Potential Mediators of Cognitive–Behavioral Therapy for Adolescents With Comorbid Major Depression and Conduct Disorder

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Several possible mediators of a group cognitive–behavioral therapy (CBT) for depressed adolescents were examined. Six measures specific to CBT (e.g., negative cognitions, engagement in pleasurable activities) and 2 nonspecific measures (therapeutic alliance, group cohesion) were examined in 93 adolescents with comorbid major depressive disorder and conduct disorder who were randomly assigned to the Adolescent Coping With Depression (CWD-A) course or a life skills control condition. Change on the Automatic Thoughts Questionnaire (S. D. Hollon & P. C. Kendall, 1980) appeared to mediate treatment effects on depressive symptoms. Therapeutic alliance by the 3rd session was higher among the CWD-A participants but did not predict reductions in depressive symptoms. Findings suggest that reducing negative thinking may be the primary mechanism through which the CWD-A intervention reduces depression.

Of the psychosocial treatments for major depressive disorder (MDD) in adolescents, cognitive–behavioral therapy (CBT) has received the most attention and empirical support (e.g., Curry, 2001; Kaslow & Thompson, 1998; Reinecke, Ryan, & DeBois, 1998). The Adolescent Coping With Depression (CWD-A) course (Clarke, Lewinsohn, & Hops, 1990), a Group CBT treatment, has been evaluated most extensively (Clarke, Rohde, Lewinsohn, Hops, & Seeley, 1999; Lewinsohn, Clarke, Hops, & Andrews, 1990) and has been classified as probably efficacious (Kaslow & Thompson, 1998). This support, however, is based on highly controlled efficacy trials with relatively homogeneous samples, the results of which may not be applicable to clients in real-world practice settings (Schoenwald & Hoagwood, 2001).

Given the gap between effectiveness outcomes in research-versus clinic-based treatment studies (e.g., Weisz, Weiss, & Donenberg, 1992), there is a growing recognition for the need to enhance the external validity of randomized clinical trials (e.g., Howard, Moras, Brill, Martinovich, & Lutz, 1996). An important factor in increasing the external validity is the use of more clinically representative samples, which is tantamount to studying depressed adolescents with significant psychiatric comorbidity (Rohde, Lewinsohn, & Seeley, 1991). Toward this end, Rohde, Clarke, Mace, Jorgensen, and Seeley (2004) recently conducted a randomized controlled trial that combined aspects of efficacy and effectiveness research. Specifically, adolescents with comorbid MDD and conduct disorder (CD) were referred from a juvenile justice setting and randomly assigned to either the CWD-A course or to a life skills (LS)-tutoring nonspecific control treatment condition. Participants were permitted to initiate or continue concomitant (nonresearch) adjunctive mental health treatment services during the study. MDD recovery rates at the end of acute treatment were significantly greater in CWD-A compared with LS (39% vs. 19%). CWD-A participants also reported greater reductions in depression symptoms by termination, as measured by the Beck Depression Inventory—II (BDI–II; Beck, Steer, & Brown, 1996) and the Hamilton Depression Rating Scale (HDRS; Hamilton, 1960). Treatment group differences in MDD recovery rates at 6-month follow-up (54% and 60%, respectively) and at 12-month follow-up (63% in each condition) were nonsignificant, however, as were differences in CD recovery rates both at posttreatment (9% in CWD-A, 17% in LS) and during follow-up (e.g., 42% and 39%, respectively, at 12-month follow-up). Although we had hoped that treatment effects would persist through follow-up, to our knowledge, no randomized controlled trial in which CBT has been compared with an alternative control condition has found significant treatment group differences beyond the acute phase of treatment.

Given that the CWD-A intervention appears to be an effective acute treatment for depression in adolescents with comorbid CD, the next step is to test the hypothesis that changes in cognitive and behavioral skills that are taught in the intervention mediate the effects of the treatment on changes in depressive symptoms. We focused on the following CBT-specific variables: improved social skills, increased engagement in pleasant activities, the use of relaxation techniques, identification of negative–irrational thoughts and the creation of positive counterthoughts, and improved problem-solving–conflict-resolution skills.

An evaluation of the mediators that putatively account for intervention effects in randomized trials is an important, but understudied, topic (e.g., Hinshaw, 2002; Kazdin & Nock, 2003; Kazdin & Weisz, 1998; Lochman, 2001; Weersing & Weisz, 2002). Such mediational analyses are important for several reasons (Coie et al., 1993). First, these analyses provide a test of the theoretical mechanisms that putatively underlie intervention effects. If intervention effects are observed in the absence of changes in the putative mediators, then the theory underlying the intervention would appear to be incorrectly specified. Similarly, a funda-
mental problem with the intervention theory would be present if the intervention results in changes on the proposed mediator but does not reduce depression. Mediation analyses may also help elucidate which intervention components are the most important in effecting a reduction in depression, which might promote revision of the intervention to amplify these more active components and downplay or eliminate the less active elements.

