

ORIGINAL ARTICLE

How effective is the “Reasoning and Rehabilitation” programme in reducing reoffending? A meta-analysis of evaluations in four countries

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Abstract

This article aims to review the effectiveness of the “Reasoning and Rehabilitation” programme in reducing recidivism. Sixteen evaluations (involving 26 separate comparisons) were located in which experimental and control groups were compared. A meta-analysis showed that, overall, there was a significant 14% decrease in recidivism for programme participants compared with controls. This programme was effective in Canada, the USA, and the UK. It was effective in community and institutional settings, and for low-risk and high-risk offenders. Smaller and larger evaluation studies, and older and newer studies, concluded that the programme was effective. Future evaluations should use larger samples, randomized controlled trials and better measures of recidivism (including self-reports, numbers, types and costs of offences committed).

Keywords: *Reasoning and Rehabilitation, cognitive-behavioural, meta-analysis, correctional effectiveness*

Introduction

The aim of cognitive-behavioural treatment programmes is to change the criminogenic thinking of offenders. Cognitive skills are taught to enable offenders to react more appropriately to situations that trigger their criminal behaviour. The “Reasoning and Rehabilitation” (R&R) programme is one example. It was developed in Canada and seeks to teach offenders the following cognitive and behavioural skills: social skills, lateral thinking, critical thinking, values education, assertiveness training, negotiation skills, interpersonal training and social perspective taking (Ross, Fabiano & Ewles, 1988).

The main aim of this article is to review existing knowledge on the effectiveness of the R&R programme. It presents a systematic review of R&R evaluations followed by a meta-analysis of their findings. The key questions addressed are:

1. Is the R&R programme effective in reducing reoffending?
2. Does it work better in community or institutional settings?

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3. Does it work better for high-risk or low-risk offenders?
4. Does it work better in one country than in another?
5. Does it work better on a voluntary rather than non-voluntary basis?
6. What improvements might be made to the programme?

Redondo, Sanchez-Meca and Garrido (1999) carried out a meta-analysis of all treatment interventions for offenders carried out in Europe. Thirty-two published and unpublished studies from 1980 to 1991 were included in their study. They found that, on average, treatment caused a 12% decrease in recidivism. Behavioural and cognitive-behavioural programmes were the most effective treatment modalities, causing a 23% reduction in recidivism on average. Programmes applied to violent offenders were the most successful, in agreement with the hypothesis that treatment is more effective for higher-risk cases.

There have been four previous reviews of evaluations of the R&R programme, but the present article presents the first systematic review using meta-analytic techniques. Unlike narrative reviews, systematic reviews have explicit objectives, explicit criteria for including or excluding studies, and explicit statements about methods used to search for studies (Farrington & Petrosino, 2001). A meta-analysis is a method of summarizing comparable effect sizes in each study to draw conclusions about what works, and about factors influencing effectiveness (Lipsey & Wilson, 2001).

Thinking Straight, edited by Ross and Ross (1995c), is devoted entirely to research on the R&R programme. It summarizes the R&R model and programme delivery. It includes chapters on R&R programme implementation in Canada, the USA, the UK and Spain. Some of the chapters include an evaluation of the programme using attitude change and/or recidivism as outcome measures. However, the treatment effects of the various evaluations were not combined in a meta-analysis.

Robinson and Porporino (2001) carried out a narrative review of the R&R programme as a treatment for adult, substance-abusing or juvenile offenders. They concluded that the programme was effective for offenders who have cognitive skills deficits and have a medium to high risk of reoffending. Again, the effect sizes in the various evaluations were not combined in a meta-analysis.

Allen, MacKenzie and Hickman (2001) used the Maryland Scale of methodological quality to assess the effectiveness of the R&R programme based on seven evaluations. They concluded that, despite somewhat contradictory evidence, the R&R programme was effective in reducing recidivism. This evaluation is noteworthy because it took methodological quality into account and listed all the evaluations. However, there was an overlap in samples used; the seven evaluations included only five independent samples. Allen et al. (2001) did not conduct a meta-analysis, and relied on the statistics provided by the authors in drawing conclusions about effectiveness.

Pearson, Lipton, Cleland and Yee (2002) carried out a meta-analysis to assess the effectiveness of offender treatment programmes. Cognitive-behavioural interventions were found to be effective in reducing recidivism. The R&R programme was included within the cognitive-behavioural treatment category. A meta-analysis of seven R&R evaluations showed that the programme was effective, with a weighted mean r of 0.147. However, Pearson et al. (2002) did not specify which studies were used in their meta-analysis, nor do they mention whether this effect size was statistically significant.

The R&R programme

Rationale

Based on their empirical research that sought to identify effective intervention strategies for offending behaviour, Ross and Fabiano (1985) proposed a cognitive model of offender rehabilitation and delinquency prevention. The main principle is that cognition plays a vital part in criminal behaviour. Deficits in cognitive skills influence the onset and maintenance of offending behaviour. Offenders lack cognitive skills because they have not been taught them, not because of their lower intelligence or neurological deficits. Their failure to learn cognitive skills could be caused by problems in their social environment, such as ineffective parental monitoring and supervision or poor schooling.

Due to their lack of social skills, offenders lack social competence in areas of self-control, critical reasoning, cognitive style, interpersonal problem-solving, social perspective-taking, empathy, values and meta-cognition (Ross & Fabiano, 1985). The cognitive model proposes that the acquisition of these thinking skills will enable offenders to be better motivated to withstand “personal, situational, economic and interpersonal pressures towards illegal behaviour” (Ross & Ross, 1995a, p. 33).

Components

The aim of the multi-modal R&R programme is to teach offenders “how to think, not what to think” (Robinson & Porporino, 2001, p. 180). The idea is that, when they are equipped with thinking skills, offenders will make prosocial behavioural choices that will allow them to move out of an offending lifestyle, which had previously been reinforced by poor thinking skills or criminal thinking.

The R&R programme consists of 36 two-hour sessions, and it is delivered to groups of six to 12 participants (Robinson & Porporino, 2001). Ideally, there should be two to four sessions a week, but this number can be compressed or lengthened to suit the institution and/or the offenders’ schedules (Ross & Ross, 1995b). Teaching takes place mainly through small group discussion and Socratic questioning.

Activities that take place in a teaching session may include role-playing, thinking games, learning exercises, dilemma puzzles and problems (Ross & Ross, 1995b). These activities challenge the offender’s egocentric thinking and increases thinking, perspective-taking and reasoning skills.

Based on the cognitive model described in the previous section, the R&R programme has nine components: problem solving, social skills, negotiation skills, management of emotions, creative thinking, values enhancement, critical reasoning, skills in review and cognitive exercises. These components are interlinked, allowing for repetition so that the skills can be practised in different contexts (Ross & Ross, 1995b).

