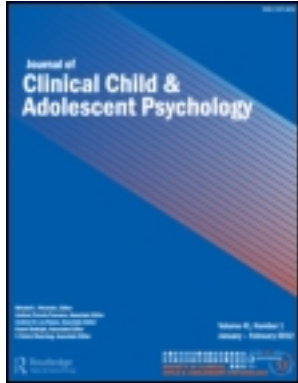


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Processes of Change in CBT of Adolescent Depression: Review and Recommendations

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Processes of Change in CBT of Adolescent Depression: Review and Recommendations

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A growing body of research supports the efficacy of cognitive-behavioral therapy (CBT) for adolescent depression. The mechanisms through which CBT exerts its beneficial effects on adolescent patients suffering from depression, however, remain unclear. The current article reviews the CBT for adolescent depression process literature. Our review focuses on several process variables: the therapeutic alliance, patient cognitive change, and therapist adherence to, and competence in, the theory-specified techniques of therapy. Given that the vast majority of CBT process research has been conducted in the context of adult psychotherapy, we also review relevant adult research as a framework for understanding adolescent process research and to inform future investigations. Methodological issues are addressed and recommendations for future process research are raised.

Cognitive-behavioral therapies (CBTs) are among the most extensively studied class of psychotherapeutic modalities for depression (Butler, Chapman, Forman, & Beck, 2006). CBTs, and in particular Cognitive Therapy (CT or “Beckian CBT”; Beck, Rush, Shaw, & Emery, 1979), the variant of CBT associated with Aaron Beck,

have been subjected to numerous outcome investigations of the treatment of depression in adults. Several comparative outcome trials indicate that CT is at least as effective as antidepressant medications at alleviating clinically significant depressive symptoms (see DeRubeis, Webb, Tang, & Beck, 2010, for a review; see Dimidjian et al., 2006, and Elkin et al., 1989, for exceptions).

CBT outcome research in children and adolescents has lagged behind the adult literature. However, a growing body of research supports the general efficacy of CBT for depression in youth (Klein, Jacobs, & Reinecke, 2007; Weersing & Gonzalez, 2009; Weisz, McCarty, & Valeri, 2006). Although evidence has accrued in support of the efficacy of CBT for depression in adults and, more recently, youth, the mechanisms through which CBT exerts its beneficial effects is less clear. Research examining the mechanisms of change in psychotherapy falls within the domain of “psychotherapy process research.” Capturing the broad scope of the term, Orlinsky and Howard (1986) defined

The first (Webb) and second (Auerbach) authors of this article are both former students of John Abela (Webb as an undergraduate student, Auerbach as a graduate student) during his tenure at McGill University. We wish to express our heartfelt gratitude to John R. Z. Abela, whose untimely passing shocked everyone who knew him. John’s dedication to his research and students was unparalleled. We would not be where we are today professionally if it was not for his guidance and the countless opportunities he provided us. John was truly a great mentor and friend. The third author (DeRubeis) recalls John with great fondness from the time he was one of John’s teachers and mentors at Penn, and from many memorable encounters with him in the last decade or more, as John was fulfilling the promise that was so evident when he was a graduate student.

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psychotherapy process as “everything that can be observed to occur between and within the patient and therapist during their work together” (pp. 311–312). Process research in the youth psychotherapy literature has been particularly sparse (Kazdin & Nock, 2003; Shirk & Karver, 2006; Weersing, Rozenman, & Gonzalez, 2009).

In an effort to elucidate the mechanisms of therapeutic improvement in CBT for depression, process researchers have examined the association between a variety of therapy process variables and treatment outcome, including therapist variables (e.g., adherence to CBT techniques; empathy), patient variables (e.g., homework compliance, cognitive change, behavior change, metacognitive or compensatory skills, the extent to which patients facilitate or impede the techniques delivered by their therapists), and the interaction between therapist and patient (e.g., the therapeutic alliance). Psychotherapy process research is an important endeavor for several reasons (Kazdin & Nock, 2003; Laurenceau, Hayes, & Feldman, 2007). Although the core aims of process research are to understand the mechanisms of therapeutic change (from the delivery of specific treatment procedures to changes in pathogenic mechanisms to symptom improvement) and to isolate the “active ingredients” of treatment, the ultimate long-term goal is to apply this knowledge in order to maximize the efficacy and efficiency of treatment while minimizing or eliminating any inert or iatrogenic elements (Shirk & Karver, 2006).

The current article reviews studies that have investigated variables that may help account for symptom improvement in CBT for adolescent depression. Studies of individual, group, and family therapy, as well as bibliotherapy, are included in the review. We begin with a review of the literature on the therapeutic alliance, the variable that has received the most attention in the psychotherapy process literature. In addition, we review research on variables that are considered particularly important within the theory of change associated with CBT, namely, patient cognitive change and therapist adherence to, and competence in, CBT methods. As the great majority of CBT process research has been conducted in the context of adult psychotherapy, we review relevant adult research as a framework for understanding adolescent process research and to inform future investigations. Developmental differences in youth and adults that may impact treatment processes are also discussed. We conclude by discussing methodological issues and offer recommendations for future youth process research.