There is emergent discussion regarding how best to test for possible mediators of treatment effects (e.g., Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001; Kraemer, Wilson, Fairburn, & Agras, 2002). One approach consists of four steps that follow the traditional requirements for testing mediation (Baron & Kenny, 1986; see Figure 1). First, treatment condition should predict change in the outcome (Path C). Second, treatment condition should predict change in the putative mediator (Path A). Third, change in the mediator should be significantly associated with change in the outcome (Path B). Fourth, the effect of treatment condition on change in the outcome should be attenuated when change in the mediator is statistically controlled (Path C').

Almost no clinical trials in adolescent psychopathology have investigated potential mediators of treatment effects. In their recent review of psychosocial interventions for youths, Weersing and Weisz (2002) concluded that although 42 of the 67 reviewed studies included measures of potential mediating variables, only 6 formally tested for mediation, and of these, only 1 (Kolko, Brent, Baugher, Bridge, & Birmaher, 2000) focused on adolescent depression. Kolko et al. (2000) were able to show treatment specificity—that is, reductions in a measure of cognitive distortions for participants in the CBT group—but were unable to formally demonstrate that these differences mediated treatment effects because differences in depression reductions across the three treatment conditions were nonsignificant (which is the first condition of a mediational model; Path C in Figure 1).

Identifying mediators of treatment effects for CBT interventions with depressed adults has generally been unsuccessful (e.g., Hol- lon, DeRubeis, & Evans, 1987), although Teasdale et al. (2001) found that an absolutistic, dichotomous response style of processing depression material appeared to mediate the relapse prevention effect of treatment. In depression prevention research, changes in depressotypic cognitions appear to mediate changes in depression symptom levels in fifth and sixth grade students (Gillham, Reivich, Jaycox, & Seligman, 1995), university students (Seligman, Schulman, DeRubeis, & Hollon, 1999), and adults at elevated risk for depression (Allart-van Dam, Hosman, Hoogduin, & Schaap, 2003; Muñoz et al., 1995).

Although the need to identify specific therapeutic factors by testing for mediated treatment effects has been repeatedly emphasized, others assert that treatments are often equal to one another in their ability to impart therapeutic effects because of common or nonspecific factors (Luborsky et al., 2002; Strupp & Hadley, 1979). Such nonspecific factors include, for example, therapeutic working alliance and placebo—expectancy effects. One possibility is that nonspecific factors reduce hopelessness and other negative cognitions (Iardi & Craighead, 1994). Although the interplay among these variables is not entirely clear, it is often found that nonspecific therapeutic factors explain treatment effects with adults (Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000), as well as with children and adolescents (Shirk & Karver, 2003). In contrast, research with depressed adults suggests that specific and nonspecific factors in CBT treatment can be differentiated (DeRubeis, Hollon, Evans, & Bemis, 1982) and that CBT has therapeutic effects beyond the contribution of nonspecific factors (Oei & Shuttlewood, 1996; Thase et al., 2000). Comparable studies examining the impact of specific and nonspecific factors with depressed adolescents have not been previously conducted. We therefore tested the hypothesis that nonspecific therapy factors—perceived group cohesion and therapeutic alliance—would mediate CWD-A intervention effects.

To summarize, we tested whether six CBT-specific measures and two nonspecific therapeutic measures would account for depression-reducing effects of the CWD-A intervention, compared with a nonspecific treatment control group. CBT-specific measures consisted of adolescent report of the following: effective use of social skills, frequency of engagement in pleasant activities, effective use of relaxation skills, frequency and magnitude of negative thoughts, frequency and magnitude of dysfunctional attitudes, and effective use of problem-solving—conflict-resolution skills. The nonspecific measures included adolescent report of therapeutic alliance and group cohesion obtained at the third group session. Adolescents with comorbid MDD and CD were randomly assigned to either the CWD-A course or a LS—tutoring control condition. All participants were assessed on the putative CBT mediators and on two dimensional measures of depression prior to and at the conclusion of acute treatment. Mediational effects were evaluated with the steps outlined by Baron and Kenny (1986).