Selection criteria

The R&R programme is targeted at medium-to high-risk offenders. It is not suitable for offenders with an IQ below 70 as they may have inadequate verbal skills to understand the content; for cognitively skilled offenders because their antisocial behaviour is not caused by cognitive deficits; or for offenders with psychiatric problems (Ross & Ross, 1995b).

Porporino and Fabiano (2000) suggest a pre-programme session where trainers meet participants one-to-one to explain the rationale of the programme and to clarify any doubts. A semi-structured cognitive-behavioural interview should also be carried out during this meeting to assess the extent and nature of cognitive deficits.

Evaluations

This section summarizes R&R programme evaluations that have compared experimental and control groups and have provided recidivism data as an outcome measure. Outcomes other than recidivism are not reviewed. Table I summarizes key features of the evaluations and Table II summarizes key results.

Published and unpublished studies that were written in English and that specifically mentioned the R&R model were included in this review. A literature search was carried out in Criminal Justice Abstracts, PsycINFO and the National Criminal Justice Reference Service Abstracts using “reasoning and rehabilitation” or “cognitive skills training” as keywords. Literature reviews of the R&R programme (e.g. Robinson & Porporino, 2001) were consulted. One of the programme developers, Frank Porporino, was also contacted. Studies were excluded if there were less than 40 participants in total in the evaluation (Kownacki, 1995) or if no recidivism outcome was reported (e.g. de Maret, 1991; Garrido, 1992, 1995). We were unable to obtain one evaluation (Robinson, 1994). We are very grateful to Lawrence Bench, Anne Berman, Jenny Cann, Caroline Friendship, Rebecca Murphy, Emma Palmer and Pat van Voorhis for providing information.

For evaluations that included more than one follow-up period, the outcome at or closest to the 12-month follow-up period was used in the meta-analysis. The outcome data for the experimental R&R participant group are based on initial allocation, including both completers and dropouts from the programme. Robinson (1995) rehearsed arguments for and against the inclusion of experimental dropouts when comparing outcomes with the control group. The argument for including dropouts is to maintain the benefits of the original random assignment in equating experimental and control conditions, since completers and dropouts are self-selected groups. It cannot necessarily be concluded that the R&R programme worked better for completers; they may have been better than controls to start with.

The alternative argument is that dropouts should be excluded on the grounds that they have not completed the full “dosage” of training stipulated by the programme, making them similar to controls in this respect. From this perspective, the inclusion of dropouts in comparisons with controls would underestimate the programme effect. As we are most concerned with internal validity and the comparability of experimental and control groups, we have compared participants (completers and dropouts) with controls in our meta-analysis (Table III). However, the results for both programme participants and completers (if data are available) are reported in this narrative review.

The sample size shown in Table I refers to the numbers followed up and included in the meta-analysis, not the numbers initially allocated to experimental or control groups. Recidivism of participants is shown in Table II. Where studies reported more than one recidivism outcome, rearrest or reconviction was analysed in Table III as the most important outcome, since decisions about revocation, violation and return to prison may be biased by the knowledge of what treatment an offender received.

Table I. Key features of the evaluations.

Study authors (year)	Sample size	Mean age	Treatment setting	Design
Canada				
1. Ross et al. (1988)	E: 22 C: 23	E: 24.1 C: 24.1	Probation	Experimental-control, random assignment
2. Porporino et al. (1991)	E: 40 C: 23		Institutional	Waiting list control
3. Robinson (1995) – low risk	E: 838 C: 173	E: 29.0 C: 28.9	Community, institutional	Experimental-control, random assignment, waiting list control
Robinson (1995) – high risk	E: 835 C: 196			
USA				
4. Johnson & Hunter (1995)	E: 47 C: 51		Probation	Experimental-control, random assignment
5. Pullen (1996)	E: 20 C: 20	E: 16.3 C: 16.5	Probation	Experimental-control, random assignment
6. Murphy & Bauer (1996)	E: 33 C: 16	E: 36.1 C: 36.7	Institutional	Experimental-control, random assignment
7. Austin et al. (1997)	E: 71 C: 65		Probation, Parole	Experimental-control, random assignment
8. van Voorhis et al. (2001) – low risk	E: 163 C: 149	E: 30.1 C: 30.5	Parole	Experimental-control, random assignment
van Voorhis et al. (2001) – high risk	E: 66 C: 83			
9. van Voorhis et al. (2002) – low risk	E: 102 C: 94	E: 31.9 C: 31.9	Parole	Experimental-control, random assignment
van Voorhis et al. (2002) – high risk	E: 351 C: 375			
10. Bench (2002)	E: 63 C: 70		Institutional	Either random assignment or retrospective quasi-experimental control
UK				
11. Raynor & Vanstone (1994)	E: 107 C: 100	E: 22.9 C: 22.7	Probation	Quasi-experimental
12. Friendship et al. (2003) – low risk	E: 101 C: 586		Prison	Retrospective quasi-experimental
Friendship et al. (2003) – medium-low risk	E: 147 C: 390			
Friendship et al. (2003) – medium-high risk	E: 166 C: 424			
Friendship et al (2003) – high risk	E: 253 C: 401			
13. Falshaw et al. (2003) – low risk	E: 310 C: 930		Prison	Retrospective quasi-experimental
Falshaw et al. (2003) – high risk	E: 339 C: 1017			
14. Cann et al. (2003) – low-risk	E: 1039 C: 1039		Prison (adults)	Retrospective quasi-experimental
Cann et al. (2003) – high risk	E: 1156 C: 1156			
Cann et al (2003) – medium-low risk	E: 189 C: 189		Prison (young offenders)	

Table I (Continued)

Study authors (year)	Sample size	Mean age	Treatment setting	Design
Cann et al. (2003) – high risk	E: 1345 C: 1345			
15. Mitchell & Palmer (in press)	E: 31 C: 31	E: 17.5 C: 17.8	Prison	Retrospective quasi-experimental
Sweden				
16. Berman (in press)	E: 276 C: 451		Prison and probation	Retrospective, quasi-experimental

Note: E, experimental group; C, control group.

R&R in Canada

1. *The Pickering Project*. High-risk male probationers were randomly assigned to one of three groups: regular probation ($n=23$), regular probation with life skills training ($n=17$), or regular probation with cognitive skills (R&R) training ($n=22$) (Ross et al., 1988). The life skills component provided training in areas of money management, leisure activities and employment-seeking skills. Offenders in this condition received the same number of hours of training as the cognitive skills group. In our evaluation, we compared R&R with regular probation.