THE THERAPEUTIC ALLIANCE

The therapeutic alliance, which has been the focus of numerous empirical investigations of the processes of

psychotherapies, has been proposed as a central and especially important factor for treatment success in both adult (Horvath & Bedi, 2002; Martin, Garske, & Davis, 2000) and youth psychotherapies (Shirk & Karver, 2006). Establishing a strong therapeutic alliance with adolescent clients may pose unique challenges for therapists for a variety of reasons, including developmental (e.g., increasing desire for autonomy and independence from adults) and parental factors (e.g., parental role in the initial decision to seek treatment, parental involvement in therapy, fear of sensitive issues being disclosed to parents; Karver et al., 2008; Shirk & Karver, 2003; Storer, 2010; Zack, Castonguay, & Boswell, 2007). Consequently, to the extent that such issues are present, adolescent, relative to adult, clients may be more likely to engage in a range of therapy-impeding behaviors, such as failing to complete assigned homework, low involvement in session activities, lack of engagement with the therapist, sporadic attendance, or premature attrition from treatment. Thus, the initial formation and maintenance of a strong alliance between therapists and patients, as well as a keen awareness of any signs of alliance ruptures in the midst of treatment, may be both particularly challenging and especially critical in the context of adolescent psychotherapy (Shirk & Karver, 2003). Some studies in the adult literature have provided preliminary support for the efficacy of interventions aimed at enhancing therapists’ alliances with their patients (e.g., Crits-Christoph, Gibbons, Crits-Christoph, Narducci, Schamberger, & Gallop, 2006; Hilsenroth, Ackerman, Clemence, Strassle, & Handler, 2002), as well as those designed to help therapists navigate and resolve alliance ruptures (see Eubanks-Carter, Muran, & Safran, 2010, for a recent review). This line of research is important as it suggests that a relational variable that may contribute to better patient outcomes can be enhanced through specialized therapist training. Similar studies in adolescent psychotherapy may lead to the identification of therapist behaviors that contribute to, or detract from, the formation and maintenance of strong therapeutic alliances with patients. Moving forward, it will be important to conduct experimental studies investigating whether strengthening the alliance between therapists and adolescent clients through alliance-fostering therapist training results in better treatment outcomes.

Recent meta-analytic reviews of the relationship between the therapeutic alliance and treatment outcome have been published in both the adult (Horvath, Del Re, Flückiger, & Symonds, 2011) and youth (Shirk, Karver, & Brown, 2011) psychotherapy literatures. With regard to the adult literature, numerous studies have examined the association between the alliance and outcome, across a variety of treatment modalities and mental health problems. In their recent review, Horvath et al. identified more than 200 studies that examined alliance-outcome

associations and found that, on average, stronger alliances are associated with better treatment outcomes (mean alliance-outcome correlation [r] = .28). However, causal inferences from the alliance literature are limited by pervasive temporal confounds (Barber, 2009; Feeley, DeRubeis, & Gelfand, 1999; Strunk, Brotman, & DeRubeis, 2010). The alliance has typically been assessed in the midst of treatment (e.g., Session 3 or later) and correlated with symptom change from pre-treatment to posttreatment. Within the context of such designs, a significant alliance-outcome association may be due, at least in part, to the influence of prior symptom change on the quality of alliance (Feeley et al., 1999; Stiles, Shapiro, & Elliott, 1986). In the few studies that have controlled for these temporal confounds, alliance-outcome findings have been inconsistent (Barber, 2009; Strunk, Brotman, & DeRubeis, 2010).

In contrast to the numerous alliance-outcome studies in the adult literature, Shirk et al. (2011), in their review of the youth literature, identified only 16 alliance-outcome studies that met their inclusion criteria. Aggregating across these studies, the mean alliance outcome correlation ($r = .22$) was similar to that observed in the adult literature by Horvath and his colleagues (2011). We are aware of only three published studies in which the association between the alliance and treatment outcome has been examined in CBT for adolescent depressive symptoms (Karver et al., 2008; Kaufman, Rohde, Seeley, Clarke, & Stice, 2005; Shirk, Gudmundsen, Kaplinski, & McMakin, 2008), and in none of them were analyses presented that allowed the authors to rule out a temporal confound. In a sample of clinically depressed adolescents receiving a maximum of 12 sessions of individual CBT, Shirk and his colleagues (2008) found that patient-rated alliance was significantly correlated with depressive symptom change. Although correlations were in the predicted direction, therapist-rated alliance was not significantly associated with changes in depression. Kauffman et al. (2005), in their study of a 16-session group CBT protocol for comorbid clinical depression and conduct disorder among adolescents, reported a small, but nonsignificant, association between alliance and depressive symptom improvement. In the third study, moderate correlations of .35 and .31 between two measures of the alliance and depressive symptom change were reported (Karver et al., 2008).¹ However, their CBT sample was small ($N = 11$), and significance tests were not reported for these analyses.

