriculture. Some hospitals in the U.S. employ a medical researcher in charge of developing evidence-based guidelines for surgical procedures and patient care based on the most up-to-date scientific evidence (Millenson, 1997). In the field of agriculture in the U.S., the development of land-grant universities by the federal government brought science to local farmers to improve crop production. Land-grant universities, which exist throughout the country, “focused on practical problem solving and gave farmers access to scientific knowledge” (MacKenzie, 1998, p. 1). While somewhat different today, schools of agriculture in these universities still uphold the mission of aiding the farming community by making available scientific evidence on what works best.

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It is important to acknowledge that most other, not-for-profit organizations involved in crime prevention do not have the resources to retain the in-house services of a research scientist/manager. But like-minded organizations may be able to pool their resources to have an individual serve in this capacity.

IMPLICATIONS FOR CANADA

This section explores implications of other countries' evidence-based crime prevention for Canada, with specific reference to the National Crime Prevention Strategy (NCPS) and National Crime Prevention Centre (NCPC).

Support for International Organizations to Learn About and Contribute to What Works

The NCPS and NCPC have long recognized the importance of having “access to experience and research from around the world” (Government of Canada, 2003, p. 2) to aid in the development of more effective and cost-beneficial crime prevention measures for Canadian communities. This has included providing funding for the International Centre for the Prevention of Crime and the Campbell Collaboration Crime and Justice Group. With the Crime and Justice Group at the international forefront of the development of evidence-based crime prevention, this support has contributed to fostering new systematic reviews that may be relevant to Canada. While Campbell systematic reviews draw upon evaluation research from countries across the world, findings about what works, for whom and under what conditions, can be helpful to Canadian communities so long as they are tailored to the local context and conditions. Systematic reviews may also equip policy-makers and practitioners with insights on program content, training needs, and delivery. To enable the use of research evidence from comparable countries, systematic reviews can also report their findings according to the country of origin of the evaluation studies included in the review.

The NCPC should also commission new systematic reviews on the types of crime prevention measures that are specific to the Canadian situation. This could contribute to NCPC's strategic external priority to “develop knowledge in focus areas” (Government of Canada, 2003, p. 5). The focus of these reviews could be on the effectiveness of a specific type of intervention or on the most effective way to deal with a specific crime problem. As Campbell reviews, they will contribute to the larger body of knowledge on what works to prevent crime, while addressing the special needs of Canadian practitioners and policy-makers.

A Canadian Program of High Quality Evaluation Research

There is no strong tradition of high quality research to evaluate the impacts of crime prevention programs in Canada. Two randomized experiments, the Montreal Longitudinal-Experimental study by Richard Tremblay (1996) and the recent Ontario replication of multi-systemic therapy by Alan Leschied and Alison Cunningham (2002), are exceptions to what amounts to an absence of scientifically rigorous evaluation research (It is altogether another matter in Canadian corrections, where many rigorous evaluations have been carried out). A Canadian system of new crime prevention programs incorporating high quality evaluation designs is needed in order to create a foundation for evidence-based crime prevention now and in the long run.

These new crime prevention programs should be selected so as to contribute to scientific evidence presently deemed insufficient, such as in the area of promising practices, or as part of a program of replications to test effective practices with different populations and in different regions of the country. This may also contribute to the NCPC's strategic external priority to "develop knowledge in focus areas."

Not all evaluations of new crime prevention programs need be randomized experiments, but it may be instructive to consider Weisburd's (2003, p. 350) view on what should be required when randomized experiments are not to be used: "The burden here is on the researcher to explain why a less valid method should be the basis for coming to conclusions about treatment or practice."

Experiments and quasi-experiments should include large samples, long follow-up periods, and follow-up interviews (Farrington, 1999). Sample size is particularly important for both individual- and area-based studies. Long-term follow-ups are needed to assess how long effects persist after the intervention ends. This information may point to the need for booster sessions. Long follow-ups are a rarity in criminological interventions and should be a top priority of funding agencies. Research is also needed to identify the active ingredients of successful or promising crime prevention programs (Farrington, 2000). Many programs are multi-modal, making it difficult to isolate the independent effects of different components. Future experiments will be necessary to disentangle the effects of different elements of the most successful programs.

As part of the original research design, crime prevention programs should also include provision for an economic analysis – either a cost-benefit or cost-effectiveness analysis – to allow for an assessment of the economic efficiency of the program (Welsh and Farrington, 2000; Welsh et al., 2001). Already, the NCPC has developed a standard economic evaluation methodology and a manual for crime prevention program evaluators (Hornick et al., 2000). Background research on the cost-benefit of crime prevention programs with relevance to the Canadian situation has also been completed (National Crime Prevention Council, 1996a, b; 1997) and need to be built upon and integrated into the NCPS.

