Examing the Relation Between the Therapeutic Alliance, Treatment Adherence, and Outcome of Cognitive Behavioral Therapy for Children With Anxiety Disorders

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Little is known about the contribution of technical and relational factors to child outcomes in cognitive behavioral therapy (CBT) for children with anxiety disorders. This study investigated the association between treatment adherence, the child-therapist alliance, and child clinical outcomes in manual-guided individual- and group-based CBT for youths diagnosed with anxiety disorders. Trained observers rated tapes of therapy sessions for treatment adherence and child-therapist alliance in a sample of 52 children (aged 8 to 12) with anxiety disorders. Self-reported child anxiety was assessed at pre-, mid-, and posttreatment; parent-reported child internalizing symptoms was assessed at pre- and posttreatment. The results showed high levels of treatment adherence and child-therapist alliance in both CBT programs. Neither treatment adherence nor child-therapist alliance predicted traditional measurements of child outcomes in the present study, but a relation between alliance and outcome was found using a more precise estimation of the true pre-post differences. Implications of these findings for expanding our understanding of how treatment processes relate to child outcome in CBT for children with anxiety disorders are discussed.

REVIEWS OF THE CHILD and adolescent psychotherapy literature consistently identify cognitive-behavioral therapy (CBT) as an efficacious intervention for youths with anxiety disorders (see Ollendick & King, 1998, 2000). Despite evidence in support of the efficacy of CBT for youths with anxiety, 20% to 60% of children continue to meet criteria for an anxiety disorder after receiving a full course of CBT (Cartwright-Hatton, Roberts, Chitsabesan,
process and outcome in CBT for child anxiety

Fothergill, & Harrington, 2004; In-Albon & Schneider, 2007). Identifying ways to optimize the delivery of CBT for youths with anxiety and improve the response rate therefore represent important goals for the field. Though treatment processes, such as the therapeutic child-therapist alliance (hereafter referred to as the child alliance), are hypothesized to promote positive child outcomes, little is known about the role such processes play in CBT for children with anxiety disorders (Chu et al., 2004; Kendall & Ollendick, 2004). This represents an important gap in the field. The goal of the present paper is to address this knowledge gap by evaluating the contribution of the child alliance and treatment adherence to outcome in CBT for children with anxiety disorders.

The child alliance is considered an important relational factor in child psychotherapy (Shirk & Karver, 2003). It is defined as the therapist’s ability to develop a warm relationship and engage the child in the therapeutic process (McLeod & Weisz, 2005). A strong child alliance is believed to be important for child outcomes by helping to maximize child participation in treatment (McLeod & Weisz; Shirk & Saiz, 1992).

A strong child alliance is also believed to help promote positive outcomes in CBT for youths with anxiety (Chu et al., 2004). There are at least two ways in which the child alliance might help produce positive outcomes in CBT for youths with anxiety. First, a strong child alliance may help maximize child involvement in the skill-building components of CBT that depend upon child participation for success (Chu & Kendall, 2004). Second, a child-therapist relationship marked by trust may help children more fully participate in emotionally demanding exposure tasks (Kendall & Ollendick, 2004). A strong child alliance is therefore hypothesized to play a facilitative role in CBT for youths with anxiety disorders.

However, though the child alliance is posited to be instrumental in promoting change in CBT for children with anxiety disorders, a conclusive link between child alliance and outcome has not been established. To date, the three studies that have examined the child alliance–outcome association in CBT for children with anxiety disorders have not found a significant association (Chiu, McLeod, Har, & Wood, 2009; Kendall, 1994; Kendall et al. 1997). Though some authors have stated that limited variability in the child alliance ratings may explain the null findings (see Chu et al., 2004, for a discussion), no empirical evidence exists linking child alliance to child outcomes in CBT for youths with anxiety. As a result, the question of whether the child alliance is associated with clinical outcomes in CBT for youths with anxiety disorders remains open. A goal of the present study is to address this gap.

Therapeutic interventions are also considered critical change agents in CBT for children with anxiety disorders (Shadish & Sweeney, 1991). If the technical aspects of CBT do represent change agents, then the level of therapist adherence to the treatment protocol should predict youth outcomes. Adherence checks can be used to assess variability in treatment (e.g., treatment dosage), thus creating the means to examine intervention-outcome relations (Doss & Atkins, 2006). Higher dosages of therapeutic interventions are expected to result in improved treatment outcomes. However, to our knowledge, no study has evaluated the relation between treatment adherence and child outcomes in CBT for youths with anxiety. In the present study, we evaluate the relation between therapist adherence and child clinical outcomes in CBT for children with anxiety disorders.

Evaluating technical and relational elements at the same time provides the opportunity to address an important issue in the field. Some clinicians assert that the use of manualized treatments negatively affects the client-therapist alliance (Addis, Wade, & Hatgis, 1999; Strupp & Anderson, 1997). However, this assertion has not received empirical support in adult psychotherapy. For example, Loeb and colleagues (2005) reported a positive relation between alliance and treatment adherence in manualized treatments for adult bulimia, suggesting that adhering to a treatment manual does not negatively influence the therapeutic alliance. This hypothesis has not, however, been subjected to empirical scrutiny in the child field. We therefore evaluated the relation between adherence and child alliance in CBT for youths with anxiety.

A few methodological features are particularly important when assessing process-outcome associations. First, establishing the temporal precedence of process variables by assessing process variables prior to outcome is important (Feeley, DeRubeis, & Gelfand, 1999). Second, since child- and parent-report of process variables may be subject to demand characteristics, it is important to utilize independent evaluators’ ratings of actual therapy sessions (McLeod & Weisz, 2005; Shirk & Karver, 2003). Thus, in the present study we used observer-rated measures of child alliance and treatment adherence. Finally, a unique feature of the present study is that both treatment processes and outcomes were assessed multiple times throughout treatment. Assessing treatment processes and outcomes at multiple points in treatment allows re-
searchers to assess whether the strength of process-outcome relations varies across treatment. Some findings suggest that the strength of the alliance-outcome may increase as treatment unfolds (Shirk & Karver), though few studies have addressed this issue in child psychotherapy. Employing these methodological features can enhance the interpretability of findings and advance knowledge regarding the role of treatment processes in CBT for child anxiety.

