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Directionality of Change in Youth Anxiety Treatment Involving Parents: An Initial Examination

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This randomized clinical trial compared cognitive behavioral therapy (CBT) with minimal parent involvement to CBT with active parent involvement in a sample of 119 youths (7–16 years old; 33.6% Caucasian, 61.3% Latino) with anxiety disorders. The dynamics of change between youth anxiety and parent variables (positive–negative behaviors toward the child, conflict in the parent–youth relationship, and parental anxiety) in both treatment conditions over pretreatment, posttreatment, and 12-month follow-up were also examined. Results indicated that youth anxiety was significantly reduced with both treatments and that the dynamics of change may not solely flow from parent to youth but also from youth to parent. Findings highlight the need for research on directionality and mechanisms of change to move from evidence-based treatments toward evidence-based explanations of treatment outcome.

Keywords: anxiety, children, treatment, cognitive behavioral therapy, parent involvement

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Randomized clinical trial evidence has accumulated for the efficacy of cognitive behavioral therapy (CBT) in reducing anxiety disorders in children and adolescents when delivered in either individual or group formats relative to waitlist control conditions (e.g., Kendall, 1994; Silverman et al., 1999). In light of the consistent pattern of evidence for the efficacy of CBT, coupled with etiologic evidence implicating familial contextual influences in the development and maintenance of childhood anxiety disorders (see Ginsburg, Silverman, & Kurtines, 1995; Hudson & Rapee, 2005), a body of literature has evolved evaluating whether parent participation in CBTs enhances treatment efficacy relative to individual or group formats (e.g., Barrett, Dadds, & Rapee, 1996; Cobham, Dadds, & Spence, 1998). Children and adolescents hereafter are referred to as *youth* and these treatments as *parent involvement treatments*.

Barmish and Kendall's (2005) meta-analysis of individual and parent involvement CBTs for use with youth anxiety disorders concluded that in the absence of a consistent pattern of evidence for a relation between parent involvement and change in youth anxiety outcome, "The clearest and safest conclusion is that additional comparative research is needed and that the acceptance of either approach as superior is not yet justified" (p. 579). Results from other meta-analyses have yielded the same conclusion (e.g., Silverman, Pina, & Viswesvaran, 2008). A recent randomized clinical trial also failed to find superior performance of a parent involvement condition compared with individual CBT (Kendall, Hudson, Gosch, Flannery-Schroeder, & Suveg, 2008). On the basis of their findings, Kendall et al. (2008) concluded that "including parents in the child's treatment sessions is not essential to positive gains" (p. 295).

This article reports results of another comparative randomized clinical trial. The trial examined whether active parental involvement in their child's anxiety-reduction CBT program led to enhanced treatment effects relative to an individual child-focused CBT program with minimal parent involvement. All parents in the present study were mothers. The parent involvement treatment condition, cognitive behavioral therapy involving parents (CBT/P), required a high level of parent involvement by having the mother attend the same treatment sessions as her child and be actively involved in and out of sessions. CBT/P targeted three types of parent variables that are implicated in the development and maintenance of youth anxiety (e.g., Ginsburg et al., 1995; Hudson & Rapee, 2005). These variables were: (a) parental positive–negative behaviors toward the child, (b) conflict in the parent–youth dyadic relationship, and (c) parental anxiety.

CBT/P in this study is a prototype of the parent involvement conditions that comprise the youth anxiety treatment research literature. As such, it allowed us to examine for the first time directional dynamics of change between youth anxiety and parent variables. Specifically, in addition to evaluating the relative efficacy of CBT/P and CBT, we moved beyond past youth anxiety efficacy trials in the following way: We tested the common assumption that improvement in parent variables produces reductions in child anxiety relative to an alternative assumption that

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reductions in youth anxiety produce improvements in the parent variables, or that some combination of these dynamics is operative.

Youth Responses as Consequents of Parent Responses

Parents have long been viewed as primary agents of socialization for their children (e.g., Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Grusec & Davidov, 2007). The youth anxiety literature has similarly emphasized the primacy of parents for child socialization processes and effective child regulation of negative emotions (e.g., Hudson & Rapee, 2005). This emphasis on parents is apparent as well in youth anxiety treatments. This treatment literature contains a number of studies that have involved parents and have targeted parent variables to enhance the outcome of youth anxiety treatment (e.g., Barrett et al., 1996; Cobham et al., 1998).

The three types of parent variables addressed by CBT/P in the present study are considered important theoretically, empirically, and clinically in the development and maintenance of youth anxiety; consequently, they are among the most commonly targeted variables for improvement in studies of youth anxiety treatment (Barmish & Kendall, 2005). Specifically, it has often been noted that parents who engage in negative or critical behaviors toward their children tend to have more anxious children (see Hudson & Rapee, 2005). Similarly, research has found that negative parent–child relationships, as reflected by parent–child conflict, tend to be associated with youth anxiety disorders (e.g., Wood, Piacentini, Southam-Gerow, Chu, & Sigman, 2006). Finally, with respect to parental anxiety, it has been suggested that parents who suffer from anxiety symptoms or disorders model caution and avoidant behaviors to their children (Ginsburg et al., 1995).