Funding Decisions to be Guided by Evidence on What Works Best

Government considerations such as scarce resources, competing national priorities, and public opinion will continue to impact on crime prevention funding decisions. However, scientific evidence about what works best needs to be central to this process. The present state of scientific evidence – from systematic reviews and other high quality review methods that may or may not include Canadian evaluations – is immediately accessible and is the most robust source to aid in decision-making about what types of crime prevention programs should be funded.

For example, NCPS priorities could be guided, over the short- to medium-term, by the available evidence on what works best in family-based and place-focused crime prevention. After a few years, this source of knowledge and evidence could be augmented

once a Canadian program of high quality evaluation research begins to produce results. Ultimately, this will lead to Canadian evidence about what works best to prevent crime becoming the primary source of information to aid in funding decisions.

As scientific research accumulates, crime prevention funding decisions may integrate other important criteria such as a program's ability to reduce crime within a specific time frame, short or medium-term, or to produce benefits such as improved educational achievement, less reliance on social services, improved health, and increased employment, in addition to reduced crime. Funding decisions should also be guided by research evidence about a program's ability to produce value for money.

A Canadian Research Program on Incorporating Evidence into Policy and Practice

As previously mentioned, having convincing research evidence and having it influence policy and practice are two very different matters. A program of research should be initiated in Canada to identify ways of incorporating into crime prevention policy and practice, scientific evidence on what works best. Already, some work on this front has begun in Canada, with a specific focus on the transference of principles of effective treatment into secure correctional settings (Bourgon and Armstrong, 2005).

Learning from the lessons of new U.S. research will be helpful, but it will be important to understand the specific needs of Canadian crime prevention practitioners and the relationships among the scientific community (and the research evidence they produce), policy-makers, and practitioners. What are the resource, service delivery, and training needs of practitioners with respect to an evidence-led approach? What systems do practitioners need for the adoption of new evidence, as it becomes available? Should accountability and performance measures be adopted to ensure that the latest scientific evidence is being utilized? These are just a few of the questions that must be addressed in the context of a Canadian program of research on incorporating scientific evidence into policy and practice.

REFERENCES

Australian Government Attorneys General's Department (2005). The National Crime Prevention Programme. Retrieved March 20, 2005, from www.crimeprevention.gov.au/agd/WWW/ncphome.nsf/Page/National_Crime_Prevention_Programme

Australian Institute of Criminology (2005). Delivering crime prevention: Making the evidence work. Retrieved March 20, 2005, from www.aic.gov.au/conferences/2005-cp/

Barnett, W. S. (1996). *Lives in the Balance: Age-27 Benefit-Cost Analysis of the High/Scope Perry Preschool Program*. Ypsilanti, MI: High/Scope Press.

Bennett, T. H. (1996). Community crime prevention in Britain. In T. Trenczek and H. Pfeiffer (Eds.), *Kommunale Kriminalprävention: Paradigmenwechsel und Wiederentdeckung alter Weisheiten* (pp. 169-183). Bonn, Germany: Forum Verlag Godesberg.

Bernazzani, O., Côté, C., and Tremblay, R. E. (2001). Early parent training to prevent disruptive behavior problems and delinquency in children. *Annals of the American Academy of Political and Social Science*, 578, 90-103.

Berrueta-Clement, J. R., Schweinhart, L. J., Barnett, W.S., Epstein, A. S., and Weikart, D. P. (1984). *Changed Lives: The Effects of the Perry Preschool Program on Youths Through Age 19*. Ypsilanti, MI: High/Scope Press.

Borduin, C. M., Mann, B. J., Cone, L. T., Henggeler, S. W., Fucci, B. R., Blaske, D. M., and Williams, R. A. (1995). Multisystemic treatment of serious juvenile offenders: Long-term prevention of criminality and violence. *Journal of Consulting and Clinical Psychology*, 63, 569-587.

Bourgon, G., and Armstrong, B. (2005). Transferring the principles of effective treatment into a "real world" prison setting. *Criminal Justice and Behavior*, 32, 3-25.

Braga, A. A., Kennedy, D. M., Waring, E. J., and Piehl, A. M. (2001). Problem-oriented policing, deterrence, and youth violence: An evaluation of Boston's Operation Ceasefire. *Journal of Research in Crime and Delinquency*, 38, 195-225.