The present study aimed to examine the relative contribution of relational and technical aspects of treatment to outcome in CBT for child anxiety. To achieve this goal, treatment adherence and child alliance were assessed in a sample of 52 children with anxiety disorders who received individual- and group-based CBT in a randomized controlled trial. We hypothesized that a strong child alliance and high treatment adherence would predict improved outcomes.

**Method**

**SOURCE**

A randomized multisite trial was conducted at two university-based centers in the Netherlands comparing group-based CBT (GCBT) and individual CBT (ICBT) for childhood anxiety disorders. One-hundred thirty-three children (aged 8–12) were randomly assigned in blocks of six to GCBT (n=62) or ICBT (n=65); six children could not be randomized and were excluded. Treatment lasted 14 weeks and consisted of 14 sessions (10 child, 4 parent). Exclusion criteria included an IQ below 85, psychosis, obsessive-compulsive disorder, posttraumatic stress disorder, or current medication for anxiety. Among treatment completers, 45.2% (GCBT 39%, n=23; ICBT 51%, n=33) were free of any anxiety disorder at posttreatment, and 58.9% (GCBT 53%, n=31; ICBT 65%, n=42) were free of their primary anxiety disorder at posttreatment. No differences in posttreatment status or outcomes between ICBT and GCBT were found (Liber, Van Widenfelt, Utens, et al., 2008). A description of the study design and findings are reported elsewhere (see Liber, Van Widenfelt, Utens, et al., 2008).

**PARTICIPANTS**

**Child Participants**

Participants were children with a primary diagnosis of separation anxiety disorder (SAD), generalized anxiety disorder (GAD), social phobia (SOP), or specific phobia (SP). Of the 142 children invited to participate, 133 signed informed consent, and 124 completed treatment. Permission to videotape the sessions was obtained for 119 of the 124 treatment completers, and a subset of these children (n=52) was selected for the present study. To be considered for inclusion, participants had to have (a) audible videotapes (n=119), (b) pre-, mid-, and posttreatment outcome data (n=113), and (c) the same session from early and late treatment coded with treatment adherence and child alliance.1

The 52 children (30 males, 22 females) averaged 10.22 years of age (SD=1.15, range 8–12), were Dutch (Caucasian), with a current primary diagnosis of SAD (n=20), GAD (n=15), SOP (n=10), or SP (n=7). Of the 52 child participants, 8 were diagnosed with at least one comorbid disorder other than anxiety (attention-deficit/hyperactivity disorder, n=6; oppositional-defiant disorder, n=2; dysthymia, n=1; major depressive disorder, n=1). According to the criteria of the Central Bureau of Statistics Netherlands (2001), the socioeconomic status was low for 6 children, medium for 25 children, and high for 21 children.

**Therapist Participants**

Therapists (n=16) participating in this study were all Caucasian. Six children were treated by master-level students (n=5), 13 children were treated by licensed psychologists (n=6) with 1 to 5 years experience, and 33 children were treated by licensed psychologists (n=5) with over 5 years of clinical experience. Prior to the start of the study, all participating therapists met to discuss the protocol. Therapists met weekly and were supervised by two licensed psychologists with experience in CBT. The average number of treated cases per therapist was 3.25 (SD=2.74, range 1–9). All sessions were videotaped; therapists were not aware of which sessions were selected for coding.

1 In all, 117 child participants had therapy sessions coded for treatment adherence and child alliance. However, coding was done separately for treatment adherence and child alliance. Sessions were randomly sampled for treatment adherence coding prior to the start of the study in order to produce treatment integrity data for the clinical trial (see Liber, Van Widenfelt, Utens, et al., 2008). Child alliance coding was conducted following completion of the clinical trial, but fewer sessions were coded for alliance compared to adherence. Therefore, not all participants had the same sessions coded for both treatment adherence and child alliance. For the present study, we decided to restrict the current sample to child participants who had the same early and late therapy sessions coded with treatment adherence and child alliance ratings because the goal of the study was to assess the relative contribution of technical and relational factors to child outcome. Requiring that each session was coded with both systems helps ensure that the order in which sessions were coded did not account for study findings—minimizing the confound between process variables and improvement in symptomatology over treatment (Feeley et al., 1999).
Coders
The coding team was trained and supervised by the first and fifth authors and consisted of six female master-level graduate students in clinical psychology and the first and fifth authors. Six coders participated in adherence coding, and five coders participated in child alliance coding. Three of the coders rated both alliance and adherence.2

TREATMENTS
Both GCBT and ICBT were guided by a treatment manual—the Dutch translation of the FRIENDS program (Barrett & Turner, 2000; Utens, De Nijs, & Ferdinand, 2001)—based upon the Coping Cat program (Kendall, Kane, Howard, & Siqueland, 1990). The FRIENDS program involves: (a) teaching children to identify anxious feelings and physiological signs of anxiety; (b) teaching children to identify their own anxiety-provoking cognitions; (c) developing a plan to guide coping—a plan that involves changing the child’s thoughts (into positive self-talk) and actions (into self-initiated exposures); and (d) self-evaluation and self-reward. The therapist uses modeling (e.g., therapist sharing successful coping experiences), in vivo exposure tasks, role-playing (e.g., to prepare for exposure tasks), relaxation training, and contingent reinforcement (e.g., for trying and for succeeding at exposure tasks), in developing these themes.

The main difference between GCBT and ICBT was session length and format. Treatment duration was approximately 90 minutes in GCBT and approximately 60 minutes in ICBT. The treatment format differed; GCBT had two therapists and four to six children in each session, whereas ICBT had one therapist and one child.