The outcome was the percentage reconvicted during a nine-month follow-up period (Table II). The differences between the R&R group, life skills group and regular group were statistically significant (Ross, Fabiano & Diemer-Ewles, 1995). Differences between the R&R group and the regular probation group were also statistically significant (Ross et al., 1995). Of those convicted, none of the probationers in the cognitive skills group were imprisoned, while 30% of regular probationers and 11% of those in the life skills group were imprisoned. This evaluation was limited by the small number of participants in each group.

2. *Pilot Implementation, Correctional Service Canada*. Offenders were selected based on their high risk and high need levels (Fabiano, Porporino & Robinson, 1990a; Fabiano, Robinson & Porporino, 1990b; Porporino, Fabiano & Robinson, 1991; Robinson, Grossman & Porporino, 1991). There were 50 high-risk offenders in the experimental R&R group and 26 offenders in the waiting list control. The two groups were comparable in age, IQ and sentence length. The non-completion rate in the experimental group was 4%. Offenders in both groups had the option of participating in other programmes (e.g. education, substance abuse). More controls participated in such programmes than R&R participants, with significantly more controls attending vocational programmes compared to programme participants (Fabiano et al., 1990b).

Recidivism was operationally defined as re-admission to prison with or without a new conviction. The first follow-up was carried out for 33 offenders who had been conditionally released. The follow-up period was at least three months, with an average period of 6.2 months (Fabiano et al., 1990a). Fewer programme participants were readmitted for new offences or technical violations (26.3%) compared to controls (35.7%). The second follow-up was carried out for 63 offenders who had been conditionally released (Table I). The follow-up period was at least six months, with an average period of 19.7 months (Porporino et al., 1991; Table II). The main limitation of this study was that the two groups were not

Table II. Key results of the evaluations.

Study authors (year)	Follow-up periods (months)	Recidivism measure (%)		
		Reconviction/ rearrest (OR)	Revocation/technical violation (OR)	Return to prison (OR)
Canada				
1. Ross et al. (1988)	9	E: 18.1%; C: 69.6% (10.29*)		
2. Porporino et al. (1991)	6	E: 20%; C: 30.4% (1.75)	E: 25%; C: 21.7% (0.83)	E: 45%; C: 52.1% (1.33)
3. Robinson (1995) – low risk	12	E: 14.2%; C: 20.2% (1.53*)	E: 20.9%; C: 21.4% (1.03)	E: 35.1%; C: 41.6% (1.34)
Robinson (1995) – high risk		E: 30.2%; C: 30.3% (1.00)	E: 28.5%; C: 27.2% (0.91)	E: 58.7%; C: 57.4% (0.95)
USA				
4. Johnson & Hunter (1995)	8		E: 25.5%; C: 29.4% (1.22)	
5. Pullen (1996)	6	E: 20%; C: 25% (1.33)	E: 5%; C: 15% (3.35)	
6. Murphy & Bauer (1996)	9	E: 39.4%; C: 75% (4.62*)		
7. Austin et al. (1997)	12	E: 25.4%; C: 32.3% (1.41)		
8. van Voorhis et al. (2001) – low risk	12	E: 34.4%; C: 36.2% (1.09)		E: 40.0%; C: 40.8% (1.03)
van Voorhis et al. (2001) – high risk		E: 40.9%; C: 51.8% (1.55)		E: 47.8%; C: 54.8% (1.32)
9. van Voorhis et al. (2002) – low risk	12	E: 17.6%; C: 14.8% (0.82)		E: 18.3%; C: 14.9% (0.78)
van Voorhis et al. (2002) – high risk	12	E: 17.6%; C: 43.2% (1.15)		E: 39.2%; C: 42.6% (1.16)
10. Bench (2002)		E: 17.5%; C: 25.4% (1.40)		
UK				
11. Raynor & Vanstone (1994)	12	E: 43.9%; C: 40% (0.85)		
12. Friendship et al. (2003) – low risk	24	E: 5%; C: 7.8% (1.64)		
Friendship et al. (2003) – medium-low risk		E: 17.7%; C: 32.3% (2.22*)		
Friendship et al. (2003) – medium-high risk		E: 43.4%; C: 54% (1.53*)		
Friendship et al. (2003) – high risk		E: 74.7%; C: 79.6% (1.32)		
13. Falshaw et al. (2003) – low risk	24	E: 13.5%; C: 15.2% (1.14)		
Falshaw et al. (2003) – high risk		E: 63.1%; C: 61.2% (0.92)		
14. Cann et al. (2003) – medium-low risk (youth)	12	E: 5.8%; C: 9.0% (1.60)		
Cann et al. (2003) – high risk (youth)		E: 37.5%; C: 39.3% (1.08)		
Cann et al. (2003) – low risk (adults)		E: 5.4%; C: 5.4% (1.00)		

Table II (Continued)

Study authors (year)	Follow-up periods (months)	Recidivism measure (%)		
		Reconviction/rearrest (OR)	Revocation/technical violation (OR)	Return to prison (OR)
Cann et al. (2003) – high risk (adults)		E: 29.5%; C: 32.9% (1.17)		
15. Mitchell & Palmer (in press)	18	E: 80.6%; C: 83.9% (1.25)		E: 58.1%; C: 64.5% (1.31)
Sweden				
16. Berman (in press)	36	E: 54.0%; C: 60.3% (1.30)		

Notes: OR, odds ratio; E, experimental group; C, control group. * $p < 0.05$.

necessarily comparable in all respects. Also, both controls and R&R participants had the option of participating in other treatment programmes. Thus, the R&R programme was confounded with other treatment programmes. Also, the follow-up period was not the same for all offenders.

3. *Canadian Federal Offenders*. Male offenders were selected after assessment by staff to determine that they had the targeted cognitive deficits and that they were motivated to participate in the programme (Porporino & Robinson, 1995; Robinson, 1995). The full research sample consisted of 4072 offenders who had been randomly assigned to either the R&R programme ($n=3531$) or the waiting list control group ($n=541$); 14.2% of participants did not complete the R&R programme. The criminal histories of the experimental and control groups were comparable.

Robinson's (1995) study focused on offenders who had been released for at least one year (1673 offenders in the R&R group and 369 offenders in the control group). Recidivism was measured by reconviction and by re-admission to prison for a technical violation. Overall, more controls were reconvicted (24.8%) compared to programme participants (21.3%) and programme completers (19.7%). Only the difference between controls and programme completers was statistically significant.

For low-risk offenders, programme participants and completers were significantly less likely to be reconvicted (Table II). No statistically significant differences were found for high-risk offenders.

The R&R programme was more effective in community settings compared to institutional settings. For community settings, fewer completers (30.5%) and participants (39.7%) were readmitted, compared to controls (50.1%). The differences between participants and controls and between completers and controls were statistically significant. For institutional settings, fewer completers (45.9%) and participants (47.7%) were readmitted, compared to controls (50.1%), but none of these differences was statistically significant.

