

Preventing future offending of delinquents and offenders: what have we learned from experiments and meta-analyses?

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Abstract

Objectives The main aim of this article is to review knowledge about what works in preventing future offending by delinquents and offenders. We examine what has been learned from randomized controlled trials (RCTs), systematic reviews, and meta-analyses in the past 10 years about the effectiveness of correctional interventions.

Methods We focus on important recent RCTs, systematic reviews, and meta-analyses from 2005 onwards. Where reported in the meta-analyses, we examine the number of RCTs included in the analyses and whether results from experiments differ from those contained in non-experimental designs.

Results Interventions based on surveillance, control, deterrence, or discipline are ineffective. Interventions based on restorative methods and skills training are effective. The effectiveness of interventions providing services and opportunities is unclear.

Conclusions More randomized trials are needed to evaluate the effectiveness of programs. Only evidence-based programs should be implemented.

Keywords Randomized controlled trial · Meta-analysis · Systematic review · Delinquency · Reoffending · Recidivism · Evidence-based corrections · Correctional interventions

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Introduction

Practitioners search for methods to reduce the number of people who commit criminal offenses. Recently, many who are responsible for developing and administering the programs to reduce offending have discussed the importance of evidence-based prevention and correctional programs. One successful method for providing evidence on the effectiveness of programs is the use of experimental research designs. Over the past 20 years, randomized controlled trials (RCTs) examining the effectiveness of efforts to reduce the future offending of youth, delinquents, and offenders have greatly increased, both in the number of experiments and the size of the samples in the experiments. This paper examines the results of significant, recent experiments, systematic reviews, and meta-analyses in order to draw conclusions about the types of programs that are effective in reducing future delinquent activity or criminal offending. We focus particularly on RCTs, systematic reviews, and meta-analyses that include RCTs and have been published in the past 10 years (from 2005 onwards).

Meta-analyses are examined in order to identify the number of randomized experiments identified in analyses of the effectiveness of the intervention and whether the results differed depending upon whether studies used an experimental or non-experimental design. Meta-analysts do intensive searches for all evaluations of the intervention being examined. Most analysts then investigate the impact of the research design in moderator analyses to identify whether the results of the stronger experimental designs differ from quasi-experimental designs. Thus, it is reasonable to use this information to examine what we have learned from experiments. It also provides us with some additional information about the number of experiments conducted in relation to the total number of evaluations of interventions. While the number of experiments examining specific interventions designed to reduce criminal activities is relatively small compared to other fields such as medicine, there are sufficient numbers of studies to enable us to draw conclusions about the effectiveness of programs in order to assist practitioners in making decisions about which programs to use.

We examine the results of comprehensive and intervention-specific meta-analyses as well as individual experimental studies to examine what has been learned in the past 10 years. The interventions studied were designed to reduce the offending of those who have already come to the attention of juvenile or adult correctional systems. The comprehensive meta-analyses provide information about general principles of effective interventions. The intervention-specific meta-analyses give information about the effectiveness of explicit interventions. We classified these interventions into six categories: (1) surveillance/control; (2) deterrent/punitive; (3) disciplinary; (4) rehabilitation and skill building; (5) services and opportunities; and (6) programs for juvenile delinquents. In addition to the two types of meta-analyses, we examine individual studies using experimental designs that were not otherwise included in the meta-analyses to further inform our discussion of what we have learned from experimental research in corrections.

Before beginning a review of what we have learned from experiments in corrections, it is important to recognize the influence of two factors. First, major changes have occurred in the philosophy and practice of corrections and these changes have influenced what interventions have been implemented and studied. The emphasis on rehabilitation in corrections that existed for the first six decades of the 20th century changed in the 1970s to a focus on surveillance, control, incapacitation, and deterrence.

As a result, many of the interventions studied in the past 45 years reflected this new focus. The second factor that influenced prevention and correctional interventions was the improvement of research methods, with experimental designs and new techniques enabling researchers to conduct studies that provide substantially more information about the effectiveness of interventions. This increase in research quality has led to an interest in evidence-based decision-making throughout the criminal justice system.

Changes in philosophy and its impact on evaluations

Dramatic events occurred in the U.S. approximately 45 years ago and these resulted in major social changes. It was a time of social transformation when people questioned the legitimacy of existing social institutions. Recognizing the inequities in society for minorities and women, a growing number of citizens began to argue for civil and women's rights. Youthful citizens questioned the mores of the times and demanded more freedom and choice in sexual activity, and hair and clothing styles. The unrest was further fueled by conflicts over the war in Vietnam. Anti-war advocates displayed disobedience through anti-war marches and draft dodging. The times were ripe for change and major transformations occurred in U.S. social institutions (Cullen and Gendreau 2000; Cullen and Gilbert 1982, 2013).

The field of corrections was not immune from the general social unrest but also faced additional challenges. For example, the experiences of inmates in prisons led to prison riots where both staff and inmates were injured or killed. Research on sentencing revealed extreme discretion and disparity in sentencing with negative consequences for many minorities.

Perhaps the seminal event for corrections was an essay by Martinson (1974) summarizing a then-unpublished report (subsequently published by Lipton et al. 1975) in which he and his colleagues examined correctional research with the goal of identifying what was effective in reducing the recidivism of offenders. At the time, this was a state-of-the-art review of existing literature. In his 1974 essay, Martinson presented the main conclusions of the report ("What Works": Questions and answers about prison reform) in which he provided a pessimistic assessment of the prospects of successfully rehabilitating delinquents and offenders (Martinson 1974). In his words, "With few and isolated exceptions the rehabilitative efforts that have been reported so far have had no appreciable effect on recidivism (p. 25)." This assessment created a "general despair about the potential of significantly affecting recidivism rates" (Blumstein 1997, p. 352). Subsequently, many accepted the mantra that "Nothing Works." Other reviews of the literature examining the results of research at approximately the same period of time as the Martinson essay also pointed toward the ineffectiveness of rehabilitation in reducing future recidivism (Bailey 1966; Sechrest et al. 1979). The "Nothing Works" doctrine soon became accepted as fact.

In actuality, the Lipton et al. (1975) report was much more cautious in its summary than Martinson was in his essay. In the opinion of the authors of the report, two problems existed in the research that made it impossible to draw definitive conclusions about the possibility that correctional programs could impact later recidivism. First, much of the research was of such poor quality that it was impossible to determine whether programs were effective in reducing recidivism. Second, the implementation

of the programs was often so inadequate that it could hardly be imagined that they would be effective. Despite the fact that it was often impossible to determine what worked, the mantra of “Nothing Works” was accepted as the truth.

While some researchers continued to point out that some correctional programs were effective (Cullen and Gilbert 1982, 2013; Palmer 1975, 1983), the time was ripe for a change, and substantial revisions occurred in correctional policy and practice. The philosophical emphasis on rehabilitation that had existed for the first six decades of the 20th century changed in the 1970s to a philosophy of incapacitation and deterrence. This philosophical change had a dramatic impact on correctional policy and practice in the United States. Discretion in sentencing was limited through sentencing guidelines and mandatory minimums. “Wars” on drugs and violence considerably increased the number of prison sentences and prison sentence lengths, thereby greatly swelling prison populations over time (Blumstein and Beck 1999). More retributive sentences, such as intensive supervision, longer prison terms, and boot camps, were initiated. Interventions such as urine testing and intensive supervision focused on controlling offenders rather than providing services or therapeutic treatment. From this philosophical perspective, if nothing worked to rehabilitate prisoners, then maybe it was better to keep them in prison so they could not commit crimes (incapacitate), give or threaten onerous punishments (deterrence) so people would not offend, or increase control or surveillance so they would not have an opportunity to reoffend.