ASSESSMENT PROCEDURE
Children completed assessments on four occasions: (a) two pretreatment assessments (Time 0 = at least 2 weeks prior to start of the treatment; Time 1 = start of the treatment); (b) a midtreatment assessment 1 week after the fifth child session (Time 2); and (c) posttreatment assessment (Time 3; approximately 1 week posttreatment). Parent-report assessments were obtained at Time 0 or 1 and Time 3; child-report assessments were obtained at Time 0, 1, 2 and 3. Assessments took approximately 30 to 90 minutes for children and parents separately. Upon treatment completion, children received a gift coupon.

MEASURES
Clinical Outcomes
Children’s DSM-IV disorders were assessed using the Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Versions (ADIS-C/P; Silverman & Albano, 1996), a semistructured interview schedule with favorable psychometric properties (Silverman, Saavedra, & Pina, 2001). A Dutch translation of the ADIS-C/P (Siebelink & Treffers, 2001) was made in consultation with the first author (Silverman). The ADIS-C/P was administered to children and parents at Times 0 and 3. Procedures for interviewer training are reported elsewhere (Liber, Van der Leeden, Sauter, & Treffers, 2007; Liber, Van Widenfelt, Goedhart, et al., 2008).

Children completed the Multidimensional Anxiety Scale for Children (MASC; March, 1997; March, Sullivan, & Parker, 1999), a 39-item measure of self-reported child anxiety. A translation of the MASC by Utens and Ferdinand (2000) was used to generate Dutch normative data (N = 299, age 8–12). Reliability analyses conducted on the sample collected by Utens and Ferdinand revealed an excellent alpha (α = .93) and good test-retest reliability (r = .81, n = 196, age 8–12). The MASC was administered at Times 0, 1, 2 and 3. The MASC total score was used for analyses.

The Child Behavior Checklist (CBCL) consists of 113 items and is a parent-report measure that assesses a wide range of child emotional and behavior problems with sound psychometric properties (Achenbach & Rescorla, 2001). A Dutch translation of the CBCL was used for the present study (Verhulst, 2002). The CBCL Internalizing scale (CBCL-Int) was used for the present study. The CBCL was administered at Times 0 or 1 and 3.

THERAPY PROCESS MEASURES
 Therapeutic Alliance
The Therapy Process Observational Coding System for Child Psychotherapy–Alliance scale (TPOCS-A; McLeod, 2005; McLeod & Weisz, 2005) was designed to assess child- and parent-therapist alliance in child psychotherapy. The TPOCS-A consists of items designed to assess affective elements of the client-therapist relationship (6 items), as well as
client participation in therapeutic activities (3 items). For the present study, the TPOCS-A was translated into Dutch and used to measure the quality of the child alliance in ICBT and GCBT (see Liber et al., 2007). In previous studies, including one reporting upon the development and validation of the TPOCS-A, the measure demonstrated adequate interrater reliability, internal consistency, and convergent validity (see Chiu et al., 2009; McLeod & Weisz, 2005), as has the Dutch version (see Liber et al.).

The TPOCS-A was originally designed to assess child- and/or parent-therapist alliance in individual, family, or parent-focused sessions. The scoring strategy involves coders watching entire therapy sessions and then rating each item on a 6-point scale ranging from 0 (not at all) to 5 (a great deal) for the child- and parent-therapist alliance (i.e., coders fill out separate TPOCS-A forms for the child- and parent-therapist alliance). This scoring strategy was adapted slightly for use in assessing child alliance in group-based therapy. For the GCBT sessions, coders were instructed to watch an entire session and then fill out a separate TPOCS-A codesheet based upon the relationship between the target child and the therapist and co-therapist. Coders were instructed to focus specifically upon the behavior of the target child and the quality of his/her interactions with the therapist. For the present study, we focused upon the quality of the alliance between the child and the main therapist since the main therapist played a more prominent role in the group sessions compared to the cotherapist who played a more facilitative role.

Treatment Adherence
The Australian treatment adherence protocol for the FRIENDS treatment (Barrett, 1999) was translated into Dutch (see Utens, Liber, & Van der Leeden, 2002). The coding system was designed to assess the extent to which therapists delivered the therapeutic exercises prescribed in the treatment manual. Each session contained 6 to 12 therapeutic exercises, which represent CBT techniques (e.g., cognitive restructuring, relaxation exercises). An example of an activity was “Practicing Your Step Plan,” with the aim “to help participants practice the second step of their step plan in preparation for implementing the step outside the group/treatment environment.” Coders watched entire therapy sessions and then rated how well the therapist met the aims of each activity on a 4-point Likert-type scale (1 = extremely well to 4 = not at all). For analytic purposes, scores for each session activity were reverse scored, added together, and then divided by the number of session activities in order to produce a score ranging from 0.00 to 3.00. Reverse scoring was conducted in order to match the interpretation of the adherence scores to the interpretation of alliance scoring (higher scores reflect better adherence and a stronger child alliance).

Coding and Session Sampling Procedures
To ensure that coders were properly trained, and to minimize rater drift (Margolin et al., 1998), the following procedures were employed to generate scores on the child alliance and adherence measures.

Coder Training
Training for the TPOCS-A included studying the original and translated TPOCS-A coding manuals and reviewing relevant literature. During training, coders rated the same tapes and discussed differences until consensus was reached. After sufficient interrater reliability was obtained, independent coding commenced (see Liber et al., 2007). Weekly meetings were held with both teams to monitor coding and prevent rater drift (see Margolin et al., 1998). In the weekly meeting, a session that had been double-coded was discussed to prevent rater drift; coding disagreements were discussed until consensus was achieved. Eight of the 52 (15%) early alliance sessions and 10 of the 52 (19%) late alliance sessions in the present sample were double coded.