Butterfield, F. (1997). Most efforts to stop crime fall short, study finds. *The New York Times*, April 16, A20.

Campbell, D. T. (1969). Reforms as experiments. *American Psychologist*, 24, 409-429.

Chamberlain, P., and Reid, J. B. (1998). Comparison of two community alternatives to incarceration for chronic juvenile offenders. *Journal of Consulting and Clinical Psychology*, 66, 624-633.

EVIDENCE-BASED CRIME PREVENTION:

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Clarke, R. V. (Ed.). (1992a) *Situational Crime Prevention: Successful Case Studies*. Albany, NY: Harrow and Heston.

Clarke, R. V. (1992b). Introduction. In R.V. Clarke (Ed.), *Situational Crime Prevention: Successful Case Studies* (pp. 3-36). Albany, NY: Harrow and Heston.

Clarke, R. V. (1995a). Opportunity-reducing crime prevention strategies and the role of motivation. In P.-O.H. Wikström, R.V. Clarke, and J. McCord (Eds.), *Integrating Crime Prevention Strategies: Propensity and Opportunity* (pp. 55-67). Stockholm, Sweden: National Council for Crime Prevention.

Clarke, R. V. (1995b). Situational crime prevention. In M. Tonry and D.P. Farrington (Eds.), *Building a Safer Society: Strategic Approaches to Crime Prevention. Crime and Justice: A Review of Research*, Vol. 19 (pp. 91-150). Chicago: University of Chicago Press.

Clarke, R. V. (Ed.). (1997). *Situational Crime Prevention: Successful Case Studies*. Second ed. Guilderland, NY: Harrow and Heston.

Clarke, R. V., and Homel, R. (1997). A revised classification of situational crime prevention techniques. In S.P. Lab (Ed.), *Crime Prevention at a Crossroads* (pp. 17-27). Cincinnati, OH: Anderson.

Coalition for Evidence-Based Policy (2005). The Coalition for Evidence-Based Policy. Retrieved on March 29, 2004, from www.excelgov.org/displaycontent.asp?keyword=prppcHomePage

Cook, T. D., and D. T. Campbell (1979). *Quasi-Experimentation: Design and Analysis Issues for Field Settings*. Chicago: Rand McNally.

Crime and Justice Institute (2004). *Implementing Evidence-Based Principles in Community Corrections: Leading Organizational Change and Development*. Washington, DC: National Institute of Corrections, Community Corrections Division, U.S. Department of Justice.

Dhiri, S., Goldblatt, P., Brand, S., and Price, R. (2001). Evaluation of the United Kingdom's 'Crime Reduction Programme: Analysis of costs and benefits. In B.C. Welsh, D.P. Farrington, and L.W. Sherman (Eds.), *Costs and Benefits of Preventing Crime* (pp. 179-201). Boulder, CO: Westview Press.

Eck, J. E. (2002). Preventing crime at places. In L.W. Sherman, D.P. Farrington, B.C. Welsh, and D.L. MacKenzie (Eds.) *Evidence-Based Crime Prevention* (pp. 241-294). New York: Routledge.

Eklblom, P. (2002). From the source to the mainstream is uphill: The challenge of transferring knowledge of crime prevention through replication, innovation and

EVIDENCE-BASED CRIME PREVENTION:

SCIENTIFIC BASIS, TRENDS, RESULTS AND IMPLICATIONS FOR CANADA

anticipation. In N. Tilley (Ed.), *Analysis for crime prevention. Crime prevention studies*, Vol. 13 (pp. 131-203). Monsey, NY: Criminal Justice Press.

Elliott, D. S., Hamburg, B., and Williams, K. R. (1998). Violence in American schools: An overview. In D.S. Elliott, B. Hamburg, and K.R. Williams (Eds.), *Violence in American Schools: A New Perspective* (pp. 3-28). New York: Cambridge University Press.

Farrington, D. P. (1983). Randomized experiments on crime and justice. In M. Tonry and N. Morris (Eds.), *Crime and Justice: An Annual Review of Research*, Vol. 4 (pp. 257-308). Chicago: University of Chicago Press.

Farrington, D. P. (1993). Understanding and preventing bullying. In M. Tonry and N. Morris (Eds.), *Crime and Justice: A Review of Research*, Vol. 17 (pp. 381-458). Chicago: University of Chicago Press.

Farrington, D. P. (1997). Evaluating a community crime prevention program. *Evaluation*, 3, 157-173.

Farrington, D. P. (1999). A criminological research agenda for the next millennium. *International Journal of Offender Therapy and Comparative Criminology*, 43, 154-167.