Similar trends occurred in other countries. In the UK, an influential review of *The effectiveness of sentencing* (Brody 1976) was published by the Home Office in 1976. The tenor of the report can be judged in the following quotation:

Reviewers of research into the effectiveness of different sentences or ways of treating or training offenders have unanimously agreed that the results have so far offered little hope that a reliable and simple remedy for recidivism can be easily found. They have pointed out that studies that have produced positive results have been isolated, inconsistent in their evidence, and open to so much methodological criticism that they must remain unconvincing (Brody 1976, p. 37).

This report was followed by a reduction in rehabilitation programs in the UK.

The emphasis on incapacitation, deterrence, and control influenced programs offered to delinquents and offenders. Funding agencies provided resources for the development and evaluation of programs that were consistent with these philosophies. As a result, many evaluators studied the impact of these programs because they were newly developed and funding for research was available. Although some researchers continued to study rehabilitation programs, much of the research and evaluation focused on the deterrence, incapacitation, and control interventions that were popular at the time (Blumstein et al. 1978; Sechrest et al. 1979).

Growth in the number of experiments and the quality of research

While many accepted the mantra that “Nothing Works” to change offenders, others continued to try to understand the causes of crime, how to reduce recidivism of offenders, and what research techniques would enable us to successfully identify

effective programs and policies. For example, Farrington et al. (1986) argued that a careful examination of the Lipton et al. (1975) report clearly demonstrated that the way to address the problem of finding programs that were effective in preventing or reducing the criminal behavior of delinquents and offenders involved more rigorous research and better implemented programs. They argued for an increase in more rigorous research designs and the use of randomized trials.

Few experiments were conducted in criminology prior to 1981. Farrington (1983) conducted a search for all randomized experiments published between 1957 and 1981 that examined the impact of crime and justice interventions on offending outcomes. The experiments had to be published in English, conducted in real-life settings, and contain at least 50 persons in each condition. He found only 35 experiments fitting these criteria and these included interventions on prevention, juvenile diversion, community treatment including probation and parole, as well as interventions studying police, courts, and correctional treatment. He concluded the review by arguing in support of an increase in the quality of research used in criminology, and particularly emphasized the need for stronger methodological designs such as randomized experiments.

Since the time of Farrington's (1983) review, the number of randomized experiments conducted in criminology has greatly increased. Farrington and Welsh (2005) identified 83 randomized field experiments in criminology with offending outcomes and reasonably large numbers of participants (50 or more per condition) that were conducted between 1982 and 2004. The experiments had to include an outcome measure of offending; studies with outcomes of self-reported drug use, antisocial behavior or misconduct were excluded. The studies had to be in English and included books, journals and agency reports. They classified the experiments into five categories: Policing ($n=12$), prevention ($n=13$), corrections ($n=14$), court ($n=22$), and community ($n=22$). For the purposes of the present paper we would include the categories of experiments with juvenile delinquents, corrections, courts and community experiments because all of these were designed to reduce the offending of those who have already come to the attention of juvenile or adult courts or correctional systems. From this perspective, there were a fairly large number of experiments (62) conducted during this time period that focused on reducing reoffending.

While the number of experiments has increased over time, it represents only a small portion of the total number of research studies involving some type of comparison of a treated group with a control group (the minimum interpretable design). Thus, although criminological research has gone a long way toward improving research methods, we are still far below many other fields of research in the number of experimental studies conducted. This greatly reduces our certainty in drawing conclusions about the effectiveness of interventions. Quasi-experimental designs are used much more frequently than experimental designs and many of these studies use comparison groups that are not very similar to the treated group. This means that it is often impossible to rule out alternative explanations for the results (especially those focusing on pre-existing differences between groups).

In one project, MacKenzie (2006; see also 2002) searched thousands of studies and identified 284 reports that used experimental or quasi-experimental designs to examine the impact of correctional interventions. She classified each according to the quality of the research and the direction and significance of the results. The quality scores were based on the technique developed by University of Maryland researchers to assess the quality of various types of crime prevention evaluations (Sherman et al. 1997, 2002). This innovative technique for determining what works in crime prevention was

developed in response to a request by the U.S. Congress for a comprehensive evaluation of the effectiveness of efforts to prevent crime. The work culminated in a report "Preventing crime: What works, what doesn't, what's promising" (Sherman et al. 1997). Each study that was included in the report had to include a treated and non-treated comparison group, and each identified study was evaluated and scored on research quality or internal validity. Scores ranged from level 1, indicating the study was so poorly done that it could not be used to determine effectiveness, to 5, the highest level, considered the "gold standard." The Scientific Methods Scale was as follows (Sherman et al. 1997, 2002):

1. Correlation between an intervention and a measure of delinquency or crime.
2. Measures of crime before and after the program, with no control group, or a control group present without demonstrated comparability to the treatment group.
3. A comparison between two similar groups, one with and one without the intervention, or measures of crime before and after the program for treated and control groups.
4. Comparison between multiple groups with and without the program, controlling for other factors, or including pretest measures.
5. Random assignment and analysis of comparable intervention and control groups.

The 284 studies identified by MacKenzie were correctional interventions scoring at least 2 or higher on the Scientific Methods Scale. To be included in the analyses, the research had to compare a treated and comparison group and had to include an outcome measure of recidivism. The vast majority of the studies assessed did not even come up to level 2 on the Scientific Methods Score. Also disappointing was how few of the studies used an experimental design with random assignment of people to conditions. Of the 284 evaluations, only 42 (14.8 %) were scored 5 on the scale, the gold standard of research designs. In contrast, 66 (23.2 %) were scored 2. The latter were considered to be such poorly designed studies that the results could not be used to draw conclusions about what works. This research makes it obvious that, although there was a growth in the number of experiments in corrections, proportionately there were still few with high research quality.

Evidence-based corrections

Is the scientific evidence strong enough to conclude that an intervention changed offenders or delinquents? And did the intervention change the subsequent behavior in a socially desirable way? Answers to these questions provide evidence of what works in corrections. Correctional planning based on such information has become known as evidence-based corrections. This correctional philosophy promotes the idea that correctional interventions should be those shown in scientific studies to have the desired impact (MacKenzie 2000, 2001, 2005). While there are many possible desired outcomes of correctional interventions, reducing recidivism is one major impact referred to by the phrase evidence-based corrections, and this is the reason why many studies focus on this outcome.

In contrast to the “Nothing Works perspective,” evidence-based corrections makes the following assertions: Some correctional programs are effective in changing offenders; well-designed studies can demonstrate which programs are effective; and evidence-based programs should be the primary interventions that are developed and operated by correctional systems. Evidence-based corrections reject the “Nothing Works” philosophy and instead examine what works to change criminal and delinquent activities. It is assumed that science should be used to inform public policy decisions about which programs or interventions are effective and that these interventions should be used. In the UK, the Correctional Services Accreditation Panel was established in the 1990s to ensure that only effective evidence-based programs were implemented (see McGuire 2001).

As prison populations grow nationally and corrections makes up an increasing proportion of state and local budgets, decision makers and practitioners in many jurisdictions became interested in asking questions about whether the funds they spent were being effectively used. In particular, they asked whether the correctional interventions and programs in their jurisdictions had an impact on later criminal behavior. Interest, therefore, focused on whether there was scientific proof of the impact of specific programs on later criminal activity. Thus, policy-makers, practitioners, and researchers have come together in their interest in “evidence-based” corrections.