Coder training for the adherence measure consisted of reading the coding manual and related literature, practicing coding, and attending weekly coder meetings. The coders coded 14 practice sessions that were consensus-coded by the first and fifth authors. Coder scores on these practice sessions were compared to those generated by the first and fifth authors. Independent coding commenced once coders obtained acceptable interrater agreement (Yules Y ≥ .55; Spitznagel & Helzer, 1985).

Sampling of Therapy Sessions
For coding, taped therapy sessions were randomly sampled from the first (early) and second (late) half of treatment. When a tape was not available, the subsequent or preceding session was used. Child alliance and adherence ratings were coded from the same therapy session; 104 sessions were coded (52 early sessions: sampled sessions ranged from 1–4, Median = 3; 52 late sessions: sampled sessions ranged from 7–10, Median = 8).

Overview of Data-Analytic Procedures
Treatment Recovery and Reliable Change
Treatment recovery or failure was determined by posttreatment diagnostic status (presence [1] or
absence [0] of any anxiety disorder) as assessed with the ADIS-C/P and by Clinically Significant Change Indices (CS index). The CS index and the Reliable Change scores (RC scores) were computed from the pre- and posttreatment scores on the CBCL-Int and the MASC (see Hageman & Arrindell, 1999a). For questionnaire measures, individual reliable change and clinically significant change are the methods of choice to describe pre- to post-treatment change since comparing pre- and posttreatment scores cannot indicate whether clinically significant change was obtained (Wise, 2004). RC scores were used because they represent the most precise estimation of the true pre-post differences and are a more conservative approach than using the observed difference score (for a detailed description see Liber, Van Wildenfelt, Goedhart, et al., 2008). Negative RC scores reflect a reliable reduction in symptoms.

The RC score can be transformed into three categories (RCIND index): (a) improved (RC score ≤ −1.65); (b) not reliably changed (−1.65 ≤ RC score ≤ 1.65); and (c) deteriorated (RC score > 1.65). A client whose RC score indicates improvement and whose post-score on the outcome measure is passing the cutoff for “normal” functioning is considered to have “recovered” or to show a clinically significant change. In the present study, the CS index is a dichotomy of “recovered” versus “not/partially recovered.” To determine which clients have reliably passed the cutoff for “normal functioning,” the CSINDIV score was computed (using cutoff type c). A CSINDIV score <−1.65 is used to conclude that the individual client has passed the cutoff for “normal” functioning. A lower score indicates more “normal” functioning with all outcome measures used in this study.

The CS indexes from fathers and mothers were combined: if the pre- and posttreatment CBCL-Int scores of either parent resulted in a CS index of “recovered,” the outcome was considered successful unless the RC score of the other parent was >1.65 (“deteriorated”). The CS of the CBCL Int scores for mothers and fathers showed a correlation of .67 (p<.001).

Estimated Power
An a priori estimation of the necessary sample size for regression analyses with two predictors showed a necessary sample of 55 respondents for a main effect, $f^2 = 0.15$, alpha = .05, power = .80, critical $F(1, 51) = 4.03$. Similar indices (sample = 52, alpha = .05, $f^2 = 0.13$) used with post hoc power calculations indicated an expected power of .78 for regression analyses with three predictors (Erdelder, Faul, & Buchner, 1996). Note that Cohen (1988) considered $f^2 = .02, .15$, and .35 as small, medium, and large effect sizes, respectively.

Data Analytic Approach
Data analyses were conducted using a stepped approach. First, preliminary analyses were conducted to determine whether the selected sample differed from the original sample. Second, we assessed the psychometric properties of the child alliance and adherence measures. Third, associations between child alliance and adherence were assessed. Fourth, prediction of treatment outcome was assessed using three different approaches: (a) regression analyses with posttreatment scores as dependent variables and pretreatment scores as predictors to correct for symptom severity; (b) logistic regression with treatment recovery on the ADIS-C/P, MASC and CBCL as dependent variables; and (c) regression analyses with RC in self-reported anxiety symptoms and parent-reported internalizing symptoms as dependent variables. For all three methods child alliance, adherence and interactions with treatment format were entered as predictors. Fourth, we examined whether alliance and adherence interacted to predict differential outcomes. For these analyses, child alliance, adherence, and the Alliance x Adherence interaction were entered as predictors. Fifth, a series of regressions were used to examine whether shifts in the alliance and/or adherence predicted posttreatment outcomes by regressing posttreatment outcomes on shifts in the alliance and adherence as represented by change scores between early and late alliance and adherence scores. Last, to facilitate comparisons between our findings and previous studies, product-moment correlations between the early and late process variables (i.e., adherence, alliance) and mid- and posttreatment outcomes were calculated.

Results
PRELIMINARY ANALYSES
Comparison of Present Sample Versus Original Sample
The present sample (n = 52) did not differ significantly from the original sample (n = 133) in demographic or clinical characteristics (e.g., age, gender, principal diagnosis, SES). In the original study, the ICBT and GCBT conditions did not differ in demographic or clinical characteristics; however, in the present study children in the GCBT condition were younger ($M=9.80, SD=1.07$; $M=10.72$, 177
Treatment Outcome

At posttreatment, 13 children in the ICBT condition (54%) and 12 children in the GCBT condition (43%) no longer met criteria for any anxiety disorder. In both the ICBT and GCBT, 18 children no longer met criteria for their primary disorder (ICBT 75%, GCBT 64%). Recovery on the MASC was obtained by 8 of 24 children in ICBT and 12 of 28 in GCBT (ICBT 33%, GCBT 43%); recovery on the CBCL-Int was obtained for 4 of 24 children in ICBT and 5 of 28 children in GCBT (ICBT 17%, GCBT 18%). There were no significant differences in outcome between ICBT and GCBT. Success rates were not significantly different in the selected sample compared to the original sample (ADIS-C/P; \( \chi^2 = .01, p = \text{ns} \); MASC recovery; \( \chi^2 = .01, p = \text{ns} \); CBCL-Int recovery; \( \chi^2 = .34, p = \text{ns} \)).

