

Utah Cost of Crime

**Cognitive-Behavioral Therapy
(Juveniles):
Technical Report**

December 2012



THE UNIVERSITY OF UTAH

Utah Criminal Justice Center

COLLEGE OF SOCIAL WORK
COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES
UTAH COMMISSION ON CRIMINAL AND JUVENILE JUSTICE
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Technical Report

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Increasingly, research indicates that sanctions alone are not an effective means for preventing recidivism of juvenile offenders (Andrews et al., 1990; Bonta, 2001). Henggeler and Schoenwald (2011) suggest that many of the deterrence-oriented interventions used within the juvenile justice system—including intensive supervision, residential placement, transfer to adult court, and shock incarceration—are actually associated with increased delinquent behavior. In contrast, the use of rehabilitative and treatment-oriented interventions has been associated with lower rates of reoffending (Lipsey, Howell, Kelly, Chapman, & Carver, 2011). Cognitive-behavioral therapy (CBT) has emerged as the primary intervention used within juvenile justice settings to reduce recidivism (Milkman & Wanberg, 2007). CBT combines elements from behavior modification and cognitive restructuring theories. When used with delinquent populations, interventions most commonly target criminal thinking patterns, problem-solving behaviors, and coping skills (MacKenzie, 2006).

Within the criminal and juvenile justice systems, CBT has been adapted for a variety of settings and populations: secure- and community-based; adults and juveniles; general, violent, sex, and substance-using offenders; and group and individual formats (Wilson, Bouffard, & MacKenzie, 2005). Treatments are highly structured and can be facilitated by licensed mental health professionals as well as non-clinical staff (Milkman & Wanberg, 2007). While CBT encompasses a heterogeneous set of interventions, six “brand-name” programs were specifically designed for use within criminal and juvenile justice systems: Aggression Replacement Training (ART), Cognitive Interventions Program (CIP), Moral Reconciliation Therapy (MRT), Relapse Prevention Therapy (RPT), Reasoning and Rehabilitation Program (R&R), and Thinking for a Change (T4C). All six programs are manualized and specify treatment targets that have been empirically demonstrated to be related to criminal thinking patterns and behaviors.

Aggression Replacement Training (ART). ART targets offenders’ social skills, anger management, and moral reasoning (Przybylski, 2008). The program is designed to be implemented over a 10-week period, with participants meeting in a group format for three hours per week. ART has demonstrated effectiveness for reducing offending behaviors with juvenile justice populations (Aos et al., 2006).

Cognitive Interventions Program (CIP). CIP is a 15-session intervention developed by the National Institute of Corrections (NIC, 1996). The program targets thinking errors and antisocial attitudes as a means for teaching offenders to make better choices with respect to criminal behavior. Lipsey, Landenberger, and Wilson (2007) found an overall positive effect for CBT programs, including CIP, but did not identify statistically significant differences on recidivism for CIP when compared to other brand-name CBT programs.

Moral Reconciliation Therapy (MRT). MRT is a group-based intervention that targets offenders’ character and personality traits in order to promote positive change that persists after program completion (MacKenzie, 2006). MRT was designed to treat substance abuse issues among criminal justice populations, although the model has been

adapted to issues ranging from sex offending to treatment readiness. MRT focuses on seven primary treatment issues, all of which address clients' beliefs and reasoning. Offender groups are open-ended and can meet weekly or monthly. Results from several meta-analyses demonstrate that MRT is associated with reduced recidivism for adult offenders (Aos et al., 2001; MacKenzie, 2006; Wilson et al., 2005).

Relapse Prevention Therapy (RPT). RPT targets coping skills, self-management, and self-control (Milkman & Wanberg, 2007). Initially developed as a treatment for substance abuse, the program has been expanded to other populations, including sex offenders. This approach views substance abuse, aggression, and violence as habits that can be managed through the development of skills for coping with high-risk situations. Research demonstrates that RPT is effective for reducing substance abuse (Irvin et al., 1999).

Reasoning and Rehabilitation Program (R & R). R & R is a 35-session group-based intervention that targets consequential thinking, criminal thinking patterns, interpersonal skills, and prosocial attitudes (Pryzbylski, 2008). Meta-analyses show that R & R is associated with significant reductions in criminal behavior (Lipsey et al., 2007; MacKenzie, 2006). Lipsey et al. conducted moderator analyses that showed no statistically significant difference between the impact of R & R and other CBT programs on criminal offending.