THE THERAPEUTIC ALLIANCE: DIRECT AND/OR INDIRECT CONTRIBUTIONS TO OUTCOME

In the CBT literature, the alliance is often conceptualized as a vehicle for facilitating the delivery and impact of techniques on patient symptom improvement, rather than an active therapeutic ingredient in and of itself (Beck et al., 1979; Castonguay, Constantino, McAleavey, & Goldfried, 2010). In other words, the alliance is generally considered a necessary, but not sufficient, cause of improved outcomes in CBT. To test the clinical notion that therapist interventions are more therapeutically beneficial within the context of a strong, rather than a weak, alliance, studies are needed that examine Alliance \times Technique interactions in predicting treatment outcome in CBT for adolescent depression. The use of relatively large samples will be particularly important to provide adequately powered tests of such interactions.

Alternatively, some scholars have speculated about more direct ways in which the alliance may result in therapeutic benefits. For example, rather than merely providing the facilitative context for therapists to deliver CBT techniques, the alliance may be utilized by therapists as an in-session tool to observe and alter maladaptive interpersonal behaviors, modify distorted cognitions, and promote corrective emotional and need-satisfying experiences (e.g., Castonguay et al., 2010; Holtforth & Castonguay, 2005; Safran & Segal, 1990; Young, Klosko, & Weishaar, 2003). Such an approach to the alliance undoubtedly requires a therapist who is sufficiently skilled in utilizing the therapeutic relationship as a tool to facilitate therapeutic learning and corrective experiences.

If alliance-outcome associations are obtained in studies of adolescent depression that control for temporal confounds, further research will be needed to examine plausible mediators of these associations. Candidates include engagement in in-session activities, homework compliance, or corrective interpersonal or emotional experiences. For example, although based on a small sample, Karver et al. (2008) reported that the alliance, assessed at Session 3, predicted client involvement in treatment, measured the following session. A meditational model was not tested to examine whether client involvement mediated alliance-outcome associations. In contrast, in addition to testing the direct relation between alliance and outcome, Shirk et al. (2008) examined whether alliance-outcome associations were mediated by the number of sessions attended. Therapist-rated, but not patient-rated, alliance was significantly associated with sessions completed. However, an indirect or meditational model of the relation between alliance and outcome was not supported by their data.

¹The Karver et al. (2008) sample consisted of adolescent clients who had recently attempted suicide but who also reported depressive symptoms.

THERAPIST ADHERENCE AND COMPETENCE

Psychotherapy researchers have also examined the extent to which therapies, including CBTs, are implemented as intended. Both therapist *adherence* (i.e., the extent to which therapists are delivering the techniques/methods prescribed by the treatment modality in question, and avoiding proscribed interventions) and *competence* (i.e., the *skill* with which these techniques/methods are implemented; Barber et al., 2006; Sharpless & Barber, 2009) have been studied. It is important to highlight that whereas measures of therapist adherence generally only assess how frequently or thoroughly therapists employ particular interventions, measures of competence, in contrast, are intended to assess the skill or appropriateness of the delivery of these techniques. Measures of adherence and competence have been employed in treatment outcome studies to assess whether the psychotherapy conditions were implemented as intended. For example, in the Treatment of Resistant Depression in Adolescents randomized clinical trial, Brent et al. (2008) used the Cognitive Therapy Scale (Young & Beck, 1980) to assess the degree to which their CBT condition was competently delivered by study therapists.

However, adequate assessments of treatment integrity are not the norm in psychotherapy outcome trials, especially in studies of youth psychotherapy. In their review, Weisz, Doss, and Hawley (2005) lamented that in only 32% of the 236 youth psychotherapy studies they examined did the authors report using any adherence checks or supervision procedures. (The value was 67% for studies targeting depression.) Perepletchikova, Treat, and Kazdin (2007) not only assessed whether youth and adult psychotherapy trials included treatment integrity checks but also rated the adequacy of integrity procedures. Only 3.5% of the studies they reviewed met their criteria for adequate implementation and reporting of treatment integrity procedures.

In addition, researchers have also examined the association between measures of therapist adherence, or competence, and treatment outcome (see Webb, DeRubeis, & Barber, 2010, for a review). Both adherence-outcome and competence-outcome findings in the adult CBT literature have been mixed. For example, whereas in some studies higher levels of therapist adherence to CT techniques have been associated with reductions in depressive symptoms (e.g., DeRubeis & Feeley, 1990; Feeley et al., 1999; Strunk, Brotman, & DeRubeis, 2010) in others null (e.g., Elkin, 1988; Shaw et al., 1999) or even *inverse* adherence-outcome findings (e.g., Castonguay, Goldfried, Wiser, Raue, & Hayes, 1996) have been reported. Similar to the adherence-outcome literature, competence-outcome findings in studies of

CBT have been inconsistent, with some reporting positive findings, at least for some measures (e.g., Kuyken & Tsivrikos, 2009; Shaw et al., 1999; Strunk, Brotman, DeRubeis, & Hollon, 2010) and others reporting null findings (e.g., Hogue et al., 2008).