PSYCHOMETRIC PROPERTIES OF THE THERAPY PROCESS MEASURES

Interrater reliability for the Dutch version of the TPOCS-A was calculated using intraclass correlation coefficients (ICC; Shrout & Fleiss, 1979). Following Cicchetti (1994), ICCs below .40 reflect "poor" agreement, ICCs from .40 to .59 reflect "fair" agreement, ICCs from .60 to .74 reflect "good" agreement, and ICCs .75 and higher reflect "excellent" agreement. Interrater reliability was excellent at the scale level (.81), and it was fair when calculated at the item level (M = .48, SD = .06; range .42–.59). Interrater reliability of the TPOCS-A scale was comparable to the reliability reported in past observational studies of treatment alliance (e.g., Faw et al., 2003; Hogue, Dauber, Stambaugh, Cecero, & Liddle, 2006) in child psychotherapy. Next, we assessed the internal consistency of the TPOCS-A. The internal consistency was acceptable for the total (\( \alpha = .92 \)), early (\( \alpha = .83 \)), and late (\( \alpha = .81 \)) child alliance scores. In sum, the psychometric properties of the Dutch version of the TPOCS-A were adequate (see Liber et al., 2007).

Interrater reliability for the treatment adherence protocol was calculated using Yule’s Y, as this index is less sensitive to skewed distributions (Spitznagel & Helzer, 1985). The interpretation of Y is similar to kappa. Following Fleiss (1981), kappas below .40 reflect "poor" agreement, kappas between .40 and .74 reflect "fair to good" agreement, and kappas .75 and higher reflect "excellent" agreement. The Y scores at the start of independent scoring ranged from .55 to .73 for the five coders (M = .68, SD = .08). In sum, the psychometric properties of the treatment adherence protocol were adequate.

DESCRIPTIVE ANALYSES OF ALLIANCE AND ADHERENCE

The means and standard deviations for child alliance and treatment adherence are reported in Table 1. The distribution of alliance scores had a skew of −1.08 (SE = 0.33), and two outliers were identified (i.e., outliers were defined as \( z > 1.96 \)). The distribution of adherence scores had a skew of −0.91 (SE = 0.33), and two outliers were identified (\( z > 1.96 \)).

Next, correlations between child alliance and adherence were computed for each treatment stage (early, late) and each treatment group (see Table 2). Variance shared between the two variables ranged from .01 (GCBT) to .19 (ICBT) for the early sessions and from .03 (GCBT) to .20 (ICBT) for the late sessions. The correlation between late child alliance and late adherence was significantly different between the ICBT and GCBT condition (\( z = 2.26, p < .05 \)), and a trend was found for a significant difference between conditions with

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**Table 1**

Means and Standard Deviations for ICBT, GCBT: Early and Late Alliance and Adherence

<table>
<thead>
<tr>
<th></th>
<th>ICBT Mean</th>
<th>ICBT SD</th>
<th>GCBT Mean</th>
<th>GCBT SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early</td>
<td>3.79</td>
<td>0.70</td>
<td>3.61</td>
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</tr>
<tr>
<td>Late</td>
<td>3.99</td>
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<td>3.66</td>
<td>0.57</td>
</tr>
<tr>
<td>Adherence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early</td>
<td>2.81</td>
<td>0.23</td>
<td>2.82</td>
<td>0.14</td>
</tr>
<tr>
<td>Late</td>
<td>2.48</td>
<td>0.43</td>
<td>2.65</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Note. ICBT = individual CBT; GCBT = group-based CBT.

**Table 2**

Correlations (and Shared Variance) Between Alliance and Adherence by Treatment Stage and Treatment Condition

<table>
<thead>
<tr>
<th></th>
<th>GCBT</th>
<th>ICBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Adherence x Early Alliance</td>
<td>( -.07 ) (0.01)</td>
<td>( .44^* ) (0.19)</td>
</tr>
<tr>
<td>Late Adherence x Late Alliance</td>
<td>( -.18 ) (0.03)</td>
<td>( .45^* ) (0.20)</td>
</tr>
</tbody>
</table>

Note. ICBT = individual CBT; GCBT = group-based CBT. \( p < .05 \).

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3 Since child age was significantly different between the ICBT and GCBT conditions we reran all analyses and entered age as a covariate. With child age entered as a covariate, none of the results changed.

4 Analyses were re-run with the outliers removed, and all findings remained the same except that the interaction effect was reduced to a trend (\( p = .05 \)).
regard to early child alliance and adherence ($z = 1.85, p < .10$).

**TREATMENT ADHERENCE AND ALLIANCE IN ICBT AND GCBT**

To examine the levels of adherence and child alliance across sessions, we conducted two separate $2 \times 2$ (treatment by session) analyses of variance (ANOVAs) with repeated measures on session. The results for adherence were nonsignificant, $F(1, 50) = 1.81, ns$. The results for the treatment by session repeated measures ANOVA was nonsignificant for child alliance, $F(1, 50) = 3.26, ns$. Together, the findings indicate that, across both conditions, child alliance and treatment adherence were high. See Table 1 for descriptive data.

**PREDICTION OF TREATMENT OUTCOME WITH ALLIANCE AND ADHERENCE**

We examined relations between the child alliance and adherence ratings and outcome in a series of regression analyses (see Table 3). Each case contributed two alliance and adherence observations— one session “early” in treatment and one session “late” in treatment. From these observations, TPOCS-A scores were produced by calculating the mean score for the early and late sessions ($r = .37, p < .01$). The same procedures were used to generate an adherence score ($r = .15, p = ns$). We calculated a single alliance and adherence score by averaging ratings from two sessions to produce a more reliable estimate than from only one observation (Kazdin, Whitley, & Maricano, 2006). For each regression analysis, we first entered the mean child alliance and adherence ratings, treatment format (GCBT vs. ICBT), and prescores on the outcome measure (to control for initial severity). In the second step, interaction effects were entered (Treatment Format × Child Alliance; Treatment Format × Adherence).