Using systematic reviews and meta-analyses to assess what works in corrections

Systematic reviews and meta-analyses, increasingly used in the medical and social sciences, are important new developments in the fields of statistics and research methodology. These techniques are used to quantitatively examine a group of studies to determine if they are effective in achieving an identified outcome or outcomes (Lipsey and Wilson 2001). Systematic reviews and meta-analysis overcome some of the problems inherent in literature reviews such as the one conducted by Martinson and colleagues, using vote-counting. Merely counting the number of significant or non-significant results, as Martinson did, is flawed because significance depends partly on effect size and partly on sample size. Furthermore such reviews cannot cope with the incredible increase in the number of research studies. Systematic reviews aim to eliminate the subjectivity of narrative reviews (see e.g., Farrington and Petrosino 2001). These are reviews that use rigorous methods for locating, appraising, and synthesizing evidence from prior evaluations (Farrington et al. 2011). Like literature reviews, systematic reviews are methods for drawing conclusions from a group of studies. In contrast, they are reported with the same precision characterized by high-quality reports or original research. They include explicit statements of objectives and eligibility criteria and the search for studies is designed to reduce potential bias. Systematic reviews may or may not include quantitative techniques, called meta-analysis, to analyze the results. The final report of a systematic review (with or without meta-analysis) is structured and detailed.

A meta-analysis involves the statistical or quantitative analysis of the results of prior research studies (Lipsey and Wilson 2001). Meta-analysis uses statistical methodology to estimate weighted mean effect sizes and thus eliminates the subjectivity of

interpretation characteristic of literature reviews. In meta-analysis quantitative data from a group of studies is used to obtain the best estimates of the magnitude of the effectiveness of interventions. Meta-analysis requires a sufficiently large number of studies that are sufficiently similar to be grouped together. Thus, not all systematic reviews include a meta-analysis.

Systematic reviews and meta-analyses examining correctional interventions can be classified into two general categories: comprehensive (also referred to as theoretical, see MacKenzie 2006) and intervention-specific (Lipsey 2009). Comprehensive analyses combine a large number of studies and are more inclusive in their eligibility criteria. The goal of these analyses is to examine whether there is support for various theoretical perspectives and to identify general principles of treatment and effectiveness.

The intervention-specific analyses focus more on programs, strategies, or interventions that are clearly defined such as drug courts, boot camps, or intensive supervision. The question addressed is whether these particular types of interventions reduce recidivism. Many of the analyses also examine whether the overall results hold up when only the studies using randomized designs are examined. Where available we examine meta-analyses that report on the number of RCTs included in the analysis.

Comprehensive meta-analyses and reviews of meta-analyses

In this section we examine what has been learned from comprehensive meta-analyses and reviews of meta-analyses regarding general principles of effective interventions. Several comprehensive meta-analyses have examined whether the rehabilitation principles proposed by a group of Canadian researchers distinguish between effective and ineffective programs. For example, Andrews and his colleagues completed a series of meta-analyses of studies classified as conforming to the principles of effective rehabilitation or not (Andrews et al. 1990a; Andrews and Dowden 2005; Gendreau et al. 2006; see also Andrews and Bonta (2005) for a discussion of these principles). The interventions that conformed to their proposed principles were consistently more effective than other approaches in reducing recidivism as measured by official records. Successful interventions were skill-oriented and used a behavioral or cognitive-behavioral theoretical model based on social learning principles and targeted dynamic criminogenic deficits in multi-modal programs. Dynamic criminogenic deficits were defined as deficiencies that are changeable and directly related to an individual's criminal activity. Lipsey (1992) in a meta-analysis of 397 studies of juvenile delinquency interventions, and Lösel (1995), in a review of meta-analyses, found results similar to the conclusions of Andrews and Gendreau and their colleagues. In general the research demonstrates that behavioral, skill-oriented, or multimodal programs are more effective than other types of programs.

In a later study, Andrews and Dowden (2005) conducted a meta-analysis using 273 evaluations of human service programs. They found that programs with integrity enhanced effectiveness consistent with the principles of risk, need, and responsivity. They defined treatment programs with integrity as those characterized by sound management, tight design with skilled practitioners and close monitoring of program delivery and clinical supervision.

In another recent study, Lipsey (2009) conducted a meta-analysis of 548 evaluations of programs for juveniles in order to examine what factors emerge as major correlates of program effectiveness. Instead of beginning with a set of theoretical principles, Lipsey used a more inductive approach that he describes as atheoretical and descriptive to examine juvenile interventions. He focused on identifying the correlates of recidivism effects, or the characteristics of study methods, programs, offenders, and intervention circumstances that were most strongly associated with a large desirable effect on recidivism.

Lipsey classified the types of intervention modalities into seven categories: surveillance, deterrence, discipline, restorative, counseling and its variants, skill building, and multiple coordinated services. He found that only three factors emerged as major correlates of program effectiveness. These were a “therapeutic” intervention philosophy as opposed to strategies focusing on control or coercion (surveillance, deterrence, or discipline), targeting high-risk offenders, and the quality of implementation. Programs categorized as skill-building, restorative, counseling or multi-component were effective in reducing recidivism while deterrence and discipline-focused programs were not. Few differences were found between the effectiveness of different types of therapeutic interventions. With other variables controlled, he found no difference in recidivism effects based on the amount of supervision that youth received. That is, there were no differences in the effects of interventions if they were delivered to offenders in the community, after diversion, on probation or parole, or incarcerated. Forty two percent of the evaluations were RCTs. Study methodology was used as a control in the analyses.

Meta-analyses comparing programs or interventions that have a therapeutic rehabilitation focus with those emphasizing increased control or deterrence have consistently found evidence that the rehabilitation-type programs are effective while those with a control or deterrence focus do not reduce future recidivism.

Lipsey and Cullen (2007) completed a review of meta-analyses comparing programs developed from the perspective of therapeutic rehabilitation with more punitive approaches focusing on increased control and deterrence. The rehabilitative programs were distinguished from the punitive approaches because the former programs were designed to motivate and guide offenders and delinquents and support constructive change in whatever characteristics or circumstances fostered their criminal activity (criminogenic characteristics). Sanctions and surveillance programs were defined as those based on deterrence-oriented correctional policies such as intensive supervision, electronic monitoring, boot camps, or community supervision. In general, in the meta-analyses reviewed, the sanctions and surveillance-focused programs did not have a desirable impact on recidivism and in some cases the sanctioned offenders and delinquents had higher recidivism. In contrast, the programs that emphasized rehabilitation did indeed lower recidivism. Lipsey and Cullen concluded that punitive approaches, as reflected in the crime control and law-and-order perspectives, fail to reduce recidivism.

Two of the meta-analyses reviewed by Lipsey and Cullen examined rehabilitative programs provided in residential facilities compared with programs provided in the community. In both environments, rehabilitation reduced recidivism, but treatment had a greater impact when it was delivered in the community. Nevertheless, rehabilitative programs can be effective when provided in institutions as well as in the community.

Overall the comprehensive systematic reviews and meta-analyses indicate that there are some general principles underlying effective rehabilitative programs, and that interventions incorporating these principles can successfully reduce recidivism. In contrast, the idea that creating more punitive programs based on deterrence and law and order perspectives will be an effective method for reducing later recidivism is not supported by the research results. Interventions that emphasize deterrence or control have not shown evidence of effectively reducing recidivism and some appear to actually increase later criminal activity. Neither putting people in prison instead of a community alternative nor giving them longer prison sentences appears to decrease recidivism.

Intervention-specific meta-analyses and experiments

The University of Maryland researchers who completed the “Preventing Crime” report for the U.S. Congress assessed the quality of research using the Scientific Methods Scale described previously and drew conclusions about the effectiveness of programs by examining the significance and the direction of the results for various criminal justice interventions, strategies and programs (Sherman et al. 1997). Subsequently, they became interested in the relatively new technique of meta-analysis. Unlike previous researchers who had completed meta-analyses at the time (Andrews et al. 1990b; Lipsey 1992, 1995), they did not include a large number of different programs and strategies in one large meta-analysis in order to examine general principles. The previous researchers had examined broad theoretical principles of rehabilitation and theory. In contrast the new work focused more on specific interventions to examine whether these were effective in producing the desired criminal justice outcomes. Meta-analyses and systematic reviews became valuable new tools to assist researchers in determining what works or does not work.