Thinking for a Change (T4C). T4C, developed by the National Institute for Corrections, incorporates social skills, problem solving, and cognitive restructuring to increase offenders' ability and desire to avoid criminal behavior. T4C is a group-based intervention that covers 25 lessons over 11 weeks, with a recommended 10-session follow-up component. There is limited research on T4C, but the studies that have been conducted demonstrate lower recidivism rates for offenders who participate in T4C (Milkman & Wanberg, 2007).

Prior Research. CBT interventions have been identified as a central component of effective treatment for criminal offenders, including juveniles (Andrews et al., 1990; Aos et al., 2001; Aos et al., 2011; Bonta, 2001; Drake, 2009; Izzo & Ross, 1990; Lipsey, 1995; Losel, 2005). Pearson (2002) analyzed 69 studies comparing behavioral and cognitive-behavioral programs for offenders (including 19 studies of CBT interventions for adolescents) and found that CBT was associated with statistically significant reductions in recidivism while interventions that were primarily behavioral were not associated with significant change. Pearson found no difference in the effectiveness of CBT based on offender age. Wilson's 2005 analysis of 20 studies—which evaluated MRT, R&R, and general cognitive restructuring programs—demonstrated that group-based CBT was associated with significant reductions in recidivism—ranging from eight (8) to 16 percentage points, depending on the program model. The authors did not perform separate analyses based on offender age. Lipsey, Landenberger, and Wilson's (2007) meta-analysis of 58 studies evaluated the six "brand-name" programs and found an overall positive effect (25% reduction in recidivism) with no statistically significant difference between different CBT

programs. Moderator analyses showed that several factors, including treatment fidelity, treatment components, and offender risk, were significantly associated with treatment efficacy. The authors found no relationship between offender age and the impact of treatment on reoffending.

The Washington State Institute for Public Policy has conducted several cost-benefit analyses on programs for juvenile offenders and found that CBT programs, in general, are cost effective in terms of their impact of recidivism (Drake et al., 2009). ART specifically, in both institutional and community settings, had a \$45.50 and \$24.44 respective benefit to cost ratio (Aos et al., 2001; Aos et al., 2011).

Methods

Inclusion Criteria

A systematic review was conducted, in accordance with the protocol outlined by PRISMA (Moher, Liberati, Tetzlaff, & Altman, 2009), to identify studies for inclusion in this meta-analysis. The study authors identified eligibility criteria for population, intervention, setting, outcome, and methodology (see Methods Report for complete description of search strategy). The search was restricted to studies written in English and conducted between 1987 and 2011. Studies had to meet the following criteria to be eligible:

- a) Both the treatment group and the comparison/control group must consist of adolescent offenders (between the ages of 12 and 21 and/or processed by the juvenile justice system). The intervention must target the criminal behavior of general offenders. Studies of specific populations (e.g. sex offenders, mentally ill offenders) were excluded from this study.
- b) The study must evaluate a juvenile justice intervention. Primary prevention programs and programs serving non-court involved populations were excluded. The study must identify the intervention as one of six “brand name” CBT programs: Aggression Replacement Training (ART), Cognitive Interventions Program (CIP), Moral Reconciliation Therapy (MRT), Reasoning and Rehabilitation (R&R), Relapse Prevention Therapy (RPT), or Thinking for a Change (T4C). Studies that identified the intervention as a modified version of one of the above programs were eligible for inclusion. Studies that identified an intervention as CBT, without specifying one of the brand name programs, were not eligible for inclusion.
- c) Interventions conducted in secure- and community-based settings were eligible.
- d) The study must include a post-treatment measure of reoffending—which could be arrest, conviction, return to a secure placement, or delinquency—as an outcome. Recidivism data from official sources was preferred, but studies using only self-report recidivism measures were also eligible. Offenses committed while the offender was in a secure facility were not included; however, recidivism during the time that a participant was on community supervision was included. Non-criminal outcome measures—such as measures of treatment targets—were excluded from this analysis. The study must report quantitative results that could be used to calculate an effect size. Given the interest in recidivism, dichotomous data were preferred (e.g. odds ratios). If the study only included continuous measures, effect

sizes were calculated and converted into odds ratios (Pipsey & Wilson, 2001) using log odds (see Methods Report).