We found no significant relations between the child alliance or adherence and child-report of anxiety (MASC Time 3) and no interaction effects. We also found no significant relation between child alliance or adherence and parent-reported internalizing symptoms (CBCL-Int Time 3) and no significant interaction effects. Moreover, neither child alliance nor treatment adherence accounted for a significant proportion of the variance in either outcome measure. The pretreatment scores of both the CBCL-Int and MASC contributed to the prediction of the posttreatment scores. See Table 3.

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**Table 3**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Mean Process Variables</th>
<th>$\beta$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
<th>$p &lt;$</th>
<th>Var</th>
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<tr>
<td>MASC time 3</td>
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<tr>
<td>MASC time 1</td>
<td>0.82</td>
<td>$p &lt; .001$</td>
<td>.64</td>
<td>.64</td>
<td>$&lt; .001$</td>
<td>61%</td>
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<tr>
<td>Adherence</td>
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<tr>
<td>TF</td>
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<tr>
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<tr>
<td>CBCL-Int time 3</td>
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<tr>
<td>CBCL-Int time 1</td>
<td>0.72</td>
<td>$p &lt; .001$</td>
<td>.52</td>
<td>.52</td>
<td>$&lt; .001$</td>
<td>52%</td>
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<tr>
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<td>Alliance x TF</td>
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<td>Adherence x TF</td>
<td>−0.60</td>
<td>ns</td>
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Note. MASC = Multidimensional Anxiety Scale for Children; TF = Treatment format; CBCL-Int = Child Behavior Checklist Internalizing Scale; ns = nonsignificant.

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5 We took steps to assess whether averaging alliance and adherence scores across early and late sessions influenced the alliance-outcome findings. We took this step for two reasons. First, some findings suggest that early and late alliance may be differentially associated with treatment outcome (Shirk & Karver, 2003). Second, the correlation between early and late alliance ($r = .37$) and early and late adherence ($r = .15$) were moderate to low. Entering early and late alliance and adherence did not improve the prediction models.
**Prediction of Treatment Recovery with Alliance and Adherence**

We examined relations between child alliance and adherence and treatment recovery in a series of logistic regression analyses predicting recovery (see Table 4). For each regression analysis, we entered treatment format and the mean child alliance and adherence ratings and the Treatment Format \times Child Alliance and Treatment Format \times Adherence Interaction. Neither child alliance nor adherence predicted recovery on the MASC or CBCL-Int (see Table 4); the interaction effects were not significant for either adherence or child alliance. Mean child alliance and adherence did not predict recovery on the ADIS-C/P (see Table 4), but an interaction effect was significant. Children in ICBT who did not meet diagnostic criteria for any anxiety disorder at posttreatment had significantly higher child alliance scores compared to children in GCBT, $F(3, 48) = 3.21, p < .05$. Because the previous analyses used a stringent criterion for diagnostic treatment outcome (i.e., free of any anxiety disorder), we reran the analyses using the less stringent criterion of “free of primary anxiety disorder.” No significant predictive value of alliance or adherence was found, and no interaction effect was found.

**Prediction of Reliable Change with Alliance and Adherence**

Next, child alliance, adherence, treatment format and the interactions were entered with the RC scores of the MASC and CBCL-Int as dependent variables. The resulting model showed a predictive value of child alliance for RC MASC scores, indicating that higher child alliance was related to greater symptom change. Treatment format and the interaction variables did not improve the model (see Table 5). It should be noted that the overall model did not reach significance but showed a trend. The model was marginally significant when child alliance was entered as a single predictor, $F(1, 50) = 4.03, p = .05$. The model for the CBCL-Int was not significant.
testing interaction effects: child alliance and treatment adherence

We next examined whether child alliance and treatment adherence contributed to clinical outcomes through an interaction. To test this hypothesis, we reran the three sets of outcome analyses (posttreatment scores, treatment recovery, and RC; see Tables 3–5) with alliance and adherence entered in the first step and the Child Alliance x Treatment Adherence interaction effect entered in the second step. Only the model predicting RC in anxiety symptoms improved; alliance revealed a significant effect on outcome, the alliance by adherence interaction effect did not (% variance in the RC score on the MASC explained by alliance = 10%, \( p < .05 \)). These findings suggest that within the present sample, relational and technical factors did not contribute to child clinical outcomes via an interaction.

prediction of treatment outcome from shifts in child alliance and treatment adherence

Assessing relational and technical factors early and late in treatment allowed us to examine whether changes in the process variables over the course of treatment affected child outcomes. To evaluate this question, change scores between (a) early and late alliance (early minus late; i.e., alliance shifts), and (b) early and late adherence (early minus late; i.e., adherence shifts) were calculated. Change scores revealed (a) a spread ranging from −2.56 to 1.58 for alliance with a mean overall alliance shift of −0.12 (SD = 0.71), and (b) a spread ranging from −0.39 to 1.44 for adherence with a mean overall adherence shift of 0.24 (SD = 0.40). Regressions predicting the three sets of outcome revealed no significant effects for either alliance shifts or adherence shifts. These results suggest that shifts in the relational and technical factors during therapy were not related to a reduction in symptomatology at posttreatment.

evaluating the strength of the association between alliance, adherence, and outcome