Some meta-analyses focus on particular types of programs such as drug courts (Mitchell et al. 2007, 2012a, b, c) or cognitive-behavioral therapy (Landenberger and Lipsey 2005). We classified these programs in the categories used by Lipsey in his 2009 meta-analysis, with the exception that we separated work programs from therapeutic programs. Many of the new reentry programs for adults provide opportunities for work, housing, or other services but do not necessarily have therapeutic components. Thus, we categorize interventions into six categories: Surveillance and control; deterrent and punitive; disciplinary; rehabilitative and skill building including cognitive skills, drug treatment, batterer intervention, sex offender treatment, education, and restorative; services and opportunities; and programs for juvenile delinquents. Table 1 shows the classification of recent significant RCTs and Table 2 shows the meta-analyses we use to draw conclusions about what has been learned from experiments in corrections in the past 10 years.

The increased emphasis on more rigorous evaluations and the improved quality of the evaluations conducted during the past 20 years have had several valuable outcomes. First, as is clear from a review of the research, some programs are effective in changing offenders and reducing their future criminal activities. Furthermore, the existing deterrent, disciplinary, and control (surveillance) interventions initiated under the law and order perspective have been evaluated with the more rigorous experimental

Table 1 Intervention-specific analyses showing RCTs, number of RCTs in meta-analyses (if available) and outcomes

Category of intervention	Reference	Intervention	Study design	Results
Surveillance/control	Barnes et al. 2010	Intensive supervision	RCT	No reduction in recidivism
	Killias et al. 2010	EM	RCT	EM marginally better than community supervision
Disciplinary	Mackenzie et al. 2007	Boot camp compared to traditional prison	RCT	Boot camp had lower recidivism
Restorative and skill building	Mills et al. 2013	Group-based mandated batterer intervention vs. a justice-based program (Circles of Peace)	RCT	Circles of Peace group recidivated less in 12-month follow-up but not at 24 months
Programs for delinquents	Sexton and Alexander 2000	Delinquents in Therapy (FFT) compared to probation as usual	RCT	FFT did no better in reducing felony recidivism except when therapists had high adherence to the model
	Sawyer and Borduin 2011	Multi-Systemic Therapy (MST) compared to individual therapy group	RCT	MST reduced rearrests
	Chamberlain et al. 2007	Girls in Treatment Foster Care (TFC) compared to girls in group care	RCT	Girls in TFC had fewer criminal referrals

RCT Randomized Controlled Trial

Table 2 Intervention-specific systematic reviews and meta-analyses showing results and number of RCTs included in meta-analyses

Category of intervention	Reference	Intervention	Study design	Results
Surveillance/control	MacKenzie 2006	Intensive supervision	Meta-analysis 31 studies/16 RCTs	No reduction in recidivism
	Renzema and Mayo-Wilson 2005	EM	Systematic review	Evidence too limited to draw conclusions
Deterrent/punitive	Petrosino et al. 2013	Scared Straight	Meta-analysis 9 RCTs	Scared Straight increased recidivism
	Villettaz et al. 2006	Custodial vs. non-custodial sanctions	Meta-analysis 23 studies/5 RCTs	RCTs: No significant difference
	Villettaz et al. 2015	Custodial vs. non-custodial sanctions	Meta-analysis 24 studies/4 RCTs	RCTs: No significant difference; Non-RCTs small difference in favor of non-custodial
	Wilson et al. 2005	Boot camp program vs. alternative	Meta-analysis 43 studies/4 RCTs	No significant difference (RCTs results not different from total analysis)
Disciplinary	Tong and Farrington 2008	Reasoning and Rehabilitation skills training program	Meta-analysis 19 studies/9 RCTs	Results of RCTs? Different from others
	Lipsey et al. 2007	Cognitive-Behavioral Interventions (CBI)	Meta-analysis 58 studies/19 RCTs	CBT Interventions significantly reduced recidivism; Great impact for high risk, higher fidelity, with specific program components; RCTs did not differ from overall
Restorative and skill building	Mitchell et al. 2012a, b, c	Adult drug court	Meta-analysis 92 studies/3 RCTs	Drug court reduced recidivism, no impact on drug use relapse; RCTs supported overall results
	Mitchell et al. 2012a, b, c	Juvenile drug court	Meta-analysis 34 studies/1 RCTs	No significant difference in recidivism or drug use relapse; RCT found lower recidivism for drug court.
Restorative and skill building	Mitchell et al. 2012a, b, c	DWI drug court	Meta-analysis 28 studies/4 RCTs	Drug court reduced recidivism, no impact on drug use relapse; 3

Table 2 (continued)

Category of intervention	Reference	Intervention	Study design	Results
	Mitchell et al. 2012a, b, c	Incarceration-based drug treatment: Therapeutic Communities (TCs); Counseling; Narcotic maintenance (NM); Boot camp (BC) for drug involved offenders	Meta-analysis 74 studies/4 RCTs	of the RCTs agreed with overall analysis Treatment reduced drug use ($n = 22$ evaluations) and recidivism ($n = 73$ TCs) reduced both drug and recidivism use (results from 2 RCTs = stronger reduction); Counseling ($n = 26$) reduced recidivism but not drug use (strongest research designs weaker impacts); No RCTs for narcotic maintenance ($n = 6$) and no impact on recidivism; No RCTs for boot camps ($n = 2$) and no impact on outcomes. No impact
Batterer interventions	Feder et al. 2008	Psycho-educational or cognitive behavioral	Meta-analysis 10 studies/4 RCTs	RCTs found significant reduction in official reports but no impact on victim reports; results mixed for non-experimental designs.
Sex offender interventions	Lösel and Schmucker 2005	Sex offender treatment	Meta-analysis 80 evaluation/6 RCTs	Treated offenders had lower sexual, violent and general recidivism; no difference between RCTs and weaker designs.
Education	MacKenzie 2006,	Academic education programs	Meta-analysis 27 evaluations/1 RCT	Overall reduction in recidivism but generally weak designs; RCT found low recidivism for group in education
Restorative and skill building	MacKenzie 2006,	Vocational education	Meta-analysis 18 evaluations/2 RCTs	One RCT found higher recidivism for education group, one RCT found lower.

Table 2 (continued)

Category of intervention	Reference	Intervention	Study design	Results
Restorative programs	Strang et al. 2013	Restorative justice conferences	Meta-analysis 10 RCTs	Restorative justice is followed by lower recidivism
Services and opportunities	MacKenzie 2006,	Correctional industries	Meta-analysis 4 evaluations/0 RCTs	Weak designs
Employment	Visher et al. 2005, 2006	Non-custodial employment	Meta-analysis 10 RCTs	No impact of programs on recidivism
Juvenile treatment	Baldwin et al. 2012	Family therapy	Meta = analysis 24 RCTs	Functional family therapy, multi-systemic therapy, brief strategic family therapy, multidimensional family therapy reduce delinquency
	Littell 2005	Multi-systemic therapy (MST)	Meta-analysis 8 RCTs	MST has little effect on offending
	Hahn et al. 2005	Treatment foster care (TFC)	Systematic reviews 5 studies/2 RCTs	TFC decreases violence
	Turner and MacDonald 2011	Treatment foster care (TFC)	Meta-analysis 5 RCTs	TFC is followed by lower reported delinquency and fewer criminal referrals

RCT Randomized Controlled Trial

methodologies and found wanting. These interventions focused on increasing the severity of punishments, and increasing the use of incarceration and control over offenders. Boot camps, intensive supervision, electronic monitoring, and drug testing have been popular correctional interventions reflecting the deterrent, disciplinary, and surveillance and control perspective. Because of the popularity of the programs, they became a focus of research and evaluation. At the same time, there was an emphasis on increasing the rigor of research designs so that several of these interventions were studied with strong quasi-experimental or experimental designs.