The R&R programme had the greatest impact on offenders aged between 25 and 39 years old. For offenders under age 25, marginally more participants were readmitted (56.5%) compared to completers (55.1%) and controls (55.4%). Similarly, for offenders above age 40, marginally more completers were readmitted (35.5%) compared to participants (35.3%) and controls (31.3%). In contrast, for offenders between 25 and 39 years old,

more controls were readmitted (51.6%) compared to participants (45.2%) and completers (43%). Only the difference between controls and completers aged 25–39 was statistically significant.

Sex, drug and violent offenders all showed significant improvements. For sex offenders, more controls were readmitted (45.7%) compared to participants (30.2%) and completers (27.7%). For drug offenders, more controls were readmitted (59.3%) compared to participants (43.9%) and completers (42%). For violent offenders, more controls were readmitted (55.6%) compared to participants (47%) and completers (45.3%). No significant improvements were found for non-violent property offenders or robbery offenders.

The R&R programme was more beneficial for non-Aboriginal than for Aboriginal offenders. Aboriginal completers were readmitted at the same rate as controls (57.5%), suggesting no impact of the programme. In contrast, fewer non-Aboriginal participants (45.3%) and completers (42.8%) were readmitted compared to controls (49.1%). The difference between non-Aboriginal controls and completers was statistically significant.

R&R in the USA

4. *Colorado Specialized Drug Offender Programme (SDOP)*. The SDOP is an intensive supervision programme for drug offenders on probation (Mimms, 1995). Johnson and Hunter (1995) evaluated the usefulness of intensive supervision when combined with the R&R programme. Drug offenders were selected for this study if they scored at least five on the nine-point Addiction Severity Index. They were randomly assigned to three conditions: SDOP with R&R ($n=47$), SDOP without R&R ($n=51$), or regular probation ($n=36$). In the interests of disentangling the effect of R&R from the effect of SDOP, SDOP with R&R is compared with SDOP without R&R in Table I.

The outcome measure was revocation of probation and offenders were followed up for eight months (Table II). For probationers with severe drug addictions, SDOP with R&R probationers were least likely to be revoked (18%), compared to SDOP without R&R (43%) or regular probationers (60%). For high-risk probationers, SDOP with R&R probationers were least likely to be revoked (33%), compared to SDOP without R&R (34%) or regular probationers (75%). Johnson and Hunter (1995) did not report the statistical significance of these differences. These results suggest that intensive supervision is more effective than standard probation and that R&R combined with intensive supervision is effective in reducing the number of revocations of offenders with a high drug dependency.

Johnson and Hunter (1995) found an age effect such that SDOP with R&R was less effective for those below age 30. In this case, the revocation probability for SDOP with R&R probationers (42%) was equal to standard probationers (42%), but lower in the SDOP without R&R group (24%). In comparison, the revocation rate for those at least 30 years of age was lower in the SDOP with R&R group (14%) than in the SDOP without R&R (33%) or regular probation groups (42%). The main problem in a study that relies on revocation as the outcome measure is that revocation may be biased by the knowledge of what treatment was received.

5. *Colorado Juvenile Intensive Supervision Probation (JISP)*. Male probationers under JISP were randomly assigned to R&R ($n=20$) or control conditions ($n=20$; Pullen, 1996). Compared to the medium-risk control group, the experimental group was high risk and contained fewer violent offenders.

Recidivism was measured by arrest for a new crime or a technical violation up to six months after termination of JISP (Table II). More programme participants (50%) were rearrested compared to controls (35%) during JISP. The follow-up six months after JISP had ended showed that fewer programme participants (20%) were rearrested compared to controls (25%). Neither of these differences was statistically significant.

Shortcomings of this study include the small sample size and the lack of comparability between the criminal histories of the experimental and control group. The risk of recidivism in the two groups also differed. The fact that the follow-up period was divided into two discrete time periods also raised the problem of when to start measuring recidivism. We chose only to measure arrests in the follow-up period after completion of the R&R programme, but this could give a misleading impression of its effectiveness.

6. Georgia Cognitive Skills Training Programme. The Cognitive Skills Training Programme was introduced at two Youth Detention Centres in Georgia (Murphy & Bauer, 1996; Murphy, Jones & Bauer, 1997). A shortened version of the R&R programme was used (18 sessions) to adapt to the time frame of the juveniles' sentences. Juveniles were selected for the programme if they had committed a violent crime, were between ages 13 and 17, were economically disadvantaged and had a sentence long enough to complete the course. They were randomly assigned to the experimental ($n=175$) or control ($n=56$) groups. Compared to the control group, the experimental group had a higher number of prior arrests and a higher incidence of substance abuse, and thus were of a higher risk level to start with.

Only a small fraction of the original sample (33 participants and 16 controls) who had been released were followed up. Participants were followed up for at least nine months, while controls were followed up for at least 14 months. Recidivism was measured by reconvictions (Table II). The difference between controls and programme participants was statistically significant. However, this difference in recidivism could have been caused (at least in part) by the difference in follow-up periods.

7. California Probation. This evaluation compared the effectiveness of the R&R programme with the Drug Aftercare (DAC) programme for drug offenders on probation, parole or supervised release (Austin, Robinson, Elms & Chan, 1997). The DAC programme required offenders to undergo a minimum number of random urine tests, attend weekly substance abuse counselling sessions and comply with an individualized treatment plan. Male drug offenders who were sentenced to probation or released from prison to community supervision were eligible to participate in the R&R or DAC programme after screening by probation staff. They were randomly assigned to the R&R ($n=71$) or DAC ($n=65$; control) programmes and were followed up for one year. Offenders in both groups had similar demographic characteristics.

Unfortunately, 44.6% of R&R participants and 39.7% of DAC participants dropped out from the study. Rearrest was used as the outcome measure (Table II). Differences between the DAC and R&R participants were not statistically significant. More R&R participants were rearrested for violent offences (34.4% versus 23.1%) and drug-related offences (37.9% versus 7.7%). Conversely, more DAC participants were arrested for non-violent offences (38.5% versus 20.7%). Austin et al. (1997) did not report whether these differences by offence type were statistically significant.

One shortcoming of this study was that the assessment of cognitive skills was only carried out after participants had been assigned to either the R&R or DAC programme. The R&R programme was designed for offenders who lack cognitive skills; hence, this assessment should have been completed before group assignment, so that the R&R programme was only delivered to offenders who could benefit from it.

8. *Georgia, Phase I.* Male parolees were selected if they were identified as “problematic” by their parole officers, had an IQ of 80 and above, and did not have a history of severe substance abuse or sex offences. They were randomly assigned to the experimental ($n = 232$) or control ($n = 236$) groups (van Voorhis et al., 2001). Parolees from both groups had similar criminal histories and demographic characteristics. During the follow-up period, offenders from both groups were given the option of participating in other programmes (e.g. substance abuse, education). More controls participated in such programmes than R&R programme participants.

