

Utah Cost of Crime

**Cognitive-Behavioral Therapy
(Adults):
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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**Cognitive-Behavioral Therapy for Adult Offenders:
Technical Report**

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Increasingly, research indicates that criminal sanctions alone are not an effective means for preventing reoffending (Andrews et al., 1990; Bonta, 2001). Treatment modalities, however, are differentially effective with criminal justice populations (Lipton, Martinson, & Wilks, 1975; MacKenzie, 2006; Pearson, Lipton, Cleland, & Lee, 2002). Cognitive-behavioral therapy (CBT) has emerged as the primary intervention used within correctional settings to change criminal behaviors (Milkman & Wanberg, 2007). CBT combines elements from behavior modification and cognitive restructuring theories. When used with offender populations, interventions most commonly target criminal thinking patterns, problem-solving behaviors, and coping skills (MacKenzie, 2006). Within the criminal justice system, 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 with offenders: 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). The program has only recently been adapted for use in adult correctional settings.

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 empirically identified as a central component of effective treatment for criminal offenders (Andrews et al., 1990; Bonta, 2001; Losel, 2005). Pearson (2002) analyzed 69 studies comparing behavioral and cognitive-behavioral programs for offenders and found that CBT was associated with statistically significant reductions in recidivism while interventions that were primarily behavioral were not associated with significant change. 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 to 16 percentage points, depending on the program model. Wilson et al. (2005) identified significant heterogeneity between studies in terms of offenders, setting, and treatment components. Lipsey, Landenberger, and Wilson (2007) examined the association between specific and CBT program efficacy. Their 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. Specifically, higher risk offenders, offenders who received anger management or interpersonal problem solving training, and offenders who received treatment in well-implemented programs showed larger treatment effects. In an analysis of 36 effect sizes, the Washington State Institute for Public Policy found both prison- and community-based CBT programs for adults were cost

effective in terms of recidivism, with \$49.55 and \$37.50 benefit to cost ratio respectively (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 adult offenders (ages 18 years and older). 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 criminal 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 Recondition 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 recidivism—which could be arrest, conviction, or incarceration—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 35 studies that met inclusion criteria. Nine of the included studies reported results on duplicate samples and were therefore excluded. Three of the remaining 26 studies included multiple independent comparison groups, which resulted in 29 effect sizes that were included in the analysis (see Appendix A). For the remainder of this document, the term studies 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 ($k=3$) by a second researcher; discrepancies were resolved through discussion. 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 prison, jail, or psychiatric hospital. Studies were classified as community-based if offenders were on probation or parole at the time of treatment. Community-based programming that was provided as a planned aftercare component of secure programming was classified as secure-based treatment. Community-based programming that was unrelated to prison- or jail-based interventions was coded as community-based, even if the offenders had participated in treatment during incarceration. Studies were also coded for the type of CBT program being evaluated.

Several studies conducted post-hoc analyses based on offender risk level (Bonta et al., 2000; Polaschek, 2011). Results from those analyses were included in the meta-analysis only when the authors demonstrated equivalence between sub-groups of the sample (for instance, Polaschek constructed the comparison group using 1:1 matching and the analysis of high-risk offenders paired high-risk offenders with a matched pair). If there was no evidence of equivalence between offenders in the high-risk sub-group, the study was coded using the entire sample as defined at the beginning of the study.

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; Sedgwick, 2012). 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

The majority of studies (*k*=12) were conducted in the United States. Four studies received a score of five out of five on study quality and the remaining studies received a three or a four. The majority of studies (21) were evaluations of R&R, three evaluated RPT, two were of MRT, two of T4C, and one evaluated ART. No eligible studies evaluating CIP were located. Twelve of the studies evaluated interventions conducted in a secure setting and 17 studies evaluated interventions conducted in a community-based setting. The community-based treatment samples included 11 studies of probationers, four studies of parolees, and two studies of mixed groups. The follow-up period ranged from six months to twenty years. Total sample size ranged from 20 to 3,701 and the entire sample describes 10,945 offenders in treatment groups and 12,491 offenders in comparison groups.

Table 1 Characteristics of studies included in meta-analysis (*k*=29)

Characteristics	Frequency	%
Publication type		
Peer-reviewed journal	18	63
Unpublished technical report	5	17
Book	6	21
Sample location		
U.S.	12	41
Canada	5	17
Other	12	41
Methodological Quality		
5: Random Control Trial (RCT)	4	14
4: High quality quasi-experimental ¹	8	(27)
3: Quasi-experimental with testing or matching	17	59

Characteristics	Frequency	%
Dropouts enumerated	17	59

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 29 studies. In 21 of those, results favored treatment (ten were significant at $p < 0.05$). The odds-ratios for sexual recidivism ranged from 0.03 to 2.19 (see Appendix B). This finding was expected given the range of offenders, interventions, and treatment types included in the meta-analysis. The random effects mean odds-ratio was 0.70 (95% CI of 0.58 to 0.85, $p < 0.01$), indicating that the treatment groups had significantly lower rates of sexual recidivism than the comparison groups (see Appendix C). The Q test was significant ($Q = 146.78$, $df = 28$, $p < 0.01$) and the I-squared statistic ($I^2 = 80.92$) indicated that a large amount of the variance can be attributed to study-level differences.