Surveillance and control programs

Included in this category are interventions based on the idea that closer monitoring and supervision will reduce reoffending. Most of these programs are some type of intensive probation or parole programs (ISP) that are oriented toward increasing contact and supervision. Some programs also include additional services, but programs are categorized as surveillance and control if the major focus is on surveillance and control.

Intensive supervision programs (ISP) were the early programs developed during the “law and order” period. These programs were designed to increase control over parolees or probationers so that they would be caught if they did not comply with conditions of supervision or if they recidivated. Some of the earliest randomized controlled trials (RCTs) conducted in corrections examined the impact of ISP programs. These studies found that there was no reduction in recidivism for those who received ISP (Petersilia and Turner 1993; Folkard et al. 1976). Similar conclusions have been drawn in a more recent study by Barnes et al. (2010) (Table 1) and in a meta-analysis by Mackenzie (2006) (Table 2).

Other researchers have examined regular supervision compared to no supervision or to enhanced supervision, or community supervision (noncustodial sanctions) compared to custodial sanctions. In general, there is little evidence that supervision is better in reducing recidivism than no supervision or that enhanced supervision is better than regular supervision. For example, as reported previously, in their review of meta-analyses Lipsey and Cullen (2007) found a wide range of outcomes, with some comparisons favoring regular supervision and others favoring no supervision or enhanced supervision. The studies included many types of supervision and varied greatly in methodological rigor. Similarly, in a study of a representative sample of over 36,000 prisoners released in 15 states, Solomon et al. (2005) found that parole supervision by itself, compared to unsupervised release, had little effect on the re-arrest rates of released state prisoners. Also, placements in halfway houses and community corrections facilities do not reduce recidivism and at times produce iatrogenic results particularly if technical violations are considered (Latessa et al. 2009; Lowenkamp and Latessa 2005). Thus, there is little evidence that increasing control of offenders in the community by using community supervision or enhanced supervision is successful in reducing criminal activities.

Electronic Monitoring (EM) has become a generic term encompassing a range of different technologies including radio frequency EM, GPS satellite tracking devices, and voice recognition. EM was originally developed to replace custody or imprisonment because the surveillance and control over offenders in the community was

believed to prevent criminal activities by reducing the opportunity to commit crimes (Mackenzie 2006, p. 305). An early systematic review of EM, conducted by Renzema and Mayo-Wilson (2005), concluded that the available evidence was too limited to support any conclusions about the effectiveness of EM (Table 2). In a recent RCT, Killias et al. (2010a) did find that EM was marginally (with borderline significance) better than community service in reducing recidivism (Table 1).

Deterrent and punitive interventions

These interventions attempt to deter youth and offenders from delinquency or reoffending by emphasizing the negative consequences of that behavior or punishing them with more severe punishments in order to change their behavior. The prototypical program to show juveniles the consequences of delinquent behavior is “Scared Straight”-type programs in which juveniles visit prison and talk with prisoners who graphically describe the unpleasant nature of prison conditions. “Scared Straight” programs are designed to deter participants from offending by giving them a first-hand negative view of prison life. Juvenile delinquents or children at-risk of offending are taken to visit a prison where they interact with adult inmates. Petrosino et al. (2003) completed a meta-analysis of nine studies of programs ($n=7$ RCTs), involving organized visits of juvenile delinquents or at-risk children to prisons. They included studies that used an experimental design or a quasi-experimental design with alternative assignment. They found that this intervention was more harmful than doing nothing. In comparison with the control condition, the programs increased later delinquency. Similar conclusions were drawn in a later systematic review by Petrosino et al. (2013) (Table 2).

It has been proposed that a term of imprisonment or increasing the length of prison sentences might act as deterrents. However, in a classic experiment, Berecochea and Jaman (1981) randomly assigned prisoners to be released 6 months early (or not) and found no significant increase in recidivism. In a meta-analysis of community supervision (non-custodial sanctions) compared to custodial sanctions, Villettaz et al. (2006) found that non-custodial sanctions produced statistically significant reductions in recidivism in 11 out of 27 comparisons, custodial sanctions produced significant reductions in only two comparisons, whereas in 14 of the comparisons there were no significant differences between sanctions (Table 2). When they compared only the highest quality evaluations of four controlled experiments and one natural experiment, there were no significant differences in recidivism between custodial and non-custodial sanctions. Thus, the idea that a term of imprisonment will deter people from future criminal activities does not appear to be supported by existing evaluation research. As shown in Table 2, similar conclusions were drawn in an updated review by Villettaz et al. (2015).

Disciplinary

Disciplinary interventions are based on the idea that delinquents and offenders must learn discipline to succeed in a noncriminal life style and that they will benefit from a

highly structured regimen that imposes discipline on them. Correctional boot camps were designed to focus on discipline as well as to provide a more punitive sanction in comparison to serving time in a traditional prison. Correctional boot camps began in adult correctional systems in the United States in 1983 in several states and rapidly grew in popularity, first in adult prison systems and later in juvenile facilities and local jails (MacKenzie and Armstrong 2004; MacKenzie and Herbert 1996; MacKenzie and Parent 2004). By the late 1990s the camps were operating in federal, state and local juvenile and adult jurisdictions in the United States as well as in Canada and the United Kingdom. Boot camps became popular because they fitted well with the “law and order” and “get tough” philosophies of the times. In addition, they made great sound bites for the popular press.

The most comprehensive recent meta-analysis of correctional boot camps, completed by Wilson et al. (2005), examined the empirical evidence on the effects of boot camps and boot camp-like programs on future criminal behavior. Overall they found that the recidivism of boot camp participants was roughly equal to the recidivism of the comparison groups (Table 2).

Studies varied greatly in methodological rigor. Of the 43 independent studies in the analysis, only four were randomized trials. Follow-up analyses revealed that the findings held up independently of the outcome measure that was used in the study and the length of the follow-up. Furthermore the method and design features of the research were only weakly related to the outcomes among studies and did not explain the null findings. While in some studies boot-camp participants had lower recidivism than the comparison group, in other studies the comparison group had lower recidivism, and therefore the overall effect appeared to be “no difference.” Since all of the studies examined the common element of a militaristic boot camp program, the evidence suggests that this defining feature of a boot-camp is not effective in reducing later offending. However, the follow-up analyses suggested that the recidivism of offenders participating in boot camps with a stronger therapeutic treatment focus may be lower than for offenders in boot camps with less emphasis or no emphasis on treatment.

In the UK, Farrington et al. (2002) used a quasi-experimental design to evaluate two rigorous regimes or boot camps for young offenders. An institution in the North of England combined military training with cognitive-behavioral and pre-release employment programs, whereas an institution in the South of England was more of a pure boot camp run by the Army, with no correctional programs. They found that the Northern regime was effective in reducing reoffending but the Southern regime was not. Furthermore, a 10-year follow-up of reconvictions for the Northern sample found that the benefit-to-cost ratio increased over time to 3.93 at the 10-year point (Jolliffe et al. 2013). These projects show that pure boot camps are ineffective in reducing reoffending, but boot camps combined with programs can be effective.

Recent studies of boot camps, conducted after the Wilson et al. (2006) meta-analysis, continue to find mixed results. Using quasi-experimental methods, Wells et al. (2006) and Kurlychek and Kempinen (2006) found that participants in a boot camp with aftercare had lower recidivism than the comparison group. In contrast, in a quasi-experimental study of the Minnesota challenge program, also with aftercare, Duwe and Kerschner (2008) found no impact on recidivism rates although the program did reduce time to reoffending. In another study, one of the few to use an experimental

design, MacKenzie et al. (2007) reported significantly lower recidivism for boot camp releasees in comparison to those who served time in a traditional prison (Table 1). The researchers examined changes in criminogenic attitudes and impulses in a pre-test, post-test design and the impact of these changes on recidivism. They also conducted intensive interviews with inmates. On the basis of these results, the researchers hypothesized that it was not that the boot camp changed offenders in positive ways but instead that the boot camp had protected inmates from the negative impact of the traditional prison experience.