Recidivism was measured by return to prison or rearrest/revocation. Return to prison data were gathered up to 30 months after programme completion but the outcome measure at 12 months is reported here, because almost all offenders (229 experimentals and 232 controls) were at risk for at least 12 months (Table II). Programme completers were least likely to return to prison (15.8%). Data for rearrests/revocations were available up to nine months after programme completion. Programme completers were least likely to be rearrested/revoked (28.7%). Table II shows that there was a greater treatment effect for high-risk offenders.

One shortcoming of this study was the difficulty of disentangling the treatment effect, since the controls and participants had the option of taking part in other treatment programmes. Hence, the R&R programme was confounded with these other programmes.

9. *Georgia, Phase II.* Male parolees were selected if they had a relatively high risk of reoffending, an IQ of 60 and above, no severe substance abuse and no history of sex offences (van Voorhis et al., 2002). They were randomly assigned to the treatment group ($n = 609$) or control group ($n = 581$). However, 5.7% of the experimental group did not start R&R. Participants were followed up for 33 months, but recidivism data from the 12-month follow-up will be presented here, because many offenders were not at risk for more than 12 months.

Recidivism was based on two measures: return to prison and rearrest/revocation (Table II). Differences between participants and controls on return to prison and rearrest/revocation were not statistically significant, but higher-risk participants did better (Table II).

Further analyses were carried out to determine whether the R&R programme was more beneficial for certain types of offenders. An attrition analysis of participants showed that they were more likely to drop out of the R&R programme if they were middle class, medium to high risk, neurotic and between ages 23 and 27. There were statistically significant interaction effects between prison re-admission and race, age and personality type. White parolees benefited more from the R&R programme: at the 12-month follow-up, fewer white participants had been readmitted (20.7%) compared to white controls (30.2%). Conversely, more non-white participants had been readmitted (27%) compared to non-white controls (24.7%). Offenders between ages 28 and 32 benefited most from the R&R programme: more controls had been readmitted (23.4%) compared to participants (14.7%). Participants below 22 years and above 38 years had higher re-admissions to

prison, but these differences were not statistically significant. Neurotics did not benefit from the R&R programme. Instead, they were significantly more likely to be readmitted to prison: more neurotic participants (34.1%) were readmitted compared to controls (20.4%).

Programme completers were significantly less likely to be readmitted to prison (16.3%) compared to participants who had dropped out for non-criminal reasons (e.g. employment; 25.3%) or controls (24%). Similarly, completers were less likely to be rearrested or reconvicted (24.8%), compared to participants who had dropped out for non-criminal reasons (35.2%) or controls (36%). Those who participated in class, enjoyed the programme, understood the lessons and applied previously taught skills in later sessions were more likely to complete the programme. Increased group cohesion also increased the likelihood of programme completion.

Coaches who were enthusiastic, organized and professional had more completers in their classes. Better coach adherence to the prescribed class structure (e.g. establishing and enforcing rules for missing sessions or for poor classroom behaviour) was significantly related to lower rearrests/revocations. Programme completers were also less likely to recidivate if their coach prepared adequately for lessons and displayed professional detachment (e.g. good coach-offender boundaries).

Class size did not affect programme completion. However, class size affected rearrests/revocations. Offenders in classes of eight or more members were less likely to be rearrested/revoked (22%) compared to those in classes with seven or fewer members (33.7%). Small class sizes may place pressure on the individual to perform, thereby increasing anxiety. Programme completers were more likely to recidivate when they found the skills taught in the programme too difficult, if only a few people did most of the talking, or if they regarded the skills taught as unrealistic.

10. Utah. Programme delivery took place via two-way interactive videoconferencing in this evaluation of the R&R programme (Bench, 2002). All programme participants ($n = 63$) voluntarily participated in the programme while controls ($n = 70$) were either on a waiting list for the programme or were matched to participants on demographic variables.

Arrests (divided into total arrests, misdemeanour arrests, felony arrests, violent arrests, property offences and all criminal activity) after one year was the outcome measure (see Table II). There were no statistically significant differences between participants and controls on all measures of arrests.

R&R in the UK

11. Mid-Glamorgan, Wales (Straight Thinking on Probation – STOP). In this evaluation, R&R programme materials and examples were modified to suit the cultural context. A quasi-experimental design was used. In the first year of the programme, 133 male probationers were given STOP orders. Comparisons with other offenders (e.g. standard probation, community service or custodial sentence) showed that STOP probationers were high-risk, persistent offenders, with STOP being an alternative to a custodial sentence. Thirty-eight per cent of STOP participants did not complete the programme (Lucas, Raynor & Vanstone, 1992).

Reconvictions were measured six, 12 and 24 months after sentence or release from custody (Lucas et al., 1992; Raynor & Vanstone, 1994, 1997). The results reported here have been adjusted for “false positives” (pseudo-reconvictions), which are convictions for

offences committed before the sentence was imposed. After six months, fewer STOP participants were reconvicted (36%) compared to standard probationers (42%; Lucas et al., 1992).

The 12-month follow-up showed that more STOP participants had been reconvicted (44%), compared to STOP completers (35%) and standard probationers (40%). It was considered that the best estimate of the effects of R&R would be obtained by comparing STOP participants (R&R with probation) with regular probation. Fewer STOP participants had been reconvicted compared to offenders who had received custodial sentences (49%). Of those reconvicted, none of the STOP completers received a custodial sentence, compared to 37% of STOP participants and 27% of standard probationers. STOP participants committed slightly less serious offences (18%) compared to offenders who had custodial sentences (21%; Raynor & Vanstone, 1994).

The 24-month follow-up showed that marginally more STOP participants had been reconvicted (65%) compared to STOP completers (63%) and standard probationers (61%). Offenders who had received custodial sentences were reconvicted at the same rate as STOP participants (65%). Two per cent of STOP completers were given custodial sentences on reconviction, compared to 20% of STOP participants and 15% of offenders who had received custodial sentences (Raynor & Vanstone, 1997).

The internal validity of this evaluation was problematic because there was no random assignment to conditions. Selection for STOP was based on probation officer judgements and sentencers could overturn these (Raynor & Vanstone, 1997). It was unclear what factors were considered by sentencers and whether their decisions were based on sound judgement. However, the comparison between predicted and actual reconviction percentages helped to disentangle selection and intervention effects.