Method

Procedures

Between 1998–2001, adolescents age 13–17 years were referred to the study by staff within the Department of Youth Services of Lane County, Oregon. Referred adolescents were under the supervision of a Department of Youth Services officer but were not incarcerated when they entered the study. They were referred to this project because the juvenile corrections staff believed that they might be suffering from depression. Consent was obtained from adolescents and their legal guardians. All procedures were approved by the research center’s internal review board, and no adverse events associated with study participation were found.

Adolescents and a parent or knowledgeable adult informant completed assessments at intake for past and current episodes of psychiatric disorders.
in the adolescent with the Schedule for Affective Disorder and Schizophrenia for School Age Children—Epidemiologic Version 5 (K–SADS–E-5, Orvaschel, 1994), a semistructured interview designed to assess Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM–IV; American Psychiatric Association, 1994) psychopathology. Follow-up diagnostic interviews consisted of a joint administration of the Longitudinal Interval Follow-up Evaluation (Keller et al., 1987) along with the K–SADS–E-5, both adapted to probe for continuing or new psychiatric episodes since the last interview. Diagnostic interviewers had bachelor’s or master’s degrees in psychology or social work, completed extensive training, and were regularly supervised. Interviewers were blind to the participants’ conditions. All diagnostic interviews were audiotaped, and 10% were randomly selected and independently rated by experienced diagnostic interviewers. Interrater agreement rates for MDD and CD were excellent, with kappas of .88 and 1.00, respectively.

Inclusion criteria in the study were as follows: (a) 13–17 years of age, (b) current DMS–IV MDD, (c) current DSM–IV CD, (d) expected residence in Lane County for the next 12 months, and (e) the ability to converse in English. Exclusion criteria were deliberately minimal: (a) charges of first degree assault, robbery, homicide, or rape and (b) current and acute psychotic symptoms. Adolescents meeting these criteria were randomly assigned to either the CWD-A intervention. Measures were selected on the basis of (a) applicability to participants in both treatment conditions and (b) simplicity, given that reading and concentration limitations were present for some participants.

Cognitions. Depressotypic thoughts were assessed with two measures. Participants completed the 30-item Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980), which assesses the frequency of occurrence of negative thoughts (e.g., “I’m no good.” “My life is a mess.”) over the past week on a 5-point scale (α = .98, range = 30–145 on a scale that went from 30–150). Participants also completed nine items previously selected (Andrews, Lewinsohn, Hops, & Roberts, 1993) from the Dysfunctional Attitude Scale (DAS; Weissman & Beck, 1978), which assesses the degree of agreement (5-point scale) with attitudes or beliefs sometimes held by depressed individuals (α = .80, range = 9–42 on a scale that went from 9–45).

Relaxation. Four items measuring relaxation (Relaxation) were selected from the Pleasant Events Schedule (PES; MacPhillamy & Lewinsohn, 1982) on the basis of face validity: “being relaxed,” “thinking about something good in the future,” “having peace and quiet,” and “sleeping soundly at night.” Summed cross-product scores were computed with past-month engagement in the relaxing activity (0 = never, 1 = 1–6 times, 2 = 7 or more times) and the rating of how fun the activity was (0 = not fun, 1 = somewhat fun, 2 = very fun; α = .77, range = 0–16 on a 16-point scale).

Social skills. Another seven face-valid items from the PES were used to measure participation in activities requiring the use of Social Skills (“meeting someone new of the same sex,” “having a frank and open conversation,” “having a lively talk or discussion,” “being popular in a group,” “complimenting or praising someone,” “having people show interest in what I’ve said,” and “meeting someone new of the same or opposite sex”). Scoring for the Social Skills scale (α = .75, range = 0–28 on a 28-point scale) was identical to the Relaxation measure.

Problem solving. Adolescents completed 18 potential conflict events from the Issues Checklist (Robin & Weiss, 1980), a measure of the number of parent–adolescent conflicts during the past 2 weeks and the average intensity of discussions regarding these issues (5-point scale ranging from 1 (calm to 5 = angry)). These items were selected on the basis of their use in a previous study of purely depressed community adolescents (Clarke et al., 1999). A mean intensity rating for parent–adolescent discussions within a 2-week period was computed that served as a proxy measure of problem-solving–conflict-resolution skills (α = .87, range = 1.0–3.2 on a 5-point scale).

Assessment of Dimensional Outcomes

Two dimensional measures of depression symptoms were examined: (a) adolescents completed the BDI–II (Beck et al., 1996), a 21-item self-report measure of depressive symptomatology, during the past week (intake α = .93, range = 0–50 on a 64-point scale), and (b) interviewers completed a 19-item version of the HDRS (Hamilton, 1960; α = .77, range = 3–29 on a 79-point scale).