Rehabilitation and skill building programs

These programs are interventions that focus on rehabilitation methods such as drug treatment or providing experiences that will develop skills such as cognitive skills training or educational programs. Many of these programs focus on cognitions or thinking processes. Some of the programs are designed for specific types of offenders such as drug-involved offenders or those who are convicted of sex offenses or of domestic violence.

Cognitive skills “Reasoning and Rehabilitation” is a well-known skills training program developed in Canada by Ross and Fabiano (1985). The most comprehensive evaluation of its effectiveness was conducted by Tong and Farrington (2008), who identified 19 controlled evaluations in the US, UK, Canada, and Sweden, nine of which involved random assignment (Table 2). Over all these studies, offenders who received the program were less likely to be reconvicted, but the effect was relatively small (about an 8 % reduction in reoffending). “Reasoning and Rehabilitation” was later developed into a program called “Enhanced Thinking Skills” in the UK.

Cognitive-behavior therapy (CBT) is one of the most promising rehabilitative treatments for delinquents and offenders. Meta-analyses of these programs show that the programs have a significant desirable impact on future criminal activities (Landenberger and Lipsey 2005; Lipsey and Landenberger 2006; Wilson et al. 2005). Prototypical examples of CBT programs for offenders are the Reasoning and Rehabilitation program (Ross and Fabiano 1985), Moral Reconciliation Therapy (Little and Robinson 1988), Aggression Replacement Training (Glick and Goldstein 1987) and Thinking for a Change (Bush et al. 1997). The programs apply treatment strategies explicitly directed toward bringing about cognitive change and use a cognitive-behavioral approach to bring about the change.

In a recent meta-analysis of CBT programs, Lipsey et al. (2007) identified 58 CBT studies with recidivism outcomes (Table 2). The programs represented or were substantially similar to the recognized “prototypical” programs (listed above). Nineteen of the 58 studies were RCTs. The CBT programs significantly reduced the recidivism of juvenile and adult offenders. There was no significant relationship overall between outcomes and the study design; the effects observed in RCTs did not differ from those observed in quasi-experimental studies. The main emphasis of the study was to examine what characteristics were associated with larger impacts on recidivism. Much of the variation in recidivism could be explained by a small number of variables. These

were (1) the risk level of the participants; (2) how well the treatment was implemented (e.g., fidelity or integrity); and (3) the presence or absence of a few treatment components. Treatments that included anger control and interpersonal problem solving were associated with lower recidivism, while victim impact and behavior modification were associated with smaller effects. With other relevant variables controlled, there were no differences in program effectiveness between juveniles and adults and, similarly, programs were equally effective when delivered in prison or in the community.

Drug treatment As the 1980s drew to a close, it became evident that drug offenders were filling up jails and prisons, so many jurisdictions began to search for ways to reduce drug use among offenders. One strategy that aimed to divert drug offenders from prison and reducing their drug use and associated criminal activities was the drug court. Drug court programs began in Dade County, Florida in 1989 as a diversion program for drug offenders. They rapidly became popular and by 2014 there were about 2800 drug court programs in the United States (Office of Justice Programs 2014). These are specialized courts in which court personnel collaborate to monitor drug-involved offenders' abstinence from drug use by frequent drug testing and compliance with individualized drug treatment programs. Thus the emphasis was not only on drug testing but also on mandatory treatment.

There is a growing body of research evaluating the effectiveness of drug courts. Mitchell and his colleagues completed a recent meta-analysis of drug court evaluations and found that the programs reduced the recidivism of participants (Mitchell et al. 2007, 2012a, b, c). The analysis examined 92 adult drug courts, 34 juvenile drug courts and 28 DWI courts. Only the adult courts and the DWI courts significantly reduced recidivism. None of the courts significantly reduced drug use relapse. However, since few of the evaluations included this measure, this result could be due to a lack of statistical power to detect effects.

Of the total number of evaluations in the Mitchell et al. (2012a, b, c) meta-analysis, RCTs were used in only three (3 %) of the adult studies, four (14 %) of the DWI studies and only one (3 %) of the juvenile studies (Table 2). When only the three experimental evaluations of adult drug courts (Gottfredson et al. 2006; Shanahan et al. 2004; Turner et al. 1999) were considered, the evidence still supported the effectiveness of adult drug courts, although there was inconsistency in the durability of the effects over time. Three of the four experimental evaluations of DWI drug courts found reductions in recidivism but one found a negative impact (MacDonald et al. 2007). This led the researchers to conclude that the meta-analysis of DWI drug courts suggests that they reduce recidivism but the conclusion is not definitive (Mitchell et al. 2014). The researchers identified three evaluations of juvenile drug courts using RCTs but two (Dickie n.d.) of these suffered from differential attrition of participants in the study and they were, therefore, classified as quasi-experimental designs in the analyses. The results from the one RCT of a juvenile drug court indicated that it had a small impact on recidivism and these results were consistent when the two RCTs classified as quasi-experimental were entered into the analysis. Thus, while the results from the three types of drug courts differ somewhat in the strength of the findings, overall they all appear to have a significant impact in reducing recidivism.

Jurisdictions also attacked the drug problem by starting to provide drug treatment in correctional facilities. A considerable body of evidence supporting the effectiveness of

these programs has accumulated; however, some modalities appear to be more effective than others. Mitchell et al. (2012a, b, c) completed a meta-analysis of incarceration-based drug treatment and examined four modalities: therapeutic communities (TCs), group counseling, boot camps for drug offenders, and narcotic maintenance programs (Table 2). Overall, they found that the programs were effective in reducing recidivism in the 74 evaluations conducted between 1980 and 2011, but the treatment was not followed by a reduction in substance use relapse.

Program effectiveness varied by treatment modality. TCs produced the greatest reductions in both recidivism (a significant reduction) and relapse to substance use (a trend toward significance). Only two of the 34 TC studies used an experimental design and, contrary to other studies concluding that more methodologically rigorous studies find weaker effects (Weisburd 2010; Weisburd et al. 2001), these RCTs reported by far the strongest treatment effects. Twenty-six of the studies were classified and analyzed as group counseling. The counseling studies included an eclectic group of programs including a variety of elements such as peer-based groups as well as individual sessions, 12-step approaches, life skills training, and cognitive-behavioral components. Overall, the group counseling programs significantly reduced recidivism but did not have a significant impact on substance use relapse. However, the authors note that it is difficult to untangle the effects of group counseling from the effects found for other program modalities. Furthermore, studies with the strongest designs (strong quasi-experimental and experimental designs) did not find significance for either recidivism or relapse, and, thus, if we focus on experimental designs these programs do not appear to reduce recidivism. Six of the programs were narcotic maintenance programs and these had a strong impact on reducing drug use but no effect on recidivism. Correctional boot camps had no impact on recidivism or relapse. Mitchell et al. (2012a, b, c) found that aftercare magnified the treatment effects, suggesting that continuity of care, both within the prison and after release, is an important component of the treatment.