To facilitate comparisons between our findings and previous studies, effect sizes (ES) for adherence-outcome and alliance-outcome relations were estimated. ES estimates were produced by calculating product-moment correlation coefficients (\( r \)) between the early and late process variables (i.e., adherence, alliance) and mid- and posttreatment outcomes such that positive correlations indicate a stronger alliance or adherence is associated with symptom improvement. Following Cohen’s (1988) guidelines: \( r \) is a “small” effect when at least .10, a “medium” effect when at least .24, and a “large” effect when at least .37. For early alliance, the ES for midtreatment was .08 and posttreatment was .09 (SD = .11, range .03 – .12). For late alliance, the ES for posttreatment was .01 (SD = .13, range −.08 – .10). These findings indicate that in the present study the alliance-outcome association at posttreatment is weaker than ESs reported in prior research with children (\( r = .21; \) Karver et al., 2006)

| Table 5 Regression of Alliance and Adherence on Reliable Change |
|--------------------------|-----------------|------|-----|-------|------|
| Outcome                  | Mean Process Variables | \( \beta \)  | \( p \) < | \( R^2 \) | \( \Delta R^2 \) | \( p \) < |
| RC-score MASC            |                  |       |     |       |      |       |
| Step 1                   |                  |       |     |       |      |       |
| Alliance                 | 0.32             | \( p < .05 \) | .15  |       |       | 9%    |
| Adherence                | −0.26            | \( ns \)     |       |       |       | 6%    |
| TF                       | 0.04             | \( ns \)     |       |       |       | 0%    |
| Step 2                   |                  |       |     |       |      |       |
| Alliance x TF            | 1.36             | \( ns \)     | .15  |       |       | 0%    |
| Adherence x TF           | −0.28            | \( ns \)     |       |       |       | 1%    |
| RC-score CBCL Int        |                  |       |     |       |      |       |
| Step 1                   |                  |       |     |       |      |       |
| Alliance                 | 0.08             | \( ns \)     | .01  |       |       | 0%    |
| Adherence                | −0.09            | \( ns \)     |       |       |       | 1%    |
| TF                       | −0.03            | \( ns \)     |       |       |       | 0%    |
| Step 2                   |                  |       |     |       |      |       |
| Alliance x TF            | −1.62            | \( ns \)     | .07  |       |       | 4%    |
| Adherence x TF           | −1.64            | \( ns \)     |       |       |       | 1%    |

Note. MASC = Multidimensional Anxiety Scale for Children; TF = Treatment format; CBCL-Int = Child Behavior Checklist Internalizing Scale; \( ns \) = nonsignificant.
and adults (weighted \( r = .22; \) Martin, Garske, & Davis, 2000). For early adherence, the ES for midtreatment was .17 and posttreatment was .25 (SD = .21, range .10 – .39). For late adherence, the ES for posttreatment was −.10 (SD = .07, range −.05 – −.15). These findings indicate that the strength of the adherence-outcome association varied across treatment.

**Discussion**

The primary aim of the present study was to examine the contribution of relational and technical factors to outcome in CBT for youths with anxiety. Our findings indicate that both the GCBT and ICBT conditions had high child alliance ratings, consistent with findings from past randomized controlled trials evaluating CBT for youths with anxiety (Kendall, 1994; Kendall et al., 1997). We also found that treatment adherence was high across both conditions. A stronger early child alliance appeared related to better early treatment adherence in the ICBT condition, and a similar relation was found in the ICBT condition for late child alliance and late adherence. In the GCBT condition, these relations were not found. Our findings suggest that children in the ICBT condition with a strong alliance were more likely than children with a strong alliance in the GCBT condition to be free of any anxiety diagnosis at the end of treatment. However, only modest relations between child alliance, treatment adherence, and treatment outcomes were observed. These findings have both clinical and methodological implications.

Our findings regarding the relation between child alliance and outcomes were mixed. We found that a stronger child alliance was associated with greater reliable change, an index that minimizes measurement error, in child-reported anxiety symptoms. These findings run counter to two previous studies that found no significant relation between child alliance and outcome in CBT for youths with anxiety (see Kendall, 1994; Kendall et al., 1997). However, the magnitude of the early alliance-outcome association in the present study (\( r = .05 \)) is similar to past studies that found no significant alliance-outcome association in three clinical trials evaluating CBT for youths with anxiety (\( r = .12; \) Chiu et al., 2009; \( r = .00; \) Kendall, 1994; \( r = .12; \) Kendall et al., 1997; see Shirk & Karver, 2003).

Together, these findings suggest two possible interpretations. First, traditional measurement approaches may not detect the alliance-outcome relation, which is dependent on the measurement of outcome. We used three outcome measures in the alliance-outcome analyses: (a) residual change scores (i.e., analyses with posttreatment scores as dependent variable and pretreatment scores as first predictors); (b) reliable change scores; and (c) the clinical significant change index. The finding of no association between outcome and residual change scores may reflect the shortcomings of this method. Residual change scores have been criticized, as they are susceptible to considerable bias in the regression due to measurement error and the influence of atypical data points (Hageman & Arrindell, 1999b). Second, the alliance-outcome relation may be weaker in CBT for youths with anxiety compared to treatments for other child behavioral and emotional problems. Past meta-analytic findings produced by Shirk and Karver (2003) suggest that the therapeutic relationship-outcome relation may be significantly stronger in psychotherapy for children with externalizing problems (\( r = .30 \)) compared to children with internalizing problems (\( r = .10 \)). More research is required to clarify these questions.

A significant finding did emerge between the conditions. We found that a strong child alliance was associated with better diagnostic outcomes in ICBT, compared to GCBT. On the one hand, this interaction suggests that a strong child alliance may play a more important role in promoting diagnostic recovery when CBT is delivered one-on-one, compared to a group format. It is plausible that other treatment processes, such as group cohesion, may be more important in GCBT. Treatment processes, such as group cohesion, have been linked with treatment response and completion in group-delivered CBT for adults (see e.g., Hilbert et al., 2007; Taft, Murphy, King, Musser, & DeDeyn, 2003); though the same evidence has not been found in group-delivered CBT for youths (e.g., Kaufman, Rohde, Seeley, Clarke, & Stice, 2005).

On the other hand, the possibility exists that this finding is a product of methodological factors. That is, differences in coding child alliance in individual versus group therapy may account, in part, for this finding. Though our findings require replication, future studies of GCBT may increase their yield by studying treatment processes related to group dynamics.