12. HM Prison Service (programme delivery between 1992 and 1996). Programme participants volunteered to participate in either the R&R or Enhanced Thinking Skills (ETS) programme ($n=667$) while controls did not participate in any treatment programme ($n=1801$) (Friendship, Blud, Erikson & Travers, 2002; Friendship, Blud, Erikson, Travers, & Thornton, 2003). All offenders were serving custodial sentences of two years or more. Controls were retrospectively matched to programme participants on a reconviction prediction score (three controls matched to each experimental). Ten per cent of programme participants did not complete the treatment.

The ETS programme is based on the same cognitive model as the R&R programme and the same techniques were used. However, the ETS programme had 21 sessions compared to 38 sessions for the R&R programme. Unlike the R&R programme, the ETS programme did not have a critical reasoning module and perspective-taking was taught as a separate module (Blud & Travers, 2001).

Offenders in both groups were divided into four risk categories (low, medium-low, medium-high and high) using the Offender Group Reconviction Scale. Reconviction rates after two years were used as the outcome measure and these were compared within each risk category. For example, the outcomes of low-risk participants were compared with the outcomes of low-risk controls (Table II). Differences between medium-low-risk participants and controls, and medium-high-risk participants and controls, were statistically significant.

One problem with this evaluation was that participants and controls could differ in motivation. Participation was voluntary, implying that programme participants may have had greater motivation to change. Also, the fact that offenders were not randomly assigned to participant or control conditions meant that they could have been different in many ways,

even though they were matched on reconviction prediction scores. Also, it is difficult to disentangle the effect of R&R from the effect of ETS.

13. *HM Prison Service (programme delivery between 1996 and 1998)*. Programme participants volunteered to participate in either the R&R or ETS programme ($n=649$) while controls did not take part in any cognitive skills programme during their custodial sentence ($n=1947$) (Falshaw, Friendship, Travers & Nugent, 2003). All offenders were serving custodial sentences of more than six months. Controls were matched to programme participants on a reconviction prediction score (three controls matched to each experimental). Ten per cent of participants did not complete the programme.

Our aim was to compare the effectiveness of R&R for low- and high-risk offenders. Reconviction rates after two years were used as the outcome measure and these were compared within low and high risk categories (Table II). Since the fraction of participants was 25% in each of four risk categories used by the authors, we collapsed the four categories to two for our analyses. There were no statistically significant differences in reconviction rates between participants and controls.

14. *HM Prison Service (programme delivery between 1998 and 2000)*. Programme participants volunteered to participate in either the R&R or ETS programme (2195 adults, 1534 young offenders; Cann, Falshaw, Nugent & Friendship, 2003). Controls were matched to programme participants on static risk factors and did not participate in any cognitive skills programme during their custodial sentence (2195 adult controls, 1534 young offender controls). All offenders were serving custodial sentences of more than six months. Nine per cent of adults and 14% of young offenders did not complete the programme.

The reconviction rate after one year was used as the outcome measure. Table II shows that there were no statistically significant differences between the reconviction rates of programme participants and controls for either low- or high-risk offenders or for adult or young offenders.

15. *North-west England*. Male juvenile offenders with convictions for violence, sexual or drug-related crime and/or with educational, employment or relationship difficulties were referred to the R&R programme (Mitchell & Palmer, *in press*). Programme participants ($n=31$) voluntarily took part in the programme while controls ($n=31$) were retrospectively matched to participants on static risk factors.

Reconviction and reincarceration rates after 18 months were used as outcome measures (see Table II). There were no statistically significant differences between participants and controls in either reconviction or reincarceration rates.

R&R in Sweden

16. *Berman (in press)*. Male offenders from prisons and probation ($n=276$) voluntarily participated in the programme. Selection for the programme was based on education level, learning capacity, existing mastery of cognitive skills, motivation and interest in the programme. Those with psychopathic characteristics and a very high risk of recidivism were excluded. Controls ($n=451$) were matched to programme participants on criminal characteristics (crime type, sentence length, number of previous adjudications). Twenty-three per cent of programme participants did not complete the programme.

The reconviction rate up to 36 months was the outcome measure (Table II). Differences between programme completers, dropouts and controls, and between controls and dropouts were statistically significant. However, programme participants (including completers and dropouts) did not differ significantly from controls.

Meta-analysis

In order to assess the effectiveness of the R&R programme, a meta-analysis was carried out. A meta-analysis requires a comparable effect size for each study. Each effect size is weighted by the inverse of its variance in order to calculate a weighted mean effect size. This is because evaluations with larger samples or smaller confidence intervals provide better estimates of the overall effect size. A fixed effects meta-analysis was used in most cases, because the effect sizes were not significantly heterogeneous. In the two cases where they were significantly heterogeneous, a random effects model was used.

The odds ratio is used here as the measure of effect size. The odds ratio is mathematically defined as: $OR = (ad)/(bc)$, where a and c are the number of participants in the experimental and control groups respectively who did not reoffend, while b and d are the number of offenders in the experimental and control groups respectively who did reoffend. An odds ratio of greater than 1 indicates a positive treatment effect, while an odds ratio of less than 1 indicates a negative treatment effect. An odds ratio of 1 indicates no relationship between group membership and recidivism and hence no treatment effect. The odds ratio indicates the proportional change in recidivism in the control group compared to the experimental group. Thus, an odds ratio of 1.15 indicates that the reconviction percentage in the control group is 15% higher compared to the experimental group or that the experimental group reoffended 13% less ($1/1.15$) than the control group (Farrington & Welsh, 2002; Lipsey & Wilson, 2001).

The odds ratios in Table II show that R&R programme participants were less likely to reoffend compared to controls in most evaluations. For example, for reconviction/rearrest, 20 odds ratios were greater than 1.0, two were exactly 1.0 and three were less than 1.0. Where investigators provided data for low-risk versus high-risk offenders, these were treated as two separate evaluations. The four risk categories of Friendship et al. (2002) had to be treated as four separate evaluations. Since all ORs were weighted by the inverse of their variance, this did not mean that the results of Friendship et al. had a disproportionately high influence on the overall results.

Pooling the 25 odds ratios based on rearrests or reconvictions, the weighted mean effect size was 1.16 (95% confidence interval = 1.09–1.27; $p < 0.0001$). Thus, there was a 16% increase in recidivism for controls compared to programme participants, or alternatively a 14% decrease in recidivism ($1/1.16$) for programme participants compared to controls. Table III summarizes the key results of the meta-analysis.

The effect size for revocations and violations was close to the chance value of 1.0 and was significantly lower than the effect size for reconvictions ($z = 2.81$, $p < 0.005$). The effect size for return to prison was 1.12 (not significant), and this was also significantly lower than the effect size for reconvictions ($z = 2.56$, $p < 0.010$).