Batterer interventions Another type of offender who has received attention in corrections is the batterer. Batterers are convicted of domestic violence or assaultive behavior towards those to whom they are married, cohabitating or in intimate partnerships. Feder et al. (2008) conducted a systematic review and meta-analysis of ten court-mandated batterer intervention programs including pre-trial diversion programs (Table 2). The goal was to examine whether these programs reduced the future likelihood of re-assaulting above what would have been expected after routine legal responses without the intervention. Included in the analyses were studies using (1) experimental designs ($n=4$); (2) quasi-experimental designs using matching or statistical controls; and (3) rigorous quasi-experimental designs but using treatment dropout comparisons. The studies had to include measured official or victim reports of future domestic violent behavior. The results indicated a modest benefit when the outcome measured was official reports of domestic violence whereas there was no effect for victim reported outcomes. The experimental studies did find a modest reduction in official reports for those participating in the batterer programs. The only studies showing a consistently large, positive impact on reducing reoffending were the studies comparing treatment dropouts to completers. The researchers conclude that these results raised questions about the value of these studies. The large effect in the

treatment dropout studies is most likely due to selection effects and not the effect of the program, and this is a typical problem with such studies.

In a more recent experiment examining programs for batterers, Mills et al. (2013) compared a group-based mandated batterer intervention program (BIP) with a restorative justice-based program for domestic violence offenders called Circles of Peace (CP) (Table 1). The CP participants recidivated less than the BIP group but the only differences that were significant were for comparisons at 12 months or less for non-domestic violence offenses. Differences were not significant for longer-term follow-ups (up to 24 months) or for any follow-up time for domestic violence arrests. The researchers concluded that the results suggest that CP programs may be a viable method for sanctioning batterers.

Sex offender treatment Treatment for sex offenders is of concern to most people because of the seriousness of the offenses. Since sex offenses are considered so serious it is difficult to form randomized control groups. Lösel and Schmucker (2005) completed a meta-analysis to examine the impact of sex offender treatment (Table 2). They identified 66 reports that met the inclusion criteria (sex offender subjects, intervention designed to reduce recidivism, recidivism outcome measure, control group design). These 66 reports included 80 comparisons that could be used in the analyses, but only six were randomized controlled trials. For various reasons, including poor research designs, surgical castration ($n=8$) and hormonal studies ($n=6$) were omitted from most analyses. Overall the researchers found that treated offenders had lower sexual, violent, and general recidivism. There were no outcome differences between randomized designs and other designs. Treatments with a cognitive orientation and treatments designed specifically for sexual offenders were more effective than other treatments.

Education Most correctional facilities offer education programs. Instead of targeting offenders convicted of particular crimes, these programs provide a variety of different types of programs. Harlow (2003) found that over 90 % of state prisons, all federal prisons and almost 90 % of private prisons offered education programs. Various types of education programs come under the rubric of correctional education, including adult basic education (ABE), GED or high school, vocational education, postsecondary education/college (PSE) and life skills. Conspicuously absent from the research literature in the area of education is a discussion of the theoretical explanation for the connection between education and changes in offending behavior (MacKenzie 2012; MacKenzie and Zajac 2013). It may be that education is a mechanism for improving cognitive skills and that such changes may lead to a reduction in criminal activity. On the other hand, education may reduce offending by increasing job skills and thereby employability.

In general, research demonstrates that programs such as basic education, GED, PSE and vocational training are effective in reducing recidivism. MacKenzie and her colleagues conducted systematic reviews and meta-analyses of evaluations of correctional and vocational education programs for adults (MacKenzie 2006; Wilson et al. 1999, 2000) (Table 2). They included both quasi-experimental and experimental designs in an analysis of 27 evaluations of education programs including ABE ($n=6$), GED ($n=3$), combined ABE and GED ($n=5$) and PSE ($n=13$). Disappointingly little information was provided in the research manuscripts about the program

characteristics. Many studies only compared those who participated with those who did not and did not provide information on completion rates. While the results indicated that the programs had a desirable impact on later criminal activities, the results cannot be attributed with complete assurance to the effect of the interventions because the vast majority of the studies included in the meta-analyses used naturally occurring groups of participants compared to non-participants. However, in the one study with an experimental design, those who received the educational program did have lower recidivism rates.

Vocational education is one of the most widely implemented education programs in correctional systems because it addresses the high incidence of academic and employment failure of offenders. Meta-analyses of these programs have found that vocational education is successful in reducing later criminal activities and increasing the employment of offenders (MacKenzie 2006; Wilson et al. 1999, 2000). As with general education, these results have to be cautiously accepted because many of the studies suffered from problems that suggest that the comparison groups may have differed substantially prior to the intervention. For example, MacKenzie (2006) identified 18 studies in her analysis but only two used experimental designs (Table 2). Both of these studies evaluated programs for juveniles. Disappointingly, their results did not agree. Bloom et al. (1994) found that those who participated had higher recidivism while, in contrast, Lattimore et al. (1990) found that the program significantly reduced recidivism.

Restorative justice programs Strang et al. (2013) published a Campbell Collaboration review of the effect of face-to-face restorative justice conferences on recidivism. These conferences bring together offenders, victims, and their supporters (relatives and community members), in order to decide what the offender should do to repair the harm caused by the crime. Strang et al. reviewed ten randomized experiments with recidivism outcomes (Table 2). They only included experiments where the offender's consent was obtained in advance of the randomization and where an intent-to-treat analysis was carried out. A meta-analysis showed that, over the ten experiments, the weighted mean effect size was $d = .16$, corresponding to an 8 % decrease in recidivism. A cost-benefit analysis indicated that \$8 was saved for every \$1 expended on restorative justice.

Services and opportunities

These interventions provide at-risk juveniles and offenders with opportunities such as in employment or housing. Many of the reentry programs offer employment opportunities or housing for those who are released from prison or jail. Although these programs provide opportunities they do not necessarily include any training nor do they focus on changing thinking or cognitions. Thus, those who are given these opportunities may not be cognitively prepared to accept them and make good use of them. For example, offenders may be given housing and an opportunity for a job but this does not necessarily mean that they will give up activities such as drug use or late-night parties so that they will be able to get up to make it to work on time. For this reason we separate the interventions that focus on providing opportunities from the rehabilitation and skill building programs.

“Correctional industries” refer to a wide range of employment-related activities occurring during incarceration. These industries produce various products and services, usually for government agencies, but sometimes also for the private sector. Given the large number of industry programs, it is surprising that so few evaluations of them have been completed (MacKenzie 2006; Wilson et al. 1999, 2000). Most likely this is because the industries are not considered to be treatment or intervention programs. In a search of the literature, MacKenzie (2006) identified only four prison industry evaluations (Table 2). None of the studies used an experimental design. Only two were assessed as methodologically sound (Maguire et al. 1988; Saylor and Gaes 1992). In these two, the participants had lower recidivism rates but in only one study (Saylor and Gaes 1992) was the difference significant. Furthermore, both studies used preexisting groups that differed prior to the intervention.

Similar to research on prison industries, little research exists evaluating other types of work and multi-component work programs. Wilson and his colleagues (1999) identified five work program evaluations of sufficient research rigor to be included in their meta-analysis of education and work programs. The programs varied greatly in their components. However, the analysis found little evidence that these programs effectively reduced recidivism. In a later systematic review, MacKenzie (2006) located eight studies with moderate to rigorous research designs but only two of these used experimental designs (Clark et al. 1992; Uggen 1997, 2000). Overall, the programs did not demonstrate an impact in reducing recidivism (Table 2). Of the two studies employing experimental designs, Uggen found no significant differences between those who received the programs and the control group, while Clark et al. found no differences in two out of the three outcome measures. On average, controls were significantly more likely to engage in misconduct than the treated group.

In another review of work programs, Visher et al. (2005, 2006) examined non-custodial employment programs for ex-offenders and found similar results to the earlier studies (Table 2). In the meta-analysis, they included only randomized trials that examined employment services for recently released prisoners and job training or job placement programs for people who had been arrested, convicted or incarcerated for a criminal charge. The recidivism of offenders who received employment interventions was not reduced. However, they caution that recently developed employment-focused interventions have not been adequately evaluated and that the majority of the studies they identified were more than 10 years old at the time of the meta-analysis.