Overall, involving parents and targeting any one of the above three parent variables has been based on a key assumption that youth responses are consequents of parent responses. Thus, targeting these parent variables should lead to improvement in these parenting areas, which should then be associated with improvement in youth anxiety (e.g., Barrett et al., 1996; Ginsburg et al., 1995). However, empirical support for this assumption is lacking. Parent variables targeted in past studies are rarely assessed. Past studies also have not documented whether changes in these parent variables are associated with changes in youth anxiety outcome. The focus of past studies has been solely on outcome—namely, comparing treatments that target parent variables with treatments that do not. As noted earlier, the results of these comparative studies for youth anxiety CBT programs have been equivocal (for major reviews of this literature, see Barmish & Kendall, 2005; Silverman et al., 2008; see also studies by Barrett et al., 1996; Cobham et al. 1998; Kendall et al., 2008).

Plausible Alternative Models: Parent Responses as Consequents of Youth Responses

Despite the pervasive assumption regarding the primacy of parents as socialization agents (e.g., Collins et al., 2000), most contemporary views emphasize the bidirectional and reciprocal influence of parent–child interactions (Grusec & Davidov, 2007). The possibility that children influence their parents and that reciprocal or bidirectional influences exist between child anxiety and parent variables has been rarely acknowledged in the youth anxiety treatment literature. However, such dynamics are plausible. For example, as youth respond to treatment and their anxiety levels decrease, parents' own anxieties and behavior toward their children may improve by virtue of the changes in their children. Parents also may act more positively toward their children as a result of their children showing less adverse reactions to anxiety-based stressors in their environment.

Yet another possibility is that both dynamics operate such that improvement in youth anxiety results from improvement in the parenting variables and that improvement in the parent variables results from improvement in youth anxiety. This bidirectional influence model is more consistent with the general developmental literature on parent–youth reciprocal influence than either unidirectional influence model.

The present study is the first randomized controlled clinical trial in the literature on youth anxiety treatment to move beyond efficacy by investigating assumptions about directional dynamics of change in youth anxiety CBT. Such issues are important because knowledge about why or how change is produced in youth psychosocial treatments is underdeveloped (e.g., Kazdin, 1999; Silverman & Kurtines, 1997). Advancing theory about directionality of change has the potential to inform the field about the variables that are most critical to target for improvement in treatment.

The Present Study

This randomized clinical trial compared the relative efficacy of a CBT condition that actively involved parents (CBT/P) to a CBT condition with minimal parent involvement. The study examined potential models of the dynamics of change between youth anxiety and parent variables in both treatment conditions over pretreatment, posttreatment, and 12-month follow-up. Predictions that followed from the common assumption that youth responses are consequents of parent responses were: (a) CBT/P will produce greater mean changes in each of the three types of parent variables compared with CBT because the parent variables are targeted in CBT/P, not in CBT; (b) as a result, CBT/P will produce greater reductions in youth anxiety than CBT. Predictions that followed from the alternative assumption of parent response as consequents of youth responses were: (a) CBT and CBT/P will not differ substantially in their effects on youth anxiety because the increased attention of CBT/P on parenting variables represents a focus on variables that are the products of, not the causes of, youth anxiety; and (b) both CBT and CBT/P will produce comparable changes in the parent variables, because parents will respond positively to youth improvements in anxiety in both treatment conditions. In addition, bidirectional influence dynamics were evaluated through longitudinal structural equation modeling, as described later.

Method

Participants

Participants presented to a research clinic specializing in youth anxiety treatment due to difficulties with excessive fear or anxiety; they were referred by pediatricians, school psychologists, and other mental health professionals. Inclusionary criteria, accomplished through standardized diagnostic interviews, were a primary

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anxiety disorder and age range of 7 to 16. Exclusionary criteria were developmental delays (e.g., autism), psychosis or schizophrenia, or current involvement in another psychosocial treatment. A total of 119 youths (51 boys, 68 girls) and their mothers were randomized to CBT or CBT/P. Youths were 7 to 16 years of age (M = 9.93 years, SD = 2.75), and all were born in the United States; 40 (33.6%) were European American, 73 (61.3%) were Hispanic or Latino, and 6 (5.1%) reported "other" or did not report ethnicity. Twenty-eight percent had an annual family income of less than $20,000 and the median income was $34,312.

Participant youths met criteria from the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM–IV*; American Psychiatric Association, 1994) for a primary *DSM–IV* phobic or anxiety disorder on the basis of the Anxiety Disorders Interview Schedule for Children (Child and Parent Versions) for *DSM–IV* (Silverman & Albano, 1996), administered separately to youths and parents. Youths' primary diagnoses were: 34% separation anxiety disorder, 25.6% specific phobia, 20% generalized anxiety disorder, 18.4% social phobia, 1% panic disorder with agoraphobia, and 1% obsessive compulsive disorder. Seventy-two percent had at least one comorbid diagnosis, with generalized anxiety disorder (22.3%), separation anxiety disorder (15.6%), specific phobia (23.5%), and social anxiety disorder (12.3%) being most common.