Further analyses were conducted to determine whether the R&R programme was more effective for certain types of offenders or in certain programme settings. First, the effectiveness of the R&R programme when delivered in community versus institutional settings was compared. The weighted mean effect size for R&R programmes conducted in community settings ($n = 11$) was 1.27 ($p < 0.017$), compared with 1.16 ($p < 0.0005$)

Table III. Results of meta-analysis.

Description (<i>n</i>)	Weighted mean odds ratio	Confidence interval	<i>p</i>
Reconvictions (25)	1.16	1.09–1.27	0.0001
Violations (5)	0.99	0.77–1.26	NS
Return to prison (8)	1.12	0.96–1.31	NS
Community settings (11)	1.27	1.04–1.54	0.017
Institutional settings (15)	1.16	1.07–1.26	0.0005
Low-risk offenders (8)	1.28	1.08–1.52	0.005
High-risk offenders (8)	1.12	1.03–1.23	0.011
Canada (4)	1.79	0.91–3.52	0.094
USA (9)	1.21	0.99–1.48	0.056
UK (12)	1.14	1.05–1.25	0.003
Voluntary (16)	1.17	1.08–1.27	0.0001
Non-voluntary (10)	1.20	0.99–1.45	0.057
Small (11)	1.33	1.03–1.73	0.032
Large (15)	1.16	1.08–1.26	0.0001
Pre-2000 (9)	1.47	1.01–2.14	0.042
Post-2000 (17)	1.16	1.07–1.26	0.0002

Note: A random effects model was used for Canada and pre-2000 studies because they were significantly heterogeneous in effect sizes. A fixed effects model was used in all other cases.

in institutional settings ($n = 15$). Thus, in community settings, there was a 27% increase in recidivism for controls compared to programme participants, or conversely a 21% decrease in recidivism for programme participants compared to controls. In institutional settings, there was a 16% increase in recidivism for controls compared to programme participants, or conversely a 14% decrease in recidivism for programme participants compared to controls. Both effect sizes were statistically significant. The effect size in community settings was not significantly greater than the effect size in institutional settings ($z = 0.80$, NS).

Second, the effectiveness of the R&R programme for high- and low-risk offenders was compared. The effect size for R&R programmes for low-risk offenders ($n = 8$) was an odds ratio of 1.28 ($p < 0.005$), compared with 1.12 for high-risk offenders ($n = 8$). Thus, for low-risk offenders, there was a 28% increase in recidivism for controls compared to programme participants, or conversely a 22% decrease in recidivism for programme participants compared to controls. For high-risk offenders, there was a 12% increase in recidivism for controls compared to programme participants, or conversely an 11% decrease in recidivism for programme participants compared to controls. The effect size for low-risk offenders was not significantly greater than the effect size for high-risk offenders ($z = 1.33$, NS).

Third, cross-country comparisons were made. The effect size for R&R programme delivery in Canada ($n = 4$) was an odds ratio of 1.79 ($p < 0.094$); the effect size for R&R programme delivery in the USA ($n = 9$) was an odds ratio of 1.21 ($p < 0.056$); and the effect size for programme delivery in the UK ($n = 12$) was an odds ratio of 1.14 ($p < 0.003$). The smallest weighted mean effect size was the most significant because it was based on the largest number of offenders. Thus there were substantial reductions in offending behaviour by programme participants in all three countries, and between-country differences were not statistically significant.

Fourth, comparisons were made between programmes delivered to volunteers and other programmes. Table III shows that the weighted mean effect size was similar for both types of programmes (voluntary, mean OR = 1.17, $p < 0.0001$; non-voluntary, mean OR = 1.20, $p < 0.057$).

Fifth, comparisons were made between smaller and larger evaluation studies, comparing 11 evaluations with less than 250 persons in total with the other 15 evaluations. Table III shows that the smaller studies had a larger weighted mean effect size (OR = 1.33) than the larger studies (OR = 1.16) but both were statistically significant. The two weighted mean effect sizes were not significantly different ($z = 0.98$, NS).

Sixth, older (pre-2000) evaluations were compared with newer (post-2000) evaluations. The older studies had a larger weighted mean effect size (OR = 1.47) than the newer studies (OR = 1.16), but again both were significant. It should be noted that the older studies tended to be smaller studies. The weighted effect sizes of older and newer studies were not significantly different.

As insufficient evaluations reported recidivism outcome by race or age, meta-analyses could not be carried out for these variables. Some tentative conclusions are drawn here from the available data. The two evaluations that reported recidivism by race (Robinson, 1995; van Voorhis et al., 2002) suggested that white programme participants benefited more from the programme than non-white participants. In Robinson’s (1995) study, there was no treatment effect for Aboriginal offenders (OR = 1.00) but a positive treatment effect for non-Aboriginal offenders (OR = 1.16). In the van Voorhis et al. (2002) study, there was a negative treatment effect for non-white offenders (OR = 0.89) while there was a positive treatment effect for white offenders (OR = 1.66).

Two evaluations (Johnson & Hunter, 1995; Robinson, 1995) reported differences in recidivism by age. In Johnson and Hunter’s (1995) study, there was a negative treatment effect for offenders below age 30 (OR = 0.46) while there was a positive treatment effect for offenders above age 30 (OR = 2.86). In Robinson’s (1995) study, there were negative treatment effects for offenders under age 25 (OR = 0.96) and offenders above age 40 (OR = 0.84), while there were positive treatment effects for offenders between ages 25 and 39 (OR = 1.29). Hence, the R&R programme may work better for participants aged between 30 and 39 years of age, but this needs to be confirmed by future evaluations.

Conclusions

Is the R&R programme effective in reducing recidivism?

Based on reconvictions, our meta-analysis suggests an overall significant 14% decrease in offending by programme participants compared to controls (OR = 1.16). This is smaller than the effect size (weighted mean $r = 0.147$) found in the previous meta-analysis of seven R&R evaluations (Pearson et al., 2002), which they converted to a 26% decrease in recidivism for R&R programme participants compared to controls. However, it is clear that newer studies, based on larger samples, have obtained smaller effect sizes. Overall, the R&R programme seems to be an effective intervention programme.

Does it work better in specific settings?

The meta-analysis suggests that the R&R programme is effective in both institutional and community settings. This is surprising considering that previous meta-analyses (e.g. Izzo & Ross, 1990; Lipsey, 1992) have found better treatment outcomes in community settings.

Friendship, Falshaw and Beech (2003) further suggested that the institutional regime may not be conducive for treatment by imposing too much time in the cell and providing little time for inmates to seek support from other participants or staff. It might be suggested that these results could reflect the fact that most evaluations conducted in institutional settings had voluntary participants, while participants in many of the community evaluations had been compulsorily assigned to the R&R programme as part of a probation or parole order. However, the R&R programme worked equally well with volunteers and non-volunteers.