We did not find a significant relation between treatment adherence and outcome in the present study. These results contribute to a field characterized by mixed findings. Some past studies have found significant adherence-outcome relations (e.g., Forgatch, Patterson, & Degarmo, 2005; Hogue, Dauber, Samuelis, & Liddle, 2006; Huey et al., 2004), whereas other studies have found no significant relation (e.g., Carroll, Nich, & Rouns-
Overall, however, few studies have addressed this topic, and the existing studies vary along important dimensions (e.g., type of problems, age range, focus of treatment). It therefore is difficult to draw conclusions regarding the relation between treatment adherence and outcome.

The trajectory of technical and relational factors across treatment did not predict posttreatment outcome. These findings run counter to past findings that have found a positive shift in the alliance and child involvement predicted posttreatment outcomes in CBT for youth anxiety (see Chiu et al., 2009; Chu & Kendall, 2004). Given these mixed findings, further research is needed to help clarify whether the trajectory of technical and relational elements play an instrumental role in reducing child symptomatology in CBT for child anxiety.

A few factors must be considered when interpreting our treatment adherence findings. Our measurement of treatment adherence assessed the extent to which therapists delivered the FRIENDS program as designed; however, in the present study we could not assess the relation between specific techniques and outcome. Past studies have found that specific prescribed therapeutic interventions predict child outcomes for adolescent substance abuse (see Hogue et al., 2006). It is plausible that specific therapeutic techniques in the FRIENDS program, such as in vivo exposures, may be particularly important for outcomes in CBT for youths with anxiety. Moreover, some techniques that are critical to outcome (e.g., exposure) may be more difficult to implement than others (see Chorpita, Taylor, Francis, Moffitt, & Austin, 2004; Silverman et al., 1999). So, although we did not find a relation between global treatment adherence and outcome, it is possible that an approach that assesses the extent to which specific CBT techniques are used across the course of treatment may help identify significant technique-outcome relations.

We also did not assess therapist competence or child involvement. Competence is defined as a therapist’s skill level as she/he “recognizes, considers, and responds to contextual factors surrounding the delivery of a treatment protocol” (p. 620, Waltz, Addis, Koerner, & Jacobson, 1993). This definition, sometimes called therapist flexibility (Kendall & Chu, 2000), focuses upon the competent delivery of specific prescribed interventions found in a manualized treatment. In the present study, mean treatment adherence was high in both conditions, possibly leading to a ceiling-effect; however, it is plausible that how well therapists implemented the treatments would predict clinical outcomes (Waltz et al., 1993). Level of child involvement may also predict clinical outcomes; however, we did not assess this construct. Child involvement refers to the extent to which the client participates in specific within-session activities. Considered a key therapy ingredient, client involvement facilitates the transmission of therapeutic content from therapist to client (Nock & Ferriter, 2005). And, in fact, client involvement may be particularly important for CBT, which focuses upon skill-building and behaviour change (Karver et al., 2008), and especially for CBT for youths with anxiety (Chu & Kendall, 2004). Future studies may therefore benefit from measuring therapist competence and/or child involvement.

Variance accounted for in the present study resulted mostly from the pretreatment levels of child and parent-reported anxiety and internalizing symptoms, which is in line with previous findings with regard to the prediction of CBT outcome for childhood anxiety disorders (Berman, Weems, Silverman, & Kurtines, 2000). Interestingly, neither child alliance nor treatment adherence accounted for substantial variance in child outcomes. Moreover, the interaction between child alliance and treatment adherence did not explain a meaningful portion of the variance in child outcomes. Indeed, the variance in outcome that was accounted for by technical and relational factors ranged from 0% to 9%. Our findings therefore suggest that other treatment processes account for (more) variability in child outcomes. Despite this fact, the relation between treatment adherence and child alliance differed across the two conditions. In the ICBT condition, the alliance-adherence correlation was significant, indicating that adhering to the treatment manual was not inconsistent with a strong child alliance. In contrast, the adherence-alliance correlation in the GCBT condition was nonsignificant. Variance shared between adherence and child alliance condition was higher (.19 – .20) in ICBT compared to GCBT (.01 – .03). These findings suggest that the relation between technical and relational factors may differ across individual and group-based interventions. As the outcome of individual and group treatment was not significantly different, our results suggest that these different methods of delivery may produce similar remission rates.

The present study has several limitations that bear comment. First, scores on the process measures were generally high with restricted variance. Low variability in process measures represents a limitation in the child field (Chu et al., 2004) and may have limited the likelihood of significant findings in the present study. Second, because the present sample
was comprised of children diagnosed primarily with anxiety disorders, the generalizability to treatment for other primary child emotional or behavioral disorders may be limited. This is important to note because the strength of the alliance-outcome association in child psychotherapy varies across internalizing and externalizing problems (Shirk & Karver, 2003). Third, since the present sample of children were treated with CBT, the findings might not generalize to other treatment approaches (e.g., psychodynamic). Finally, given that the total number of analyses (N=16) exceeds the number of significant findings (n=1), concerns regarding the possibility of chance findings are raised.

Despite these limitations, the current investigation has multiple strengths. First, we examined the relative contribution of treatment adherence and child alliance to child outcomes within interventions with established efficacy. The present study is the first to assess the relative contribution of technical and relational variables simultaneously in different treatment formats. Second, observational measures rated by trained evaluators were used to assess the technical and relational processes. Third, clinical outcomes and treatment processes were assessed at multiple time points, allowing us to rule out alternative explanations. Altogether, these method features helped reduce reporter bias and minimize the chances of alternative explanations accounting for the findings.

This study contributes to a growing area of interest in child psychotherapy focused upon understanding how treatment processes affect the outcome of child psychotherapy. Neither technical nor relational factors predicted traditional measurements of child outcomes in the present study, but a relation between child alliance and outcome has multiple strengths. First, we examined the contribution of the therapeutic alliance to outcome in active versus control psychotherapies. *Journal of Consulting and Clinical Psychology*, 65, 510–514.

**References**


Received: April 7, 2008
Accepted: February 24, 2009
Available online 12 October 2009