Farrington, D. P. (2000). Explaining and preventing crime: The globalization of knowledge. *Criminology*, 38, 1-24.

Farrington, D. P. (2003a). British randomized experiments on crime and justice. *Annals of the American Academy of Political and Social Science*, 589, 150-167.

Farrington, D. P. (2003b). Methodological quality standards for evaluation research. *Annals of the American Academy of Political and Social Science*, 587, 49-68.

Farrington, D. P., and Petrosino, A. (2000). Systematic reviews of criminological interventions: The Campbell Collaboration Crime and Justice Group. *International Annals of Criminology*, 38, 49-66.

Farrington, D. P., and Petrosino, A. (2001). The Campbell Collaboration Crime and Justice Group. *Annals of the American Academy of Political and Social Science*, 578, 35-49.

Farrington, D. P., Petrosino, A., and Welsh, B. C. (2001). Systematic reviews and cost-benefit analyses of correctional interventions. *Prison Journal*, 81, 339-359.

Farrington, D. P., and Welsh, B. C. (Eds.). (2001). What Works in Preventing crime? Systematic Reviews of Experimental and Quasi-Experimental Research. *Annals of the American Academy of Political and Social Science*, 578.

EVIDENCE-BASED CRIME PREVENTION:

SCIENTIFIC BASIS, TRENDS, RESULTS AND IMPLICATIONS FOR CANADA

Farrington, D. P., and Welsh, B. C. (2002a). *Effects of Improved Street Lighting on Crime: A Systematic Review*. Home Office Research Study 251. London: Home Office.

Farrington, D. P., and Welsh, B. C. (2002b). Family-based crime prevention. In L.W. Sherman, D.P. Farrington, B.C. Welsh, and D.L. MacKenzie (Eds.), *Evidence-Based Crime Prevention* (pp. 22-55). New York: Routledge.

Farrington, D. P., and Welsh, B. C. (2003). Family-based prevention of offending: A meta-analysis. *Australian and New Zealand Journal of Criminology*, 36, 127-151.

Farrington, D. P., and Welsh, B. C. (2005). Randomized experiments in criminology: What have we learned in the last two decades? *Journal of Experimental Criminology*, 1, 9-38.

Gant, F., and P. Grabosky (2000). *The Promise of Crime Prevention*. Second ed. Canberra: Australian Institute of Criminology.

Gest, T. (2001). *Crime and Politics: Big Government's Erratic Campaign for Law and Order*. New York: Oxford University Press.

Goldblatt, P., and Lewis, C. (Eds.). (1998). *Reducing Offending: An Assessment of Research Evidence on Ways of Dealing with Offending Behaviour*. Home Office Research Study, No. 187. London: Research and Statistics Directorate, Home Office.

Gottfredson, D. C. (1986). An empirical test of school-based environmental and individual interventions to reduce the risk of delinquent behavior. *Criminology*, 24, 705-731.

Gottfredson, D. C., Wilson, D. B., and Najaka, S. S. (2002a). School-based crime prevention. In L.W. Sherman, D.P. Farrington, B.C. Welsh, and D.L. MacKenzie (Eds.), *Evidence-Based Crime Prevention* (pp. 56-164). New York: Routledge.

Gottfredson, D. C., Wilson, D. B., and Najaka, S. S. (2002b). The schools. In J.Q. Wilson and J. Petersilia (Eds.), *Crime: Public Policies for Crime Control*. Second edition (pp. 149-189). Oakland, CA: Institute for Contemporary Studies Press.

Government of Canada (2003). *National Crime Prevention Centre Strategic Plan 2002/03—2005/06*. Ottawa: Author.

Greenwood, P. W., Karoly, L. A., Everingham, S. S., Houbé, J., Kilburn, M. R., Rydell, C. P., Sanders, M., and Chiesa, J. (2001). Estimating the costs and benefits of early childhood interventions: Nurse home visits and the Perry Preschool. In B.C. Welsh, D.P. Farrington, and L.W. Sherman (Eds.), *Costs and Benefits of Preventing Crime* (pp. 123-148). Boulder, CO: Westview Press.

Hahn, A. (1994). *Evaluation of the Quantum Opportunities Program (QOP): Did the Program Work?* Waltham, MA: Brandeis University.

EVIDENCE-BASED CRIME PREVENTION:

SCIENTIFIC BASIS, TRENDS, RESULTS AND IMPLICATIONS FOR CANADA

Hahn, A. (1999). Extending the time of learning. In D.J. Besharov (Ed.), *America's Disconnected Youth: toward a Preventive Strategy* (pp. 233-265). Washington, DC: Child Welfare League of America Press.