Assessment of Specific Therapeutic Factors

In addition to assessing changes in psychiatric status, participants completed questionnaires that assessed factors hypothesized to be relevant to the CWD-A intervention. Measures were selected on the basis of (a) applicability to participants in both treatment conditions and (b) simplicity, given that reading and concentration limitations were present for some participants.

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Assessment of Nonspecific Therapeutic Factors

Working alliance. The adolescent’s perception of working alliance with the therapist was assessed at the third session with a 12-item version of the Working Alliance Inventory (WAI; Horvath & Greenberg, 1989). Items (e.g., “I am confident in my instructors’ ability to help me.” “My instructors and I trust one another.”) were rated on a 7-point scale of agreement (α = .89, range = 20–81 on a scale that went from 12–84).

Group cohesion. The adolescent’s perception of group cohesiveness was measured at the third session with 14 items from the Group Cohesiveness Questionnaire (Lieberman, Yalom, & Miles, 1973). Items were rated on a 5-point scale of agreement (α = .89, range = 3–49 on a 70-point scale).

Follow-Up Assessments

Immediately following posttreatment, participants and their parent–adult informants repeated the questionnaire batteries and were reinterviewed for psychopathology since intake with the Longitudinal Interval Follow-up Evaluation/K–SADS–E-5 interview procedure. Participants were also assessed at 6 and 12 months, however, these data are not included because of nonsignificant findings previously reported (Rohde et al., 2004).

Treatment Interventions

Efforts were made to equate the two interventions on number of sessions, therapist contact time, therapist–participant ratio, and the use of a point system to reward attendance and participation. For both conditions, mixed-gender groups of up to 10 adolescents were treated in sixteen, 2-hr sessions conducted over an 8-week period.

CWD-A condition. The CWD-A course is a group intervention that combines cognitive and behavioral strategies aimed at ameliorating the types of problems that commonly characterize depressed adolescents. As with most CBT interventions, behavioral skills precede cognitive skills. The CWD-A intervention starts with work on mood monitoring, increasing pleasant activities, improving social skills, and learning relaxation training. These skills generally are the easier to learn and/or facilitate the group process. The central portion of the course focuses on cognitive therapy skills. The last third of the intervention incorporates the teaching of basic communication and problem-solving–conflict-resolution skills, concluding with skills related to depression relapse prevention. It is noted that approximately the same amount of time is devoted to emphasizing each skill area. The CWD-A was modified slightly for use with a comorbid population on
the basis of pilot work, clinical recommendations from treatment staff in
the juvenile correction system, and review of the CBT literature for treating
delinquency. Modifications included (a) the use of two interventionists
(and a college–high school student assistant) to better monitor in-session
behavior and assist with reading and writing problems and (b) shortened
writing assignments.

**LS condition.** The LS-tutoring intervention consisted of current events
review, LS training (e.g., filling out a job application, renting an apartment,
and tutoring. The intervention was not developed to specifically
address problems of depression. Instead, it was developed to fill a void in
the upbringing of many at-risk youths. These youths are, to a large extent,
alienated from other peers and from society in general. They often do not
receive parental guidance and are unacquainted with the most basic skills
necessary to become independent adults. This manualized intervention
attempts to educate participants on basic LS (e.g., writing checks and
opening a bank account, obtaining a general equivalency diploma, filling
out a job application, buying a car, renting an apartment, voting, creating
a budget) in a supportive and nonjudgmental manner.

Although the comparison of the CWD-A versus tutoring–LS provided a
more conservative test of the CWD-A’s efficacy (compared with a no-
treatment control), the LS intervention was used because a no-treatment
control group would have been unethical, psychotherapeutic placebos are
essentially impossible to design, and school performance problems and
circumscribed social functioning are extremely common in this population.

**Therapist Training and Protocol Adherence**

Eight leaders were trained to conduct the CWD-A intervention. Therapists
were required to have at least a master’s degree in the mental health
field and complete 60 hr of training. Four student helpers assisted the
CWD-A leaders. A certified high school teacher and five additional adult
leaders conducted the LS interventions; five student helpers assisted.
Detailed manuals for both conditions were developed to ensure protocol
adherence, and all sessions were videotaped. For a more thorough descrip-
tion of therapist training and protocol adherence, see Rohde et al. (2004).