- e) Both experimental and quasi-experimental studies were eligible for inclusion. Quasi-experimental studies had to use matching or statistical methods to demonstrate equivalence between the intervention and comparison group. Treatment dropouts were not considered an appropriate comparison group; comparison groups consisting of offenders who refused treatment were included only if the authors conducted analyses that demonstrated that the groups were similar.

Retrieving and Screening Studies

The initial literature search identified 1,343 abstracts (from 4,108 citations), from which researchers pulled 114 studies for further evaluation. Full articles were screened by the researchers, which resulted in eight (8) studies that met inclusion criteria. Two of those studies included multiple independent comparison groups, which resulted in ten effect sizes that were included in the analysis (see Appendix A). For the remainder of this document, the term study refers to the number of comparisons.

Extracting Data

The research team developed a detailed code sheet and manual, which included variables related to study quality, program characteristics, participant characteristics, and treatment variables (see Methods Report for a full description of coding variables). One researcher coded all of the included studies and entered the data into an Excel spreadsheet. Ten percent (10%) of included studies were double-coded ($k=1$) by a second researcher; discrepancies were resolved through discussion with the research team. To assess study quality, the authors used a modified version of The Maryland Scale of Scientific Rigor (Aos et al., 2001; Gottfredson, MacKenzie, Reuter, & Bushway, 1997). Studies that received a rating lower than three (unmatched comparison group or no comparison group), on a scale of one to five, were excluded. Where studies reported multiple measures of recidivism, researchers selected the broadest measure (e.g. arrest over conviction and conviction over incarceration). Outcome data were collected on general recidivism. Studies were classified as secure-based if the intervention took place in an institutional setting. Studies were classified as community-based if offenders were under court supervision, but not in a secure setting, at the time of treatment. Studies were also coded for the type of CBT program being evaluated.

Analysis

Data were coded into an Excel spreadsheet, which allowed researchers to calculate descriptive statistics for the full sample. The authors then recoded variables, to condense data into comparable units wherein each study contributed only one effect size to each outcome measure, and entered those into *Comprehensive Meta-Analysis* (CMA, version 2). Using CMA, the authors assessed heterogeneity using the Q and I -squared statistics (see Results section). The Q statistic is a test of the null hypothesis: a significant value ($p<.05$) indicates that the variation between studies was greater than one would expect if the difference could be explained entirely by random error (Borenstein, Hedges, Higgins, & Rothstein, 2009). Because the Q statistic is not a precise measure of the magnitude of

dispersion between studies, the authors conducted additional analyses to quantify the proportion of variance that could be attributed to differences in study characteristics (such as setting, population, and intervention). The I-squared statistic (values range from 0% to 100%) provides an estimate of how much of the variation between studies can be explained by random error: values near 0 indicate that all of the difference can be explained by random error. Values at 25%, 50% and 75% are, respectively, considered low, moderate, and large heterogeneity (Piquero & Weisburd, 2010). Given the range of study characteristics present in this sample, a random effects model, which assumes variability between studies (Piquero & Weisburd, 2010), was used to generate a summary effect size for each outcome measure. All data was coded and transformed into odds ratios, with values above 1 indicating a negative treatment effect and values below 1 indicating a positive treatment effect (i.e., reduced recidivism rates for offenders who participated in treatment).

Results

Sample Characteristics

Five (5) of the studies were conducted in the United States (see Table 1). Half of the studies (k=5) were evaluations of ART, three (3) evaluated R&R, and two (2) were of MRT. No eligible studies evaluating CIP or T4C were located. Half of the studies evaluated interventions conducted in a secure setting and the other half were conducted in a community-based setting. The follow-up period ranged from six months to 20 years. Total sample size ranged from 40 to 3,068 and the entire sample describes 2,555 offenders in treatment groups and 2,456 offenders in comparison groups.

Table 1 Characteristics of studies included in meta-analysis (k=10)

Characteristics	Frequency	%
Publication type		
Peer-reviewed journal	5	50
Unpublished technical report	2	20
Book	3	30
Sample location		
U.S.	8	80
Canada	--	--
Other	2	20
Methodological Quality		
5: Random Control Trial (RCT)	2	20
4: High quality quasi-experimental ¹	6	60
3: Quasi-experimental with testing or matching	2	20
Dropouts enumerated	8	80

¹Employs a quasi-experimental research design with a program and matched comparison group, controlling with instrumental variables or Heckman approach to modeling self-selection; May also include RCT with problems in implementation.