Halladay, M., and Bero, L. (2000). Implementing evidence-based practice in health care. *Public Money and Management*, 20, 43-50.

Harachi, T. W., Hawkins, J. D., Catalano, R. F., Lafazia, A. M., Smith, B. H., and Arthur, M. W. (2003). Evidence-based community decision making for prevention: Two case studies of Communities That Care. *Journal of Japanese Sociological Criminology*, 28, 26-38.

Hawkins, J. D., and Catalano, R. F. (1992). *Communities That Care: Action for Drug Abuse Prevention*. San Francisco, CA: Jossey-Bass.

Henggeler, S. W., Schoenwald, S. K., Borduin, C. M., Rowland, M. D., and Cunningham, P. B. (1998). *Multisystemic Treatment of Antisocial Behavior in Children and Adolescents*. New York: Guilford.

Hope, T. (1995). Community crime prevention. In M. Tonry and D.P. Farrington (Eds.), *Building a Safer Society: Strategic Approaches to Crime Prevention*. *Crime and Justice: A Review of Research*, Vol. 19 (pp. 21-89). Chicago: University of Chicago Press.

Hope, T. (1998). Community crime prevention. In P. Goldblatt and C. Lewis (Eds.), *Reducing Offending: An Assessment of Research Evidence on Ways of Dealing with Offending Behaviour* (pp. 51-62). Home Office Research Study, No. 187. London: Home Office.

Hornick, J. P., Paetsch, J. J., and Bertrand, L. D. (2000). *A Manual on Conducting Economic Analysis of Crime Prevention Programs*. Ottawa: National Crime Prevention Centre.

Hough, M., and Tilley, N. (1998). *Getting the Grease to the Squeak: Research Lessons for Crime Prevention*. Crime Detection and Prevention Series Paper 85. London: Home Office.

Howell, J. C. (Ed.). (1995). *Guide for Implementing the Comprehensive Strategy for Serious, Violent, and Chronic Juvenile Offenders*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.

Hutchings, J., Gardner, F., and Lane, E. (2004). Making evidence-based interventions work. In C. Sutton, D. Utting, and D.P. Farrington (Eds.), *Support from the Start: Working with Young Children and Their Families to Reduce the Risks of Crime and Anti-Social Behaviour* (pp. 69-79). Research Report 524. London: Department for Education and Skills.

EVIDENCE-BASED CRIME PREVENTION:

SCIENTIFIC BASIS, TRENDS, RESULTS AND IMPLICATIONS FOR CANADA

Johnson, B. R., De Li, S., Larson, D. B., and McCullough, M. (2000). A systematic review of the religiosity and delinquency literature: A research note. *Journal of Contemporary Criminal Justice*, 16, 32-52.

Jones, M. B., and Offord, D. R. (1989). Reduction of anti-social behaviour in poor children by nonschool skill development. *Journal of Child Psychology and Psychiatry*, 30, 737-750.

Kennedy, D. M. (1997). Pulling levers: Chronic offenders, high-crime settings, and a theory of prevention. *Valparaiso University Law Review*, 31, 449-484.

Kennedy, D. M. (1998). Pulling levers: Getting deterrence right. *National Institute of Justice Journal*, July, 2-8.

Kennedy, D. M., Piehl, A. M., and Braga, A. A. (1996). Youth violence in Boston: Gun markets, serious youth offenders, and a use-reduction strategy. *Law and Contemporary Problems*, 59, 147-196.

Lab, S. P. (2003). Let's put it in context. *Criminology & Public Policy*, 3, 39-44.

Leschied, A., and A. Cunningham (2002). *Seeking Effective Interventions for Serious Young Offenders: Interim Results of a Four-Year Randomized Study of Multisystemic Therapy in Ontario, Canada*. London: London Family Court Clinic.

Liddle, H. A., Rowe, C. L., Quille, T. J., Dakof, G. A., Mills, D. S., Sakran, E., and Biaggi, H. (2002). Transporting a research-based adolescent drug treatment into practice. *Journal of Substance Abuse Treatment*, 22, 231-243.

Lipsey, M. W., and Wilson, D. B. (2001). *Practical Meta-Analysis*. Thousand Oaks, CA: Sage.

Lipton, D., Martinson, R., and Wilks, J. (1975). *The Effectiveness of Correctional Treatment: A Survey of Treatment Evaluation Studies*. New York: Praeger.