**Analytic Strategy**

Because we previously established that the CWD-A and LS groups did not
differ on depression symptom change or MDD rates at 6- and 12-month
follow-up assessments (Rohde et al., 2004), there were no follow-up
treatment effects to mediate (i.e., Path C in Figure 1 was nonsignificant).
Similarly, the treatment groups did not result in differences in CD recovery
rates. Accordingly, comparisons in this study were limited to depression
changes during the acute phase—intake to posttreatment. Furthermore, the
acute phase corresponded with delivery of the intervention and was there-
fore the phase of the study when experimental control was maximized.

Mediated treatment effects were assessed following the traditional re-
quirements for testing mediation (Baron & Kenny, 1986), as described in
the Introduction and conveyed in Figure 1. Evidence of mediation was
evaluated following the formulation described by MacKinnon, Lockwood,
Hoffman, West, and Sheets (2002), which statistically compares the dif-
ference between Paths C and C' with a null value of zero, thereby directly
testing the null hypothesis that Path C is not different from Path C'.
Because C minus C' represents the amount of mediation, the rejection of
the null hypothesis supports the existence of mediated intervention effects.
Mplus (Muthén & Muthén, 2001) was used with the path models for its
flexibility in the estimation of missing data with maximum likelihood.
Alpha was set at .05.

**Results**

**Characteristics of the Experimental Groups at Intake**

The average age of participants at intake was 15.1 years ($SD =
1.4$). A total of 45 (48.4%) were female participants and 48
(51.6%) were male participants. Over three fourths of the sample
(80.6%) were European American; the remainder were African
American (1.1%), Native American (3.2%), Asian (1.1%), His-
panic (4.3%), and other (9.7%). Additional demographic charac-
teristics of the sample included the following: 15.1% resided with
both biological parents, 75.0% were attending school, 18.5% had
repeated a grade, and 14.8% had parents with a bachelor’s degree
or higher (a proxy measure of socioeconomic status). Using
Bonferroni-adjusted alpha levels, we determined that participants
in the two treatment conditions did not differ on age, gender, race,
living situation, school attendance, grade repetition, parental edu-
cation at intake, potential mediators, outcomes, or psychiatric
status. Regarding psychiatric status (rates of which did not differ
between conditions), rates at intake for the entire sample were as
follows: 36.6% had a previous history of MDD, 39.8% had a
history of at least one suicide attempt, 12.9% had current dysthy-
mia, 25.8% had current attention-deficit/hyperactivity disorder,
72.0% had a current substance abuse or dependence disorder, and
33.3% had a current anxiety disorder.

Regarding adjunctive (nonresearch) treatment in the 6 months
before intake, 26.1% had received pharmacotherapy, and 41.1%
had been in some form of residential treatment; participants had an
average of 23.7 ($SD = 65.1$) hr of outpatient treatment. Differ-
ences in the rates of adjunctive treatment for participants in the two
conditions at intake were nonsignificant (as were treatment group
differences at posttreatment). The mean number of arrests in the
year prior to intake was 4.0 ($SD = 4.3$). Mean attendance in the
CWD-A and LS conditions did not significantly differ (8.4 [$SD =
5.7$] and 7.6 [$SD = 5.7$] sessions, respectively).

**Mediation Requirement 1: From Treatment Group to Depression (Path C)**

As previously reported (Rohde et al., 2004), CWD-A particip-
ants reported greater reductions from intake to posttreatment in
BDI–II ($d = 0.48$, $p = .033$) and HDRS ($d = 0.44$, $p = .039$)
scores, compared with LS participants. Thus, the first requirement
for a test of mediation was fulfilled. Table 1 contains the means
and standard deviations for both groups at intake and posttreat-
ment, as well as change scores, with respective standard devia-
tions. Table 2 contains the intake-to-post time and treatment
Group $\times$ Time effects for depression and for the potential
mediators.

**Mediational Requirement 2: From Treatment Group to Potential Mediators (Path A)**

Specific therapeutic factors. Participants in the CWD-A con-
dition improved more than participants in the LS condition from
intake to posttreatment on one of the six CBT-specific factors:
ATQ cognitions ($d = 0.50$, $p = .022$). No treatment Group $\times$
Time differences were detected on the remaining factors, although
significant time effects for the Relaxation and Pleasant Activities
scales indicated that participants in both the CWD-A and LS
treatment conditions improved on these measures from intake to
posttreatment.