In comparison to the adult literature, very few studies have examined either adherence-outcome or competence-outcome relations in studies of youth CBT. Such research, which typically involves the coding of session recordings, is time intensive and labor intensive, in contrast to studies of the alliance, in which patient self-report ratings are common (Horvath et al., 2011).

Our literature search failed to identify any investigations of the associations between adherence or competence to CBT and depressive symptom improvement among depressed adolescents. However, several studies have examined such relations in psychotherapy targeting other disorders in adolescents. For example, Hogue et al. (2008) examined the relation between both adherence and competence, rated by independent observers, and treatment outcome in individual CBT as well as in multidimensional family therapy (MDFT) for adolescent substance use (75% of patients met *Diagnostic and Statistical Manual of Mental Disorders* [4th ed.; American Psychiatric Association, 1994] criteria for cannabis dependence) and related behavior problems (79% met criteria for oppositional defiant and/or conduct disorder). Stronger adherence to CBT, but not MDFT, was associated with reductions in adolescent drug use. Collapsing across both treatment groups, greater adherence was associated with reductions in parent-reported, but not youth-reported, externalizing symptoms. There were no significant competence-outcome findings for either treatment modality. Of interest, a curvilinear adherence-outcome finding emerged across CBT and MDFT, such that intermediate (rather than low or high) levels of adherence to these treatments were associated with the greatest reduction in parent-reported internalizing behaviors. Curvilinear fidelity-outcome associations have also been observed in the adult psychotherapy literature (e.g., Barber et al., 2006). These findings may reflect the clinical intuition that “more is not always better” with regards to the delivery of treatment techniques. Meaning both low (overly lax) and high (overly rigid) levels of therapist adherence may be problematic.

Huey, Henggeler, Brondino, and Pickrel (2000) tested adherence-outcome relations in two samples of juvenile offenders receiving multisystemic therapy (MST) for delinquent behavior. Although not strictly a cognitive-behavioral treatment, MST incorporates CBT and behavior therapy techniques, along with a range of other pragmatic and goal-oriented strategies (Henggeler, Cunningham, Pickrel, Schoenwald, & Brondino, 1996). Although there were some exceptions, Huey and his colleagues generally found that adherence to MST (as rated

by therapists, caregivers, and youth) was associated with better treatment outcomes, including improved family functioning and parent monitoring, as well as reductions in both delinquent peer affiliations and behavior. Association between treatment fidelity and improved youth outcomes have also been reported in other studies of MST for juvenile offenders (e.g., Henggeler, Melton, Brondino, Scherer, & Hanley, 1997; Henggeler, Pickrel, & Brondino, 1999).

More recently, Robbins et al. (2011) examined adherence-outcome relations in Brief Strategic Family Therapy (BSFT; Szapocznik, Hervis, & Schwartz, 2003) for adolescent drug abusers. BSFT is a short-term, family-based, problem-focused intervention rooted in the systemic theory of family functioning (Szapocznik et al., 2003). Previous adherence-outcome studies of family therapy have typically restricted their analyses to an examination of the association between overall adherence (e.g., averaging across a range of different interventions) and treatment outcome. In contrast, Robbins et al. (2011) examined the relation between four factor-analytically-derived components of adherence to BSFT, rated by independent observers, and outcome. These adherence factors included (a) "joining with individual family members and the family system," (b) "tracking and eliciting family interactions," (c) "reframing," and (d) "restructuring family interactions" (Robbins et al., 2011). In addition, to explore hypothesized differences in the emphasis placed on these categories of interventions at different stages of treatment, the authors assessed these adherence factors during early, middle, and late phases of therapy. Therapist adherence was associated with higher levels of engagement and retention in treatment, improved family functioning, and reduced drug usage. The authors also reported that therapists varied their use of interventions over the course of treatment in ways consistent with BSFT theory. They observed a greater use of "joining" interventions early in treatment and an increased use of "restructuring" interventions as therapy progressed.

As discussed in more detail next (see Methodological Issues and Recommendations for Future Youth Process Research section), there are several methodological features common to studies of adherence-outcome and competence-outcome associations in the adult literature that limit the inferences that can be derived from them. It will be important for studies investigating therapist use of CBT techniques within the context of psychotherapy with adolescents to consider these issues in their study designs in an effort to maximize the accuracy of estimates of these associations. Moreover, in addition to examining the association between mean scores on adherence measures assessing a variety of different CBT techniques and treatment outcome, additional research is needed investigating whether particular

CBT methods (e.g., behavioral activation methods vs. cognitive restructuring strategies) are especially therapeutically beneficial to adolescent clients suffering from depression. It may be particularly critical for CBT therapists to target categories of stressors (e.g., interpersonal stressors related to peers and parents), and associated negative cognitions, that are especially relevant and salient to adolescent clients.

COGNITIONS

The variants of CBT that have been tested empirically vary on a number of dimensions including format (e.g., individual, group, family, couples, computerized, overall length of treatment), content (e.g., the extent to which cognitive vs. behavioral strategies are emphasized, the degree to which techniques from other treatment modalities are incorporated) and style (e.g., therapist use of didactic persuasion vs. Socratic questioning; Dobson & Dozois, 2010; Weersing & Gonzalez, 2009; Weersing et al., 2009). However, CBTs for depression share an underlying theory of change that emphasizes the identification and modification of negative or maladaptive cognitions and behaviors. Depressogenic cognitions and maladaptive information processing are assumed to play a key role in the etiology and maintenance of depression. Their amelioration, by the use of cognitive and behavioral strategies, drives changes in depressive symptoms, according to the theory (Beck et al., 1979; DeRubeis et al., 2010).