Lösel, F., and Beelmann, A. (2003). Effects of child social skills training in preventing antisocial behavior: A systematic review of randomized evaluations. *Annals of the American Academy of Political and Social Science*, 587, 84-109.

Lösel, F., and Kofler, P. (1989). Evaluation research on correctional treatment in West Germany: A meta-analysis. In H. Wegener, F. Lösel, and J. Haisch (Eds.), *Criminal Behavior and the Justice System: Psychological Perspectives* (pp. 334-355). New York: Springer-Verlag.

MacKenzie, D. L. (1998). Using the U.S. land-grant university system to attack this nation's crime problem. *The Criminologist*, 23(2), 1, 3-4.

EVIDENCE-BASED CRIME PREVENTION:

SCIENTIFIC BASIS, TRENDS, RESULTS AND IMPLICATIONS FOR CANADA

Maguire, M. (2004). The Crime Reduction Programme in England and Wales: Reflections on the vision and the reality. *Criminal Justice*, 4, 213-237.

Martinson, R. (1974). What works? - Questions and answers about prison reform. *The Public Interest*, 35, 22-54.

Mazzerolle, L. G., Roehl, J., and Kadleck, C. (1998). Controlling social disorder using civil remedies: Results from a randomized field experiment in Oakland, California. In L.G. Mazzerolle and J. Roehl (Eds.), *Civil Remedies and Crime Prevention. Crime Prevention Studies*, Vol. 9 (pp. 141-159). Monsey, NY: Criminal Justice Press.

Mihalic, S. F., Fagan, A., Irwin, K., Ballard, D., and Elliott, D. S. (2004). *Blueprints for Violence Prevention*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.

Mihalic, S. F., and Irwin, K. (2003). Blueprints for Violence Prevention: From research to real-world settings – factors influencing the successful replication of model programs. *Youth Violence and Juvenile Justice*, 1, 307-329.

Millenson, M. L. (1997). *Demanding Medical Excellence: Doctors and Accountability in the Information Age*. Chicago: University of Chicago Press.

Mosteller, F., and Boruch, R. F. (Eds.). (2002). *Evidence Matters: Randomized Trials in Education Research*. Washington, DC: Brookings Institution Press.

National Crime Prevention. Commonwealth Attorney-General's Department. (1999). *Pathways to Prevention - Developmental and Early Intervention Approaches to Crime in Australia*. Canberra: Attorney-General's Department.

National Crime Prevention Council (1996a). *Money Well Spent: Investing in Preventing Crime*. Ottawa: Author.

National Crime Prevention Council (1996b). *Safety and Savings: Crime Prevention through Social Development*. Ottawa: Author.

National Crime Prevention Council (1997). *The Dollars and Sense of a Comprehensive Crime Prevention Strategy for Canada*. A report of a seminar on the effectiveness of crime prevention through social development, September 30 to October 1, 1996. Ottawa: Author.

Olds, D. L., Eckenrode, J., Henderson, C. R., Kitzman, H., Powers, J., Cole, R., Sidora, K., Morris, P., Pettitt, L. M., and Luckey, D. (1997). Long-term effects of home visitation on maternal life course and child abuse and neglect: Fifteen-year follow-up of a randomized trial. *Journal of the American Medical Association*, 278, 637-643.

EVIDENCE-BASED CRIME PREVENTION:

SCIENTIFIC BASIS, TRENDS, RESULTS AND IMPLICATIONS FOR CANADA

Olds, D. L., Henderson, C. R., Cole, R., Eckenrode, J., Kitzman, H., Luckey, D., Pettitt, L., Sidora, K., Morris, P., and Powers, J. (1998). Long-term effects of nurse home visitation on children's criminal and antisocial behavior: 15-year follow-up of a randomized controlled trial. *Journal of the American Medical Association*, 280, 1238-1244.

Olweus, D. (1994). Bullying at school: Basic facts and effects of a school based intervention programme. *Journal of Child Psychology and Psychiatry*, 35, 1171-1190.

Patterson, G. R. (1982). *Coercive Family Process*. Eugene, OR: Castalia.

Petrosino, A. (2000). How can we respond effectively to juvenile crime? *Pediatrics*, 105, 635-637.

Petrosino, A., Boruch, R. F., Soydan, H., Duggan, L., and Sanchez-Meca, J. (2001). Meeting the challenges of evidence-based Policy: The Campbell Collaboration. *Annals of the American Academy of Political and Social Science*, 578, 14-34.