All of the 119 mother participants reported the same ethnicity as the child. The mothers' mean age was 40.3 years (SD = 5.3). Of these mothers, 39.7% had *DSM–IV* anxiety disorders (full diagnosis or subthreshold) on the basis of the Anxiety Disorders Interview Schedule (Brown, Di Nardo, & Barlow, 1993). Subthreshold was defined as either (a) meeting diagnostic criteria but reporting an interference of less than 4 on the 0–8 Impairment/Interference scale or (b) reporting anxiety symptoms that were rated as 4 or greater on the 0–8 Impairment/Interference scale. The mothers' primary anxiety disorders or subthreshold symptoms were: specific phobia (33%), generalized anxiety disorder (33%), social phobia (20%), separation anxiety disorder (11%), and agoraphobia with panic disorder (3%).

Twenty-two percent of the mothers had comorbid or subthreshold comorbid diagnoses; generalized anxiety disorder (5%), specific phobia (5%), separation anxiety disorder (3.4%), and depression (3.4%) were most common. We administered the separation anxiety disorder section contained in the youth anxiety interview schedule to parents because, in our experience, many parents of anxious youth express their own difficulties relating to separation. As shown in Figure 1, youths and mothers were randomized to the study's treatment conditions; randomization occurred whether the mothers had difficulties with anxiety or not (46.7% had anxiety in CBT/P vs. 53.3% in CBT, a nonsignificant difference).

Measures

Diagnostic Instruments Administered to Youths and Mothers

Anxiety Disorders Interview Schedule for DSM–IV: Child and Parent Versions (ADIS for DSM–IV: C/P; Silverman & Albano, 1996). The ADIS for *DSM–IV*: C/P was administered to each youth and mother to assess anxiety and related disorders in the child. Interviewers assigned diagnoses that youth and mother agreed were most interfering. In cases of disagreement, the interviewer considered both informants' views to derive a final diagnosis. In cases of multiple diagnoses, the relative interference of each disorder was determined by obtaining interference ratings from each source and prioritizing each disorder from most to least interfering or disturbing. The disorder deemed most interfering or disturbing was viewed as primary and was targeted in treatment. In addition to using a primary anxiety diagnosis as a criterion for inclusion in the study, we used diagnostic status as an index of clinically significant improvement. The ADIS for *DSM–IV*: C/P has good to excellent reliability for specific diagnoses and symptom patterns, as well as strong correspondence with youths' anxiety self-ratings (Silverman, Saavedra, & Pina, 2001; Wood, Piacentini, Bergman, McCracken, & Barrios, 2002). In this study, 2-week retest reliability (kappa coefficients) for diagnoses in a subsample of youths (20%) ranged from .80 to .92, and interrater reliability between two blind independent raters based on videotaped interviews ranged from .57 to .86.

Anxiety Disorders Interview Schedule for DSM–IV (ADIS-IV; Brown et al., 1993). The ADIS-IV assesses *DSM–IV* anxiety disorders and related disorders in adults. The ADIS-IV yields satisfactory test–retest and interrater reliability estimates for anxiety diagnoses (Brown et al., 1993). In this study, interrater reliability (kappa coefficient) for a subsample (23%) of parent cases on primary anxiety diagnoses and subthreshold diagnoses was .88. The ADIS-IV (Brown et al., 1993) anxiety diagnoses and subthreshold diagnoses were derived using the same procedures described above for the ADIS for *DSM–IV*: C/P (Silverman & Albano, 1996).

Primary Outcome Measure Completed by Youths

The Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) is a 37-item youth self-rating scale designed to assess anxiety symptoms. Twenty-eight items are summed to yield a Total Anxiety score. Each item is rated *yes* or *no* and scored 1 or 0. The RCMAS is the most widely used child self-rating scale in the research literature on youth anxiety treatment (see review by Silverman & Ollendick, 2005). Pela and Reynolds (1982) reported a 3-week test–retest reliability of .98 for the Total Anxiety scale. Significant correlations have been found between the Total Anxiety scale, trait anxiety, and fear (rs = .63 to .88) (Ollendick, 1983). The alpha coefficient for this sample was .88.

Primary Outcome Measure Completed by Parents

In the Revised Children's Manifest Anxiety Scale (Parent Version; RCMAS/P), the wording of RCMAS items was changed from *I* to *my child*, as done in past research (e.g., Kendall, 1994; Silverman et al., 1999). Each item is rated either *yes* or *no* and scored 1 or 0. Twenty-eight items are summed to yield a Total Anxiety score. In the present study, the alpha coefficient was .85.

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