Consistent with this theory of change, a number of studies have found that CBT for depression in adults is associated with reductions in negative cognitions (see Garratt et al., 2007, for a review). In addition, in some investigations changes in negative cognitions have been associated with subsequent changes in depressive symptoms (e.g., DeRubeis et al., 1990; Tang & DeRubeis, 1999; Tang, DeRubeis, Beberman, & Pham, 2005; but see Jarrett, Vittengl, Doyle, & Clark, 2007, for a recent exception). Despite the central role of cognitive change in CBT theory, the research designs employed in studies investigating cognitive change are such that few go beyond showing that CBT is associated with reductions in measures of both dysfunctional cognitions and depressive symptoms and that these variables are correlated with one another (Garratt et al., 2007; Haaga, 2007; Jarrett et al., 2007; Kazdin, 2007). Moreover, even when significant correlations are observed, research designs rarely control for temporal confounds, leaving open the question of whether changes in depressogenic cognitions contribute to changes in depressive symptoms, or vice versa. Elucidating the role of negative cognitions in accounting for depressive symptom improvement in CBT, including

capturing the time line of causal relations faithfully (either unidirectional or bidirectional), is a tremendous challenge for process researchers (DeRubeis et al., 1990).

In studies involving depressed adolescents, similar to research on depressed adults, CBT has been shown to result in reductions in some measures of negative cognition (e.g., see Ackerson, Scogin, McKendree-Smith, & Lyman, 1998, for findings in cognitive bibliotherapy; Kaufman et al., 2005, for group CBT; Kolko, Brent, Baugher, Bridge, & Birmaher, 2000, for individual CBT; see Abeles et al., 2009, for computerized CBT). In addition, in their review, Weersing and Gonzalez (2009; see Figure 21.2) reported that CBT for depressed adolescents, on average, resulted in greater changes in depressogenic cognitions relative to comparison conditions.

We are aware of three studies of CBT for adolescent depression that have included tests of cognitive mediation.² Kauffman et al. (2005) examined several plausible mediators, including changes in negative automatic thoughts and dysfunctional attitudes, of the symptom-reduction effects of group CBT for adolescents with comorbid clinical depression and conduct disorder. Patients were randomly assigned to either CBT or a life skills (LS)-tutoring nonspecific control condition (Rohde, Clarke, Mace, Jorgensen, & Seeley, 2004). The CBT group, relative the LS condition, evidenced significantly greater reductions on measures of depressive symptoms over the course of the acute (pretreatment to posttreatment), but not the follow-up, phases of the trial. Therefore, Kauffman et al. restricted their mediation analyses to the acute phase. Patients in the CBT condition reported significantly greater reductions on the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980), but not the Dysfunctional Attitude Scale (DAS; Weissman & Beck, 1978), in comparison to patients in the LS condition. In addition, improvements in ATQ scores were significantly associated with reductions on both measures of depressive symptoms, even after controlling for the effect of treatment condition. In contrast, after controlling for ATQ scores, between-group differences in depressive symptom improvement were attenuated and no longer significant. It is important to note that these mediation analyses were based on concurrent assessments (at pretreatment and posttreatment) of negative cognitions and depression symptoms. Thus, temporal precedence of the mediator before outcome could not be established, leaving open the possibility that changes

in negative cognitions were consequences of, or simply co-occurred with, changes in depressive symptoms.

Ackerson et al. (1998) tested cognitive mediation within a randomized comparison of CBT-based bibliotherapy versus a waitlist control for depressed adolescents. The bibliotherapy condition resulted in significantly greater reductions in depressive symptoms, relative to the control group. In a reverse of the pattern obtained by Kauffman et al. (2005), the bibliotherapy group evidenced significantly greater reductions in scores on the DAS, but not the ATQ, relative to the control group. Results supported mediation for the one self-report measure of depressive symptoms but not for the other two depression measures (clinician rated and parent/guardian rated). As was true of the Kauffman et al. study, mediation analyses conducted by Ackerson et al. were based on concurrent assessments of cognitions and depressive symptoms.

Finally, Kolko et al. (2000) explored processes of change in a randomized clinical trial comparing individual CBT, systemic-behavioral family therapy, and individual nondirective supportive therapy for adolescent depression (see Brent et al., 1997, for comparative outcome findings for this trial). In comparison to the systemic-behavioral family therapy and nondirective supportive therapy groups, CBT resulted in greater reductions in adolescent-reported cognitive distortions, but not hopelessness, over the acute treatment phase. No significant between-group differences emerged in changes on cognitive measures for their follow-up (2-year) analyses. The authors did not report tests of mediation of treatment outcome differences, as they did not detect any significant group differences, either at the end of the acute treatment phase or at the 2-year follow-up, on the two measures of depressive symptoms they examined. (It should be noted that in the original publication by Brent et al., CBT was found to be superior to the comparison conditions on several measures of depression.)