Petrosino, A., Turpin-Petrosino, C., and Buehler, J. (2003). Scared Straight and other juvenile awareness programs for preventing juvenile delinquency: A systematic review of randomized experimental evidence. *Annals of the American Academy of Political and Social Science*, 589, 41-62.

Reynolds, A. J., Temple, J. A., Robertson, D. L., and Mann, E. A. (2001). Long-term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15-year follow-up of low-income children in public schools. *Journal of the American Medical Association*, 285, 2339-2346.

Rosenbaum, D. P. (Ed.). (1986). *Community Crime Prevention: Does It Work?* Beverly Hills, CA: Sage.

Sanders, M. R., Markie-Dadds, C., Tully, L. A., and Bor, W. (2000). The Triple P—Positive Parenting Program: A comparison of enhanced, standard, and self-directed behavioural family interventions for parents of children with early onset conduct problems. *Journal of Consulting and Clinical Psychology*, 68, 624-640.

Schweinhart, L. J., Montie, J., Zongping, X., Barnett, W. S., Belfield, C. R., and Nores, M. (2005). *Lifetime Effects: The High/Scope Perry Preschool Study Through Age 40*. Ypsilanti, MI: High/Scope Press.

Shadish, W. R., Cook, T. D., and Campbell, D. T. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Boston: Houghton Mifflin.

Sherman, L. W. (1997). Communities and crime prevention. In L.W. Sherman, D.C. Gottfredson, D.L. MacKenzie, J.E. Eck, P. Reuter, and S.D. Bushway, *Preventing Crime: What Works, What Doesn't, What's Promising* (chapter 3). Washington, DC: National Institute of Justice, U.S. Department of Justice.

EVIDENCE-BASED CRIME PREVENTION:

SCIENTIFIC BASIS, TRENDS, RESULTS AND IMPLICATIONS FOR CANADA

Sherman, L. W. (1998). *Evidence-Based Policing*. Washington, DC: Police Foundation.

Sherman, L. W. (2003a). Misleading evidence and evidence-led policy: Making social science more experimental. *Annals of the American Academy of Political and Social Science*, 589, 6-19.

Sherman, L. W. (Ed.). (2003b). Misleading Evidence and Evidence-Led Policy: Making Social Science More Experimental. *Annals of the American Academy of Political and Social Science*, 589.

Sherman, L. W. (2003c). Reason for emotion: Reinventing justice with theories, innovations, and research. *Criminology*, 41, 1-38.

Sherman, L. W., Farrington, D. P., Welsh, B. C., and MacKenzie, D. L. (Eds.). (2002). *Evidence-Based Crime Prevention*. New York: Routledge.

Sherman, L.W., Gottfredson, D.C., MacKenzie, D.L., Eck, J.E., Reuter, P., and Bushway, S.D. (1997). *Preventing Crime: What Works, What Doesn't, What's Promising*. Washington, DC: National Institute of Justice, U.S. Department of Justice.

Strang, H., and Sherman, L. W. (2005). Restorative justice to reduce victimization. In B.C. Welsh and D.P. Farrington (Eds.), *Preventing Crime: What Works for Children, Offenders, Victims, and Places*. Belmont, CA: Wadsworth, forthcoming.

Taxman, F. S., Shepardson, E. S., Delano, J., Mitchell, S., and Byrne, J. M. (2004). *Tools of the Trade: A Guide to Incorporating Science into Practice*. Washington, DC: National Institute of Corrections, U.S. Department of Justice.

Tilley, N., and Laycock, G. (2002). *Working Out What to Do: Evidence-Based Crime Reduction*. Crime Reduction Research Series Paper 11. London: Home Office.

Tonry, M., and Farrington, D. P. (Eds.). (1995a). Building a Safer Society: Strategic Approaches to Crime Prevention. *Crime and Justice: A Review of Research*, Vol. 19. Chicago: University of Chicago Press.

Tonry, M., and Farrington, D. P. (1995b). Strategic approaches to crime prevention. In M. Tonry and D.P. Farrington (Eds.). Building a Safer Society: Strategic Approaches to Crime Prevention. *Crime and Justice: A Review of Research*, Vol. 19 (pp. 1-20). Chicago: University of Chicago Press.

Tremblay, R. E., and Craig, W. M. (1995). Developmental crime prevention. In M. Tonry and D.P. Farrington (Eds.). Building a Safer Society: Strategic Approaches to Crime Prevention. *Crime and Justice: A Review of Research*, Vol. 19 (pp. 151-236). Chicago: University of Chicago Press.