General recidivism by setting. Twelve studies examined recidivism following prison- or secure-based treatment, of which nine showed results that favored treatment (five significant at $p < 0.05$). The random effects mean odds-ratio was 0.63 (95% CI 0.47 to 0.84, $p < 0.01$), indicating a significant reduction in recidivism for the treatment group. The Q test was significant ($p < 0.01$).

Seventeen studies examined recidivism during and following community-based treatment and 12 showed results that favored the treatment group (five were significant at $p < 0.05$). The random effects mean odds-ratio was 0.75 (95% CI 0.57 to 0.98, $p < 0.05$) indicating a significant reduction in recidivism for the treatment group. The Q test was significant ($p < 0.01$). When looking at the effects of treatment according to offender type, for community-based treatment, only the probationers showed statistically significant reductions in recidivism (mean odds-ratio 0.58, 95% CI 0.44, 0.76, $p < 0.05$). Both the parole and mixed samples demonstrated non-significant effects.

Despite these apparent differences in effect sizes when comparing secure- to community-based CBT programs, the between groups Q test was not significant ($Q = 0.70$, $df = 1$, $p = 0.40$), which indicates that although the effects of CBT in secure settings are stronger than the effects in community-based settings, these differences are not statistically significant.

General recidivism by program type. The R&R program had the largest number of studies ($k = 21$). The mean effects odds-ratio was 0.75 (95% CI 0.60, 0.93, $p < 0.01$), which shows a significant, positive effect of treatment on recidivism. T4C (mean odds-ratio 0.56, 95% CI 0.34, 0.91, $p < 0.05$) and MRT (mean odds-ratio 0.38, 95% CI 0.28, 0.51, $p < 0.01$) also demonstrated statistically significant reductions in recidivism for the treatment group. Neither ART (1 comparison) or RPT (3 comparisons) was associated with statistically significant effects; however, the small sample size for each of those program types makes it impossible to make conclusions about either program. In contrast with other studies

(Wilson et al., 2007), the between groups Q test indicated significant differences in effectiveness based on program type ($p < 0.01$).

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. 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. Overall, this sample contains few randomized studies and a high proportion of relatively weaker study designs, which may inflate the overall effect of treatment on recidivism. 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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Included Studies

Note: The studies marked with an asterisk (*) were included in the analyses. Studies without an asterisk are eligible but statistically dependent.

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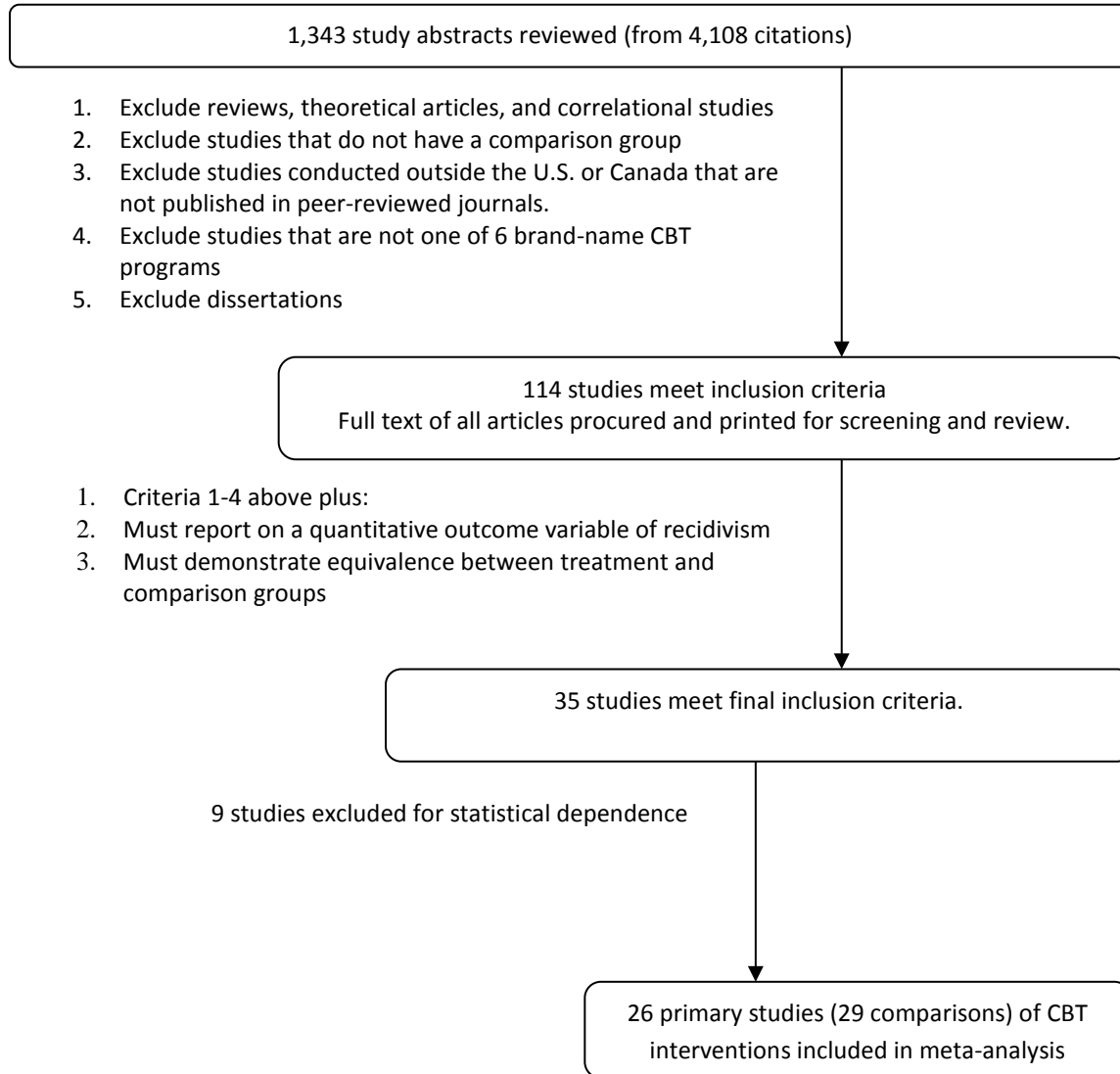
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APPENDIX A: Search Results