In contrast to Kauffman et al. (2005) and Ackerson et al. (1995), Kolko et al. (2000) included a midtreatment assessment of negative cognitions and depressive symptoms, in addition to assessing these variables at pretreatment, posttreatment, and follow-up time points. Although Kolko et al. included only a single midtreatment assessment, such a design does allow for the examination of changes in negative cognitions and depressive symptoms in the first half of treatment and their relations with subsequent changes on these variables in the second half of treatment. Such a design can test predictive, as opposed to correlational relations between pretreatment-posttreatment changes in negative cognitions and depressive symptoms. The former design is thus better suited (albeit not as ideal as multiple midtreatment assessments) to establish the temporal

²At the time of this writing, tests of cognitive mediation in the highly discussed Treatment for Adolescents with Depression Study study were ongoing (R. H. Jacobs, personal communication, February 9, 2011).

precedence of change in the putative mediator relative to measures of outcome.

One of the steps within the commonly used mediation procedures outlined by Baron and Kenny (1986), as well as a requirement of the abbreviated Test of Joint Significance (see MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), requires that X is significantly associated with the hypothesized mediator. In testing cognitive mediation in the context of comparative outcome trials of CBT, this step would require that CBT results in significantly greater reductions on a measure of negative cognition than an alternative “noncognitive” treatment (DeRubeis et al., 1990). Such studies have typically used pharmacotherapy as the comparison condition, although some have also examined the degree of cognitive change in CBT compared to a noncognitive psychosocial treatment (e.g., Jacobsen et al., 1996; McNamara & Horan, 1986; Wilson, Goldin, & Charbonneau-Powis, 1983). Overall, the literature on the *specificity* of cognitive change is quite mixed, with a number of studies finding no significant differences in reductions in negative cognitions between CBT and noncognitive treatments, including antidepressant medications (ADMs; see Garratt et al., 2007, for a review). However, recent findings from the Treatment for Adolescents with Depression Study suggest that CBT may result in greater reductions in extreme negative thinking, operationalized as the sum of extreme endorsements of items assessing depressotypic beliefs on the DAS, relative to ADM and a combined CBT and ADM condition (R. H. Jacobs, personal communication, February 14, 2011; Jacobs et al., 2010).

There are several interpretations of depression treatment studies that find similar reductions in negative cognitions in CBT versus ADMs (Hollon, DeRubeis, & Evans, 1988). For example, reductions in negative cognitions may be more of a consequence of depressive symptom improvement in ADM treatment but a cause of symptom change in CBT. The relation between depressogenic cognitions and depressive symptoms are likely bidirectional, but the directionality of such causal relations can only be examined in treatment studies if assessments of cognitions and symptoms are taken not only at pre- and posttreatment but also during treatment. Repeated assessments then allow for the prediction of change in one variable from prior change in the other. In addition, perhaps the measures and methodologies utilized in studies comparing CBT and ADM treatment are not sufficiently sensitive or well suited to reveal significant differences in cognitive change. In particular, given the distinction between “surface” (automatic thoughts) and “deep” (e.g., core beliefs) cognitions, it may be that the changes in negative thinking reported in studies of ADM treatment are relatively superficial in comparison to those occurring in successful CBT. Indeed, the lower relapse rates that have been

observed in patients that have previously received CT relative to ADM (e.g., Dobson et al., 2008; Hollon et al., 2005) may be due in part to “deeper” cognitive changes produced by CT. Consistent with this claim, Segal, Gemar, and Williams (1999) found that there were no significant differences in DAS scores among patients treated to remission via CBT or ADM. However, following a sad mood induction, the patients previously treated with ADM evidenced a greater increase in DAS scores in comparison to those treated with CBT, suggesting that CBT may have resulted in “deeper” changes in negative cognitions. Moreover, heightened cognitive reactivity to the mood challenge was associated with an increased risk of relapse in the 30-month follow-up phase of the study. Similar findings were obtained in a subsequent study by Segal et al. (2006; also see Dozois et al., 2009).

As just reviewed, investigations of cognitive mediation in CBT for adolescent depression have been rare. The few studies that have been published have yielded inconsistent findings, and they generally have not included attempts to control for temporal confounds. Efforts to clarify the nature of the association between maladaptive cognitions and depressive symptoms in CBT for adolescent depression will require more sophisticated studies in which cognitions and symptoms are assessed repeatedly, using psychometrically-sound measures.

A core aim of CBT is to promote the development of a particular set of skills and understandings that are hypothesized to alleviate distressing symptoms and prevent their recurrence following successful treatment (Barber & DeRubeis, 1989; Strunk, DeRubeis, Chui, & Alvarez, 2007). In future investigations of CBT for adolescent depression it will be important for researchers to assess the acquisition and use of the compensatory or metacognitive skills encouraged by CBT therapists (e.g., distancing, learning to identify and challenge depressogenic cognitions), in addition to assessments of changes in negative cognitions and information-processing biases. Several such measures have been developed and implemented in studies of CBT for adult, but not youth, depression. These include the Ways of Responding questionnaire (Barber & DeRubeis, 1992), the Performance of CT Strategies measure (Strunk et al., 2007), and the concise Skills of Cognitive Therapy measure recently developed by Jarrett, Vittengl, Clark, and Thase (2011).