EVIDENCE-BASED CRIME PREVENTION:

SCIENTIFIC BASIS, TRENDS, RESULTS AND IMPLICATIONS FOR CANADA

Tremblay, R. E., Masse, L. C., Pagani, L., and Vitaro, F. (1996). From childhood physical aggression to adolescent maladjustment: The Montreal prevention experiment. In R.D. Peters and R.J. McMahon (Eds.), *Preventing Childhood Disorders, Substance Use and Delinquency* (pp. 268-298). Thousand Oaks, CA: Sage.

U.S. General Accounting Office (2003). *Youth Illicit Drug Use Prevention: DARE Long-Term Evaluations and Federal Efforts to Identify Effective Programs*. Report GAO-03-172R. Washington, DC: Author.

Wasserman, G. A., and Miller, L. S. (1998). The prevention of serious and violent juvenile offending. In R. Loeber and D.P. Farrington (Eds.), *Serious and Violent Juvenile Offenders: Risk Factors and Successful Interventions* (pp. 197-247). Thousand Oaks, CA: Sage.

Webster-Stratton, C., and Hammond, M. (1997). Treating children with early-onset conduct problems: A comparison of child and parent training interventions. *Journal of Consulting and Clinical Psychology*, 65, 93-109.

Weisburd, D. (2003). Ethical practice and evaluation of interventions in crime and justice: The moral imperative for randomized trials. *Evaluation Review*, 27, 336-354.

Weisburd, D., and Eck, J. E. (2004). What can police do to reduce crime, disorder, and fear? *Annals of the American Academy of Political and Social Science*, 593, 42-65.

Weisburd, D., Petrosino, A., Lum, C. M. (Eds.). (2003). Assessing Systematic Evidence in Crime and Justice: Methodological Concerns and Empirical Outcomes. *Annals of the American Academy of Political and Social Science*, 587.

Weiss, C. H. (1998). Have we learned anything new about the use of evaluation? *American Journal of Evaluation*, 19, 21-33.

Welsh, B. C. (2003). Community-based approaches to preventing delinquency and crime: Promising results and future directions. *Japanese Journal of Sociological Criminology*, 28, 7-24.

Welsh, B. C., and Farrington, D. P. (2000). Monetary costs and benefits of crime prevention programs. In M. Tonry (Ed.), *Crime and Justice: A Review of Research*, Vol. 27 (pp. 305-361). Chicago: University of Chicago Press.

Welsh, B. C., and Farrington, D. P. (2001). Toward an evidence-based approach to preventing crime. *Annals of the American Academy of Political and Social Science*, 578, 158-173.

Welsh, B. C., and Farrington, D. P. (2002). *Crime Prevention Effects of Closed Circuit Television: A Systematic Review*. Home Office Research Study 252. London: Home Office.

EVIDENCE-BASED CRIME PREVENTION:

SCIENTIFIC BASIS, TRENDS, RESULTS AND IMPLICATIONS FOR CANADA

Welsh, B. C., and Farrington, D. P. (2004a). Evidence-based crime prevention: The effectiveness of CCTV. *Crime Prevention and Community Safety*, 6, 21-33.

Welsh, B. C., and Farrington, D. P. (2004b). Surveillance for crime prevention in public space: Results and policy choices in Britain and America. *Criminology & Public Policy*, 3, 497-526.

Welsh, B. C., and Farrington, D. P. (Eds.). (2005). *Preventing Crime: What Works for Children, Offenders, Victims, and Places*. Belmont, CA: Wadsworth, forthcoming.

Welsh, B. C., Farrington, D. P., and Sherman, L. W. (Eds.). (2001). *Costs and Benefits of Preventing Crime*. Boulder, CO: Westview Press.

Welsh, B. C., Farrington, D. P., Sherman, L. W., and MacKenzie, D. L. (2002). What do we know about crime prevention? *International Annals of Criminology*, 40, 11-31.

Welsh, B. C., and Hoshi, A. (2002). Communities and crime prevention. In L.W. Sherman, D.P. Farrington, B.C. Welsh, and D.L. MacKenzie (Eds.), *Evidence-Based Crime Prevention* (pp. 165-197). New York: Routledge.

Welsh, B. C., Farrington, D. P., Sherman, L. W., and MacKenzie, D. L. (2002). What do we know about crime prevention? *International Annals of Criminology* 40, 11-31.

Widom, C. S. (1989). The cycle of violence. *Science*, 244, 160-166.

Wilson, D. B. (2001). Meta-analytic methods for criminology. *Annals of the American Academy of Political and Social Science*, 578, 71-89.