Nonpecific therapeutic factors. CWD-A participants reported
higher scores on the WAI at the third session ($M = 58.06$, $SD =
12.27$) compared with LS participants ($M = 49.69$, $SD = 13.72$;
$p = .014$, partial $\eta^2 = .097$, $d = .66$). In contrast, differences on
Intake to Posttreatment Effects on Depression and CWD-A Component Measures

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<th>Variable</th>
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<th>α</th>
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<th>SD</th>
<th>M</th>
<th>SD</th>
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Note. Pleasant Activities’ internal consistency is based on the Kuder–Richardson coefficient of reliability. CWD-A = Adolescent Coping With Depression course; LS = life skills; ATQ = Automatic Thoughts Questionnaire; DAS = Dysfunctional Attitude Scale; Relaxation = Pleasant Events Schedule Cross-Product Relaxation Scale; Social Skills = Pleasant Events Schedule Frequency-Count Behavioral Activation Scale; Problem Solving = Issues Checklist.

Table 2
Intake to Posttreatment Effects on Depression and CWD-A Component Measures

<table>
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<th>Variable</th>
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<td>1.081</td>
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<td></td>
<td>Group × Time</td>
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<td>.033</td>
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<td>.931</td>
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<td>0.307</td>
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Mediational Requirement 3: From Mediator to Depression (Path B)

The depression change scores were regressed on the one specific therapeutic factor change score found to differ between treatment groups. Intake to posttreatment change on ATQ cognitions strongly predicted change on BDI–II (β = .71, p = .000), as well as change on HDRS (β = .36, p = .001).

Despite results in the expected direction, associations of the WAI score with both depression outcomes were nonsignificant: BDI–II on WAI (β = -.14, p = .310), HDRS on WAI (β = -.14, p = .301). Because there was no indication that the therapeutic alliance was associated with changes in depression scores, it was not included as a potential mediator in subsequent analyses.

Mediational Requirement 4: Attenuation in Path C (Path C’)

The final test of mediation involved regressing changes in BDI–II and HDRS scores on both changes in ATQ cognitions and treatment group status to assess whether the path between treatment group and depression change was significantly attenuated after accounting for change in the mediator. Figure 2 summarizes the salient path coefficients—A, B, and C’—for the two examined models.

C’: ATQ cognitions and BDI–II. Change on BDI–II was regressed on the treatment group variable along with change on ATQ cognitions. This resulted in full mediation (Z = 2.26, p = .024), which indicated that the difference between C and C’ was significant. As seen in Figure 2, the ATQ cognitions slope had a strong impact on the BDI–II slope (p < .001, β = .69), whereas the treatment group-depression path attenuated and was no longer significant (p = .507, β = .06).

C’: ATQ cognitions and HDRS. When depression was measured with the HDRS, the same pattern held but the magnitude of...
the effect was somewhat smaller. As seen in Figure 2, the path from treatment group to the HDRS slope (β = .14) was no longer significant (p = .164), whereas the relationship between the ATQ cognitions slope and the HDRS slope remained strong (β = .35), and significant (p = .001). However, the test of C versus C’ differing from zero was only a marginal effect (Z = 1.94, p = .053).

Discussion

The purpose of the present study was to contribute to the important but rarely examined question of why CBT appears to be an effective treatment for adolescent depression. We examined six therapeutic factors specific to CBT and two nonspecific therapeutic factors in a clinically representative sample of adolescents with comorbid MDD and CD. Participants were randomly assigned to two treatment conditions, which we attempted to match on nonspecific, but not specific CBT, factors. One CBT-specific factor—rate of automatic negative cognitions—fulfilled the criterion consistent with being a mediator of CBT treatment for depression symptoms.

We found suggestive evidence for mediation by the ATQ using both BDI–II and HDRS as depression outcome measures. Accounting for the change in ATQ scores, the effects of the CWD-A condition were reduced by 75% with BDI–II (from β = .24 to β = .06) and approximately 40% with HDRS (from β = .23 to β = .14). This reduction was significant for BDI–II scores with a marginal trend noted for the HDRS. One explanation for the stronger effects for the self-report BDI–II measure, compared with the clinician-rated HDRS, is that the ATQ and BDI–II are both self-report measures. In addition, others have found greater change on self-report depression measures compared with clinician ratings in adolescent depression trials (e.g., Kolko et al., 2000; Seligman et al., 1999).

The present findings are consistent with Allart-van Dam et al. (2003) and Muñoz et al. (1995), who both found in their prevention studies that measures of negative automatic thoughts were the strongest mediator of depression level changes in group CBT with adults at elevated risk for depression. Also consistent with these two prevention studies is the finding that the PES, as a measure of behavioral activation, failed to mediate reductions in depression symptoms. Contingent on future replication, the present finding suggests that behavioral activation may occur more broadly with psychosocial treatments. Another explanation for this result is that depressed adolescents with comorbid externalizing disorders are already quite active; perhaps behavioral activation plays a mediating role among depressed youths without comorbid disruptive behaviors.