Programs for juvenile delinquents

The three most important programs for delinquents are Functional Family Therapy (FFT), Multisystemic Therapy (MST), and Treatment Foster Care (TFC). FFT was developed by Alexander and Parsons (1973) in Utah. This aimed to modify patterns of family interaction by modeling, prompting, and reinforcement, to encourage clear communication between family members of requests and solutions, and to minimize conflict. Essentially, all family members were trained to negotiate effectively, to set clear rules about privileges and responsibilities, and to use techniques of reciprocal reinforcement with each other. The program was evaluated by randomly allocating delinquents to experimental or control conditions. The results showed that this

technique halved the recidivism rate of minor delinquents in comparison with other approaches (client-centered or psychodynamic therapy).

Sexton and Alexander (2000) published a more recent randomized trial of FFT (Table 1). In this, juvenile offenders were randomly assigned to receive either FFT or the usual probation services. They found that, overall, FFT was no more effective than probation in reducing felony recidivism, but FFT was better for therapists who had high adherence to the FFT model (see Table 1). There has been no systematic review of FFT specifically, but Baldwin et al. (2012) reviewed RCTs of FFT, MST, Brief Strategic Family Therapy, and Multidimensional Family Therapy. They concluded that all four types of family therapy reduced later delinquency, but there was insufficient evidence to determine which was best (see Table 2).

MST is an important multiple-component family preservation program that was developed by Henggeler et al. (2009) in South Carolina. The particular type of treatment is chosen according to the particular needs of the youth. Therefore, the nature of the treatment is different for each person. MST is delivered in the youth's home, school and community settings. The treatment typically includes family intervention to promote the parent's ability to monitor and discipline the adolescent, peer intervention to encourage the choice of prosocial friends, and school intervention to enhance competence and school achievement.

In an evaluation in Missouri, Borduin et al. (1995) randomly assigned juvenile offenders (with an average age of 14) either to MST or to individual therapy focusing on personal, family, and academic issues. Four years later, only 26 % of the MST offenders had been rearrested, compared with 71 % of the individual therapy group. Later follow-ups to age 29 (Schaeffer and Borduin 2005) and age 37 (Sawyer and Borduin 2011) confirmed the cumulative benefits of MST.

Unfortunately, two meta-analyses of the effectiveness of MST reached contradictory conclusions. Curtis et al. (2004) found that it was effective, but Littell (2005) concluded that it was not effective (Table 2). Henggeler et al. (2006) criticized the Littell review, for example arguing that she gave too much weight to an unpublished Canadian evaluation by Leschied and Cunningham (2002) that found no effect. In reply, Littell (2006) argued that the (independent) Canadian evaluation was at least as good quality as the other evaluations, and that in any case the other evaluations, taken together, did not yield desirable results. There is clearly a great need for a more up-to-date systematic review and meta-analysis of MST by a new, independent, research team.

Chamberlain and Reid (1998) in Oregon evaluated TFC, which was used as an alternative to custody for delinquents. In TFC, families in the community were recruited and trained to provide a placement for delinquent youths. The TFC youths were closely supervised at home, in the community, and in the school, and their contacts with delinquent peers were minimized. The foster parents provided a structured daily living environment, with clear rules and limits, consistent discipline for rule violations and one-to-one monitoring. The youths were encouraged to develop academic skills and desirable work habits. In the evaluation, chronic male delinquents were randomly assigned to TFC or to regular group homes where they lived with other delinquents. A 1-year follow-up showed that the TFC boys had fewer criminal referrals and lower self-reported delinquency.

Similarly encouraging results were obtained in a more recent evaluation of TFC for delinquent girls. Chamberlain et al. (2007) randomly assigned delinquent girls to TFC

or group care and concluded that the TFC girls had fewer criminal referrals in a 2-year follow-up period (Table 1). The effectiveness of TFC has been confirmed in systematic reviews and meta-analyses. Hahn et al. (2005) concluded that TFC led to a decrease in violence, while Turner and MacDonald (2011) found that TFC was followed by less reported delinquency and fewer criminal referrals (Table 2).

Conclusions

From 1988 through early 2002 many of the programs implemented in corrections have been based on the idea that increasing surveillance and control over delinquents and offenders and increasing the severity of punishment would reduce future criminal activity. Research examining these programs using experimental designs demonstrates that interventions based solely on these philosophies have not been effective. Our examination of the research demonstrates that there is little if any evidence that these types of programs reduce recidivism. Prison sentences, correctional boot camps, intensive community supervision and other interventions designed to increase control or make punishment more onerous are not effective in reducing recidivism. In fact, some programs (such as “Scared Straight”) actually appear to increase later offending.

Another disappointing finding is that there is little evidence that providing delinquents and offenders with opportunities in the community like jobs and housing is successful in reducing recidivism if these opportunities are not combined with some type of rehabilitation that focuses on thinking, problem solving, or cognitions. Many of the reentry programs focus on providing opportunities for employment or housing, yet offenders need more than just opportunities. Without rehabilitation components these increased opportunities are not effective. We cannot just offer delinquents and offenders opportunities without attempting to provide them with the attitudes, thought processes and skills needed to take advantage of the opportunities. We need to address their criminal thinking and decision making before providing opportunities. The programs that work best are those that address the thinking skills of the participants.

The good news is that some interventions are effective in reducing future recidivism. Effective interventions are developed from the perspective of therapeutic rehabilitation. These programs address the specific problems that are associated with offenders’ criminal activities. Cognitive skills training, drug treatment, whether associated with a drug court or provided in prison or in the community, and education are examples of some of the interventions that have an impact on recidivism. Less clear is the impact of programs for batterers and sex offenders.

The number of experiments in corrections has increased over the past 10 years, yet they are still a small proportion of the total number of studies examining the impact of interventions on recidivism. As a result, few meta-analyses can include only RCTs. Most meta-analyses include both RCTs and quasi-experimental designs and test whether the overall results differ depending upon the quality of the research design. Many times no differences are found between the results and the researchers conclude that this means that, if the intervention is effective in the overall analysis, then it is the same for the stronger research designs. The problem here is an argument based on a null hypothesis. Often there is insufficient power to detect differences between the RCTs and the quasi-experimental designs because there are too few RCTs. Thus, while we

have seen an increase in the number of RCTs in corrections, enough certainly to permit us to draw some conclusions about which general categories of interventions are effective, we are still far from being able to identify the specific intervention components that lead to desirable changes in particular types of offenders.

One significant development that has increased the interest in more rigorous research designs has been the Campbell Collaboration. An important model for the development of systematic reviews has come from the Cochrane Collaboration, which seeks to prepare and maintain systematic reviews of health care interventions (see www.cochrane.org). The Cochrane Library is widely recognized as the best source of evidence on the effectiveness of evidence-based medicine (Farrington et al. 2011). The Campbell Collaboration was designed to create an infrastructure for reviews on what works in areas such as education, social welfare, and criminology. One of the first major challenges that had to be addressed by the Campbell Crime and Justice Group (CCJG) was to determine what criterion of methodological quality should be set for including evaluations in the systematic reviews. Several members of the group argued for using only RCTs in the reviews since these were able to demonstrate effects most convincingly (with the highest internal validity). However, setting the “gold standard” of randomized experiments would inevitably exclude many evaluations and would severely limit the number of evaluation areas that could be studied in the systematic reviews. As shown in Table 2, many of the areas evaluated in the meta-analyses contained relatively few RCTs and therefore, would not have been included in the Crime and Justice systematic reviews. Researchers conducting the systematic reviews were asked to clearly identify and justify the research designs included in their analyses. It is obvious that more needs to be done to increase the number of RCTs so that we are able to rule out alternative explanations for results and provide more assistance to decision makers as they struggle to develop evidence-based interventions.

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