The R&R programme benefited both low- and high-risk offenders. The effect size was greater with low-risk offenders, possibly because of the greater likelihood of high-risk offenders dropping out of the programme and faring worse than those who had never participated in the programme (Porporino & Robinson, 1995; van Voorhis et al., 2002). It is interesting that the R&R programme was more effective with low-risk offenders, since it was developed for high-risk offenders (Ross & Ross, 1995b).

The R&R programme was followed by a significant reduction in reconvictions and rearrests. However, there were no significant reductions in technical violations, revocations, or in returns to prison. This is surprising, as system bias (probation/parole officers behaving more favourably towards R&R programme participants) should have been greater in violation, revocation and return decisions. This result suggests that the R&R programme caused a real change in offending behaviour.

The R&R programme was equally effective in all three countries where the programme has been evaluated extensively. It is interesting that the R&R programme was effective even when delivered outside its original Canadian context (where it was most effective). Gibbs and Beal (2000) questioned the effectiveness of the R&R programme when implemented in different cultural contexts and highlighted the danger of assuming that the programme is valid because it has proven to be effective in other countries. The weighted mean effect size was smallest but most significant in the UK. The consistency of the weighted mean effect size between 1.16 and 1.21 for US and UK studies, and for large post-2000 studies (with no significant heterogeneity) suggests that this is the best estimate of the effect of R&R on reconvictions at present.

Criticisms of the programme

Despite the effectiveness of the R&R programme in reducing recidivism, it has had critics. As the programme's focus is on thinking skills, it has been criticized for individualizing criminality without taking the offender's social and economic context into account (Gibbs & Beal, 2000; Hannah-Moffatt & Shaw, 2000). Social factors such as drug use, employment, finances and accommodation are important predictors of reconviction after a community sentence, even when criminal history has been controlled (May, 1999). Bhui (1996) suggests that an intermediary stance should be taken where staff recognize the environmental stressors that the offender faces (e.g. poverty) but also highlight the need for offenders to be more adaptive to their circumstances.

Neary (1992) argued that the need for programme integrity can be used against any criticisms of the R&R programme. If an outcome evaluation found that the programme was not effective, the argument that the staff did not uphold programme integrity could be used, thereby placing the blame for an ineffective programme on the staff, and not on the programme content. In order to assess this fairly, programme integrity should be measured before outcomes are known. The need for programme integrity could also transform the R&R programme into a "one size fits all" intervention, where the need for accurate delivery

of programme content is given more importance than a thorough understanding of the skills being taught (Gorman, 1999).

Limitations of the present meta-analysis

One of the strengths of this study lies in its use of both published and unpublished reports. However, programmes that are being evaluated are likely to have better outcomes since there would be closer monitoring of staff and programme delivery as part of the evaluation (Leschied, Bernfeld & Farrington, 2001). Also, most of the evaluations presented here were either carried out by the programme designers (Porporino et al., 1991; Robinson, 1995; Ross et al., 1988), or were funded by a government agency that had a stake in the effectiveness of the programme. Therefore, there could be researcher bias due to the vested interests of the researchers and/or funders.

A shortcoming of the meta-analytic technique is that studies of different methodological quality might be given equal weight (Lipsey & Wilson, 2001). Some of the older and smaller-scale studies were methodologically weak, but they had low weightings in the meta-analysis because of their low sample size. Another way to carry out this study would be to use the Maryland scale of methodological quality as Allen et al. (2002) did (see Sherman et al., 1997 for coding). A major problem is the confounding of the R&R programme with other programmes. Research findings could be weighted by the strength of their methodology to enable conclusions to be drawn about effectiveness whilst taking the methodological strengths and weaknesses of each study into account.

Finally, this meta-analysis used only recidivism to measure the effectiveness of the R&R programme. Reduction in recidivism is the main aim of the R&R programme. Changes in offender thinking styles and attitudes, which are the intermediate outcomes of the programme, were not reviewed.

Improvements to evaluations

The main limitation of many of the evaluations presented here was the low sample size, which led to high variability and non-significant findings (due to large confidence intervals). The strength of meta-analysis is that it can amalgamate many small studies to produce an accurate estimate of effect size (providing that the studies are not significantly heterogeneous). Programme evaluations with better methodological quality and larger samples need to be carried out by independent researchers. Many small-scale evaluations have been carried out demonstrating programme effectiveness. These need to be replicated to assess if the programme can still be effective when implemented on a large scale (Merrington & Stanley, 2000), and on a longer time frame to demonstrate that an effective programme can be sustained (Leschied et al., 2001). Also, evaluations of the R&R programme have mainly used male offenders as their participants. In our meta-analysis, only Johnson and Hunter (1995) clearly included females. Programme evaluations should be designed to assess the effectiveness of the R&R programme with female and non-white offenders as they may respond differently to the programme (Hannah-Moffatt & Shaw, 2000).

Ideally, all evaluations should use randomized controlled trials. It was interesting that these were often used in North American evaluations (as the “gold” standard of evaluation) but never in European ones. It would also be desirable to assess the relative importance of the different elements of the R&R programme. For example, a series of randomized experiments could be carried out, focusing on the effectiveness of one component at a time, followed by combinations of components.

All the evaluations reported here relied on official recidivism data. Programme effectiveness may differ depending on the outcome measure used (Lösel, 1995). The percentage reconvicted is a very insensitive measure; the number and cost of offences of different types would be better. Hence, cost–benefit analyses are important. Multiple recidivism measures such as arrests, reconvictions, and severity of offences (Latessa & Holsinger, 1998) could be used. Official recidivism data may be an insensitive measure because of undetected crime and police and prosecution practices that affect whether criminal proceedings will be instituted (Vennard, Sugg & Hedderman, 1997); hence data on self-reported offending would be useful to complement official recidivism data (Lösel, 1995). This would require follow-up interviews with programme participants and controls.

Offenders in the treatment and control conditions could be matched on their individual risk levels (Andrews et al., 1990; Friendship et al., 2003; Raynor, Kynch, Roberts & Merrington, 2000). Many of the evaluations have used the average risk level of all offenders in the group when making comparisons; for example, a high-risk treatment group may be compared to a medium-risk control group (Pullen, 1996). This leads to misleading comparisons. Better alternatives would be to compare offenders within risk categories (e.g. Friendship et al., 2003), to match pairs of offenders on risk and randomly allocate one member of each pair to the programme, or to report the distribution of risk in the experimental and control groups. Robinson (1995) and van Voorhis et al. (2002) used the last method, basing their statistical analyses first on the average risk of all offenders in the group, before comparing outcomes based on individual risk levels. The kind of treatment that the control condition receives should be specified in detail, because the effect size depends in part on the nature of the control condition.

Overall, the results of our systematic review and meta-analysis are encouraging. Existing evaluations show that the R&R programme is effective in reducing recidivism.

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