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
Austin et al.	1999	71	65	Random	R&R	Other Tx	0.78	0.37, 1.67
Berman	2004	276	431	Matching	R&R	None	0.77	0.57, 1.05
Bonta et al.	2000	54	100	Convenience	RPT	None	1.05	0.51, 2.13
Falshaw et al.	2004	649	1947	Matching	R&R	None	1.01	0.84, 1.21
Friendship et al.	2003	667	1801	Matching	R&R	None	0.45	0.29, 0.70
Golden	2006	60	60	Matching	T4C	None	0.71	0.24, 1.83
Hatcher et al.	2008	53	53	Matching	ART	None	0.62	0.29, 1.34
Hollin et al.	2008	2186	2749	Convenience	R&R	None	0.43	0.35, 0.53
Johnson & Hunter	1995	47	51	Random	R&R	None	0.82	0.34, 2.00
Khodayarifard et al.	2010	94	40	Random	R&R	None	0.03	0.00, .051
Kownacki	1995	10	10	Random	R&R	None	0.17	0.02, 1.88
Little et al.	1999	115	65	Convenience	MRT	None	0.50	0.27, 0.93
Little et al.	2010	1052	329	Convenience	MRT	None	0.34	0.25, 0.47
Lowenkamp et al.	2009	121	96	Convenience	T4C	None	0.52	0.29, 0.91
Martin & Hernandez	2010	55	50	Convenience	R&R	None	0.44	0.19, 0.99
Miller & Miller	2011	160	143	Convenience	RPT	Other Tx	1.01	0.46, 2.25
Palmer & McGuire	2007	1311	2390	Convenience	R&R	None	0.52	0.45, 0.62
Polaschek	2011	84	84	Matching	RPT	None	0.46	0.16, 1.31
Porporino & Robinson	1995	550	207	Random	R&R	None	1.08	0.69, 1.71
Raynor & Vanstone	1996	107	164	Convenience	R&R	None	1.20	0.71, 2.03
Robinson	1995	1746	379	Random	R&R	None	0.80	0.62, 1.03
Robinson & Grossman	1991	40	23	Matching	R&R	None	0.57	0.18, 1.86
Ross & Fabiano	1988a	22	23	Convenience	R&R	None	0.09	0.02, 0.38
Ross & Fabiano	1988b	22	23	Convenience	R&R	Other Tx	0.24	0.06, 0.93
Van Voorhis et al.	2002	459	483	Random	R&R	None	0.87	0.68, 1.13
Van Voorhis et al.	2004	232	236	Random	R&R	None	0.86	0.59, 1.25
Wilkinson	2005	105	98	Convenience	R&R	None	1.00	0.55, 1.80
Wilson & Zozula	2011a	345	113	Random	R&R	None	2.19	1.41, 3.41
Wilson & Zozula	2011b	345	278	Random	R&R	Other Tx	1.22	0.89, 1.68

Total Sample = 23,436