Meta-analysis

General recidivism was examined in 10 studies. In eight (8) of those, results favored treatment (two (2) were significant at $p < 0.05$). The odds-ratios for general recidivism ranged from 0.23 to 1.20 (see Appendix B). The random effects mean odds-ratio was 0.85 (95% CI of 0.72 to 1.00, $p = .05$), indicating that the treatment groups had lower rates of general recidivism than the comparison groups and the results approached significance (see Appendix C). The Q test for heterogeneity was not significant ($Q = 10.64$, $df = 9$, $p < 0.30$, $I^2 = 15.40$) which means that statistically the studies share a common effect size.

General recidivism by setting. Five studies examined recidivism following secure-based treatment, of which four showed results that favored treatment (none significant at $p < 0.05$). The random effects mean odds-ratio was 0.90 (95% CI 0.78 to 1.04, $p = 0.14$), which indicates no significant differences in recidivism for the treatment and comparison groups.

Five (5) studies examined recidivism during and following community-based treatment and four (4) showed results that favored the treatment group (two (2) were significant at $p < 0.05$). The random effects mean odds-ratio was 0.66 (95% CI 0.39 to 1.11, $p < 0.12$) indicating no significant differences in recidivism as a result of treatment. The between-groups Q test was not significant ($Q = 1.30$, $df = 1$, $p = 0.26$), which indicates that there was no statistically significant difference in recidivism rates based on program setting.

General recidivism by program type. The ART program had the largest number of studies ($k = 5$), all of which showed results that favored the treatment group. The mean effects odds-ratio for ART was 0.48 (95% CI 0.25, 0.93, $p < 0.05$), which indicates a significant, positive effect of treatment on recidivism. The R&R program was evaluated in three (3) studies, two (2) of which favored the treatment group. The random effects mean odds-ratio was 0.92, 95% CI 0.80 to 1.07 $p = 0.28$, which means there appears to be a small positive treatment effect but this effect is not statistically significant. MRT was evaluated in two (2) studies, one (1) of which favored the treatment group. None of the results for MRT were statistically significant. Despite the apparent differences in the effectiveness of different CBT program, the between-groups Q test was not significant ($Q = 3.55$, $df = 2$, $p = 0.17$), which indicates that although there are small differences in treatment effects between ART, R&R, and MRT these programs have statistically similar effects on recidivism.

Limitations

The strength of a meta-analysis rests on the comprehensiveness of the search strategy. While the authors sought to identify all eligible studies, the possibility exists, and is in fact likely, that those efforts failed to identify all the extant research on CBT interventions for juvenile offenders. In some cases, the researchers were unable to obtain studies that were identified as eligible evaluations. Further, the strength of a meta-analysis is dependent on the quantity and quality of the available primary research. Six of the studies included in this analysis were RCTs wherein the authors note significant problems with randomization. Pullen (1996) attributed the increased recidivism rates for treated offenders to

documented problems with treatment implementation and treatment fidelity. Finally, the studies included here reflect significant heterogeneity in terms of offenders, setting, dosage, study quality, and outcome measures. In many cases, the study authors did not provide sufficient information to allow for moderator analyses of relationship between those characteristics and treatment effect. Further, the relatively small sample of included studies made it difficult to conduct moderator analyses where sufficient information was available.