METHODOLOGICAL ISSUES AND RECOMMENDATIONS FOR FUTURE YOUTH PROCESS RESEARCH

Surprisingly, studies investigating theoretically important psychotherapy ingredients frequently yield

process-outcome correlations that are considered small and account for a relatively small proportion of symptom change (e.g., see Horvath et al., 2011, alliance-outcome meta-analysis; Webb et al., 2010, adherence-outcome and competence-outcome meta-analysis). One interpretation of such findings is that variables such as therapist adherence/competence play a relatively small role in contributing to patient symptom improvement. However, there are a number of methodological features associated with these studies that can attenuate underlying process-outcome associations. We highlight some of these features next and offer recommendations for future youth process research.

The vast majority of studies in both the adult and youth psychotherapy literature that have yielded estimates of adherence-outcome or competence-outcome associations have involved the prediction of outcome over a relatively long period. Ratings of therapist adherence to, or competence in, treatment methods are typically obtained early in treatment and correlated with scores on outcome measures assessed several weeks or months later, typically at posttreatment, or they are correlated with change in symptoms from pretreatment, or early in treatment, to that later time. Consequently, the strength of the association between therapist interventions and patient outcome may be diluted due to processes that occur in the intervening period. In most studies, the time lag between the assessments of the adherence/competence and outcome may be too long to capture the short-term impact of therapist techniques on patient symptom improvement. It may be that stronger associations will be obtained when researchers test the relation between adherence, or competence, and short-term outcome (e.g., predicting session-to-session symptom improvement). Indeed, Strunk, Brotman, and DeRubeis (2009) reported that therapist adherence to concrete, symptom-focused CT methods predicted short-term, but not long-term, outcome.

The timing of assessments is also critical in studies investigating cognitive mediation. Pre-post designs are common in studies of cognitive change in adult and youth CBT. As noted earlier, at best such studies can reveal that significant changes in cognitive constructs and outcome have occurred over the course of treatment and that changes in these variables covary with one another. Temporal order cannot be established using such an assessment schedule. Pre-mid-post designs (e.g., DeRubeis et al., 1990; Kolko et al., 2000) are preferred to pre-post designs for controlling for temporal confounds and testing mediation but are also, in most cases, not ideal. More specifically, the results of mediation analyses based on such designs may underestimate underlying effects if they fail to adequately capture the time frame of causal relations between changes in cognitions and improvement in patient

outcome (Collins & Graham, 2002; Laurenceau et al., 2007). It will be important for future CBT process studies to consider assessment schedules carefully, with an emphasis on maximizing the likelihood of capturing underlying causal relations between putative mediators, including changes in negative cognitions, and outcome variables of interest (Kraemer, Wilson, Fairburn, & Agras, 2002; Laurenceau et al., 2007). If cognitions or outcome variables are assessed too early (e.g., prior to the patient sample exhibiting enough cognitive change for there to be sufficient variability in cognitions) or too late (e.g., after the bulk of depressive symptom change has already occurred in the sample), effect size estimates of the association between measures of cognitions and outcome will likely be attenuated. Ideally, the timing of assessments of putative mediators and outcome variables should be informed by prior research, pilot data, and theories regarding the time frame of causal relations (Collins & Graham, 2002; Laurenceau et al., 2007).

With respect to associations between cognitions and patient outcome, the time lag of causal relations likely varies as a function of the particular cognitive constructs and outcome variables being examined (e.g., shifts in depressed mood vs. measures of the broader syndrome of clinical depression, or occupational or interpersonal functioning). The time lag between changes in depressogenic cognitions and improvements in negative affect, for example, may be quite short (e.g., milliseconds), posing a particular challenge for process researchers who aim to capture such brief causal relations. Complicating matters further is the fact that cognitive changes are not synchronized across patients but rather are likely to occur at a variety of different time points over the course of treatment. One arguably prudent, albeit more time-intensive, approach to maximizing the chance of capturing underlying causal relations is to assess negative cognitions, as well as other putative mediators, and outcome variables more frequently during the course of treatment (e.g., on a session-by-session basis; Kraemer et al., 2002; Laurenceau et al., 2007).