Although the CWD-A appeared to be effective at having a positive impact on negative automatic thoughts, neither the CWD-A nor the LS interventions appeared to have a significant impact on more longstanding beliefs and assumptions associated with depression, as measured by the DAS. In the cognitive model of depression (e.g., Beck, Rush, Shaw, & Emery, 1979), depression is viewed as a consequence of automatic maladaptive thoughts-negative ruminations (as measured by the ATQ), which are reflective of underlying negative assumptions and core beliefs (as measured by instruments such as the DAS). The CWD-A course may not devote enough time to cognitive work to achieve change beyond the automatic thought level. More intensive cognitive therapy interventions with depressed adults have demonstrated change on the DAS scores (e.g., Barber & DeRubeis, 2001; DeRubeis et al., 1990). A second explanation for the nonsignificant DAS findings is that, relative to the ATQ, the DAS appears to have less specificity with depression (Hill, Oei, & Hill, 1989). For example, Hollon, Kendall, and Lumry (1986) found that the DAS did not discriminate depressed adults from a general psychiatric control group. Given that the majority of participants in our study had concurrent conduct and substance use disorders, neither of which changed significantly during acute treatment (Rohde et al., 2004), in hindsight, change in the DAS may not have been realistic. Finally, consistent with the present study, the ATQ has been found in research with depressed adults to be more highly correlated with depression levels compared with the DAS (Hill et al., 1989; Hollon et al., 1986).

The CWD-A course is an adolescent modification of the Coping with Depression (CWD) course, which was originally developed for depressed adults (Levinsohn, Steinmetz-Breckenridge, Antonuccio, & Teri, 1987). The CWD was designed on the basis of research by Zeiss, Levinsohn, and Muñoz (1979), who found that depression interventions focusing exclusively on interpersonal skills, cognitions, or pleasant activities resulted in comparable rates of recovery, with no treatment intervention having a unique
impact on the factors theoretically most relevant to that specific modality (e.g., participants in all three treatment modalities improved equally on rates of pleasant activities, depressotypic cognitions, and interpersonal skills). On the basis of those findings, the CWD was designed to provide training in a variety of skills, with the assumption that each client would benefit from at least some of the skills. In contrast to the conclusions reached by Zeiss et al., the present study suggests that changes in negative thinking may be most directly related to reductions in depression for CWD-A participants. Furthermore, because underlying belief systems were not shown to markedly change, but depression symptoms were reduced as a function of reducing negative automatic thoughts, it may not be necessary for clinicians to engage in intensive cognitive therapy for adolescent patients to experience a clinically significant alleviation of depression symptoms. One possible explanation for the inconsistent findings regarding specificity of CBT effects from the present study and those of Zeiss et al. is that the latter study might have observed reductions in all domains across all three treatments because they did not use an active intervention control group. This interpretation suggests that it may be necessary to use alternative-intervention control groups to draw valid inferences regarding the specificity of treatment effects.

These conclusions, however, presume that all of the mediators were measured equally well. Potential mediators in the present study varied in item length and psychometric properties, with the one significant mediator being assessed by a relatively large number of items. Therefore, it is possible that the pattern of our findings was influenced by varying reliability and validity properties across measures.

In addition to the therapeutic factors specifically associated with CBT, therapists in both interventions attempted to develop and maintain strong group cohesion and a positive alliance with the therapist. Both group cohesion and a single-item index of perceived therapist competence by the third session were comparable between conditions, whereas alliance with the therapist was higher in the CWD-A intervention. This higher therapeutic alliance by the third session in the CBT treatment did not, however, predict greater prepost change on depression and therefore could not function as a mediator of depression outcomes. Consistent with the present study, DeRubeis and Feeley (1990) found that therapeutic alliance in individual cognitive therapy with depressed adults did not predict subsequent depression remission. They found, however, that the helping alliance was predicted by prior symptom reduction. Given that a substantial minority of depressed clients in CBT interventions experience significant depression remission early in the treatment (e.g., Gaynor et al., 2003; Ilardi & Craighead, 1994), the presumably faster depression recovery rates in the CWD-A compared with the LS control intervention may have contributed to the stronger therapeutic alliance by the third session. In a recent meta-analysis, Shirk and Karver (2003) found that the therapeutic relationship had a stronger impact on treatment outcome for adolescents with externalizing, as opposed to internalizing, disorders. Given the paucity of research on these questions, continued inclusion of nonspecific therapeutic factors in studies evaluating mediators of intervention effects appears warranted.