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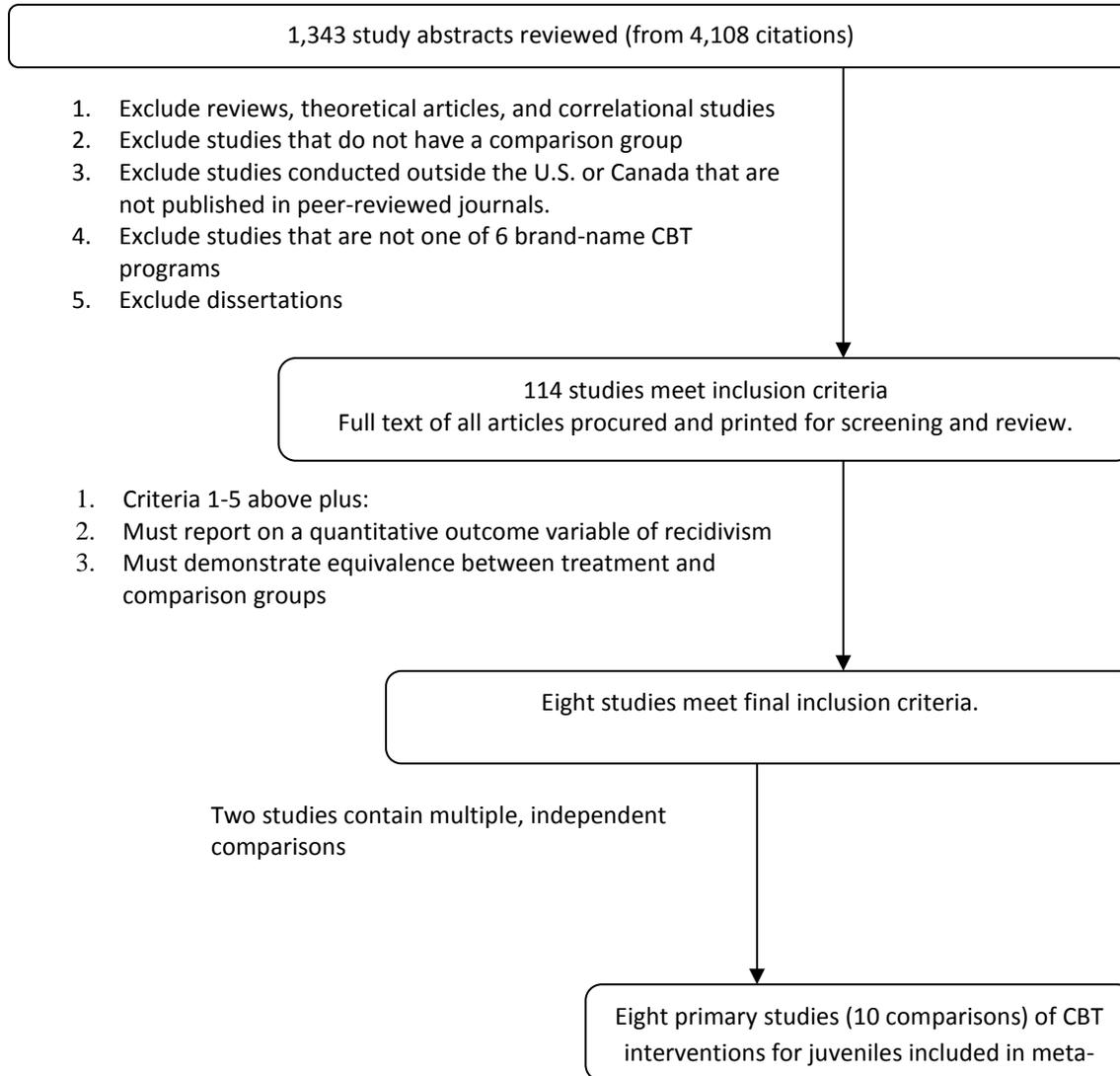
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APPENDIX A: Search Results

Search: Title and Abstract
Search Limiters: Date Range
(1987-2011), English



Appendix B: Included Studies

Author	Date	N in Each Group		Study Design	Intervention		General Recidivism	
		Treatment	Control		Type	Compared to	Odds Ratio	95% CI
Armstrong	2003a	110	102	Random	MRT	None	0.99	0.56, 1.74
Armstrong	2003b	65	102	Random	MRT	None	0.72	0.38, 1.36
Barnoski	2004	704	525	Convenience	ART	Other Tx	0.89	0.71, 1.11
Cann et al.	2006	1534	1534	Matching	R&R	None	0.92	0.79, 1.07
Goldstein et al.	1989a	13	32	Random	ART	None	0.23	0.04, 1.25
Goldstein et al.	1989b	20	32	Random	ART	None	0.57	0.17, 1.86
Goldstein et al.	1994	38	41	Random	ART	None	0.29	0.09, 0.91
Leeman et al.	1993	20	37	Random	ART	None	0.26	0.06, 1.04
Mitchell et al.	2004	31	31	Convenience	R&R	None	0.83	0.23, 3.03
Pullen	1996	20	20	Random	R&R	None	1.20	0.36, 4.00
Total Sample =5,011								