Alternatively, and in contrast to the between-subjects methodology just described, cognitive change can be examined idiographically. For example, rather than specifying particular time points at which cognitions and outcome will be measured for all patients, assessment points can be anchored within subjects. Research on the phenomenon of "sudden gains" (i.e., a sudden and substantial improvement in symptoms during treatment) has shown promise as an idiographic approach to examining the link between changes in cognitions and improvements in depressive symptoms in CBT for depression in adults (Tang & DeRubeis, 1999). Tang and his colleagues (Tang & DeRubeis, 1999; Tang et al., 2005) found that patients experienced

substantial cognitive changes in the therapy session preceding the sudden gain (i.e., the pregain session), but relatively little cognitive change in a control session. Given evidence of the occurrence, and therapeutic benefit, of sudden gains among depressed adolescents in psychotherapy (e.g., Gaynor et al., 2003), the idiographic approach to examining the association between cognitive change and symptom improvement may also yield fruitful findings in adolescent process research. Moreover, rather than anchoring process investigations around sudden and substantial improvements in symptoms (sudden gains), researchers can use marked changes in mediators (e.g., critical incidents) as entry points. For example, for each patient, researchers could locate substantial changes in cognition and compare effects on outcome, relative to periods with no or little shift in cognitions.

In addition, studies of adherence and competence typically examine the association between mean scores on measures assessing a variety of techniques/methods and treatment outcome. It may be that only some of these interventions significantly predict symptom improvement, but their relation with outcome is masked by virtue of being pooled with a range of items assessing therapy elements exerting little or no influence on outcomes. Therefore, future adherence/competence-outcome studies of CBT for youth depression would benefit from examining whether particular items, or clusters of items, assessing certain therapist interventions are relatively strongly associated with depressive symptom change (see DeRubeis & Feeley, 1990; Feeley et al., 1999).

The limited reliability of process and outcome measures may also serve to attenuate process-outcome associations, as well as restrictions in the ranges of these variables. Indeed, in many of the studies reviewed in the aforementioned meta-analysis of adherence-outcome and competence-outcome relations (Webb et al., 2010), great care was taken in selecting and/or training therapists, as well as supervising the quality of the implementation of the psychotherapies under investigation. To the extent that such features resulted in a restriction in the range of adherence and competence (i.e., few, if any, adherence and competence scores in the lower end of the distribution), then the observed process-outcome effect size estimates would be expected to be underestimates of the effects in the broader population of therapists.

Therapist *responsiveness* may also help account for the failure of many process studies to find significant associations between seemingly important therapy elements and outcome. Responsiveness refers to the fact that therapists generally do not deliver predetermined levels of particular interventions but rather are *responsive* to the emerging context in therapy, including patient

behaviors and severity and types of symptoms (Stiles, Honos-Webb, & Surko, 1998). For example, one can imagine a therapist delivering particular interventions more frequently or intensively (reflected in higher adherence ratings) with a patient who has exhibited little or no symptom change and is therefore at high risk of evidencing poor outcome by the end of treatment. The presence of enough such patients (high adherence yet relatively poor outcomes) could result in small or even negative associations between adherence to interventions and outcome. Thus, a small or negative process-outcome correlation does not necessarily impugn the clinical importance of a therapy component.

Moreover, it is important to recognize that some patients may exhibit similarly high levels of symptom improvement regardless of the levels of therapist interventions (e.g., “spontaneous remitters”), whereas some particularly challenging patients (at least for that treatment modality or therapist) may fail to improve regardless of the levels of therapist interventions. To the extent that a given sample contains many such patients, associations between therapist adherence to interventions and variability in outcome will be attenuated.

A growing body of outcome research supports the general efficacy of CBT for adolescent depression. However, the mechanisms of depressive symptom change in CBT are not yet clear. More appropriately designed studies are needed to better address the role of process variables in contributing to depressive symptom change (e.g., experimental studies in which one process variable is manipulated while attempting to hold all others constant, and patients are randomly assigned to conditions). In addition, it will be important to investigate the mechanisms of change in CBT across different therapy formats (e.g., individual, group, family, bibliotherapy, computerized). Group formats, for example, are commonly used in treatment studies involving depressed adolescents. Relative to individual therapy, group treatment may be particularly helpful at normalizing the experience of depression (i.e., participants seeing firsthand that they are not alone and that other adolescents have similar experiences with depression). This process of normalization may be particularly beneficial to depressed adolescents if they are less likely than adults to recognize that some of their peers also struggle with the disorder. In addition, group formats also provide unique opportunities for in vivo practice of interpersonal skills with the other adolescents in the group. Group therapy also poses unique challenges for process researchers as there are more than two individuals interacting with one another in the room. Issues that arise include the problem of conceptualizing and assessing the therapeutic alliance when there is more than a single dyadic therapist–patient relationship involved.

The field of youth CBT process research is relatively new. Given the substantial gaps in the literature and the aforementioned methodological limitations of existing studies, it is difficult to make meaningful recommendations for CBT practice based on the available youth process research. However, the results of well-designed future process studies may yield findings that have important implications for the refinement of CBT protocols, therapist training, and clinical practice. A better understanding of the active therapeutic ingredients and mechanisms of successful CBT with depressed adolescents may ultimately lead to the development of more effective and efficient CBT interventions tailored for depressed youth. For example, the findings from future research may highlight helpful strategies to develop and maintain a strong therapeutic alliance with depressed adolescents, promote engagement in treatment and homework compliance, reduce the risk of dropout, or suggest ways to help adolescent clients identify and challenge depressogenic cognitions and maladaptive information processing (e.g., related to peer or parental stressors).

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