The present study had several strengths. First, the CWD-A was compared with an alternative nonspecific intervention condition, rather than either a no-treatment control group or an established treatment for depression. If the two treatments had been equally effective in reducing depression, then the first step of mediation would not have been met and the analysis would have stopped there. If a no-treatment control had been used, then we could not have examined the impact of nonspecific therapeutic factors. Our intention was to have two treatments that were comparable on nonspecific therapeutic factors but different on specific CBT factors. Given that both specific and nonspecific therapeutic factors were evaluated, the study provided information regarding the relative importance of specific versus nonspecific factors. The findings lend partial support to the hypothesis that CBT interventions have an impact on depression through mechanisms that are specific to treatment, as opposed to nonspecific factors. Another strength is that the study had aspects of both efficacy and effectiveness research (Nathan, Stuart, & Dolan, 2000), with a sample that was more clinically representative than previous research. This enhances the external validity of the findings. Lastly, the examination of two measures of depression from different sources (i.e., participant and interviewer) provided an opportunity for replication, which increases our confidence in the findings.

There are also several limitations that should be noted. The primary limitation is that our mediators were measured at only intake and posttreatment, simultaneous with measurement of the depression outcomes. Thus, skill changes could be mediators or could simply be epiphenomena reflective of the multidomain improvements associated with reduced depression levels. Our two-wave design cannot differentiate cause from effect (e.g., Holton et al., 1987). A more rigorous test of mediation would require that changes in the skill mediators temporally precede changes in the outcome variables. For example, DeRubeis et al. (1990) assessed depression and cognitions at the beginning, middle, and end of cognitive therapy or pharmacotherapy with depressed adults. They found that changes from intake to midtreatment on three of the four cognitive measures (one of which was the DAS) predicted reductions in depression scores from midtreatment to the end of cognitive treatment. In future trials, we recommend measuring mediators and depression outcomes repeatedly across time to allow for the generation of growth curves, which can then be compared with each other within a latent growth model (Duncan, Duncan, Strycker, Li, & Alpert, 1999) framework—an approach that is receiving increasing attention (e.g., Cole & Maxwell, 2003).

The second limitation concerns the measures. In addition to differences in psychometric properties of the various mediators, our measures of mediators did not assess skill acquisition or performance directly. For example, the CBT factor of social skills should ideally assess the use of nondepressive actions (e.g., smiling, making eye contact, starting conversations). However, because the measures we selected had to be meaningful to participants in both treatment conditions both before and after treatment, we measured functioning levels associated with use of each of the theoretically important skills. Our assumption in the present study is that higher functioning in the relevant domain is associated with higher use of the specific CBT skills.

As a third limitation, aspects of our sample may limit generalizability. First, participants were required to have MDD comorbid with CD; in fact, the average number of current diagnoses at intake was more than four. A different pattern of findings may have been present in a purely depressed adolescent sample. In addition, the adolescents in our sample were primarily European American and of a lower socioeconomic status. All were in contact with the juvenile justice system. Each of these factors may reduce the
degree to which our results apply to the broader population of depressed adolescents.

A fourth limitation relates to the treatment dose and associated response. Rates of attendance in both treatment conditions were relatively low (i.e., limited dose), and less than half of the participants in both groups had recovered from their MDD by the end of treatment (i.e., limited response). Although attendance rates in the present study were lower than those obtained with purely depressed community adolescents, our attendance rates are consistent with those achieved with adolescents with externalizing problems (e.g., Kazdin, 1996). More important, we previously reported that higher attendance rates were not associated with greater MDD recovery (Rohde et al., 2004). Regarding the recovery rates achieved by participants in the present study, future research needs to examine methods of improving the recovery rates (e.g., extend duration of treatment, augment treatment with other forms of intervention, booster sessions). Clearly, more studies evaluating treatment response with comorbid samples are needed.

In conclusion, it is commonly accepted that CBT is an effective treatment for depression in both adults and adolescents. It is surprising, then, that little is known regarding why CBT works. Until the matter is further explored and clarified in a systematic and replicable fashion, this fundamental question is—and should remain—of paramount importance. Identifying and understanding the treatment mechanisms underlying therapeutic change affects the future development of intervention theory, the promulgation and implementation of specific therapeutic techniques, as well as refinements in the design of interventions. It also helps us understanding of the factors that may maintain a disorder such as depression (e.g., Hinshaw, 2002). Our hope is that the present study improves research designs of future psychotherapy evaluation studies and contributes to what is presently known about how to treat adolescent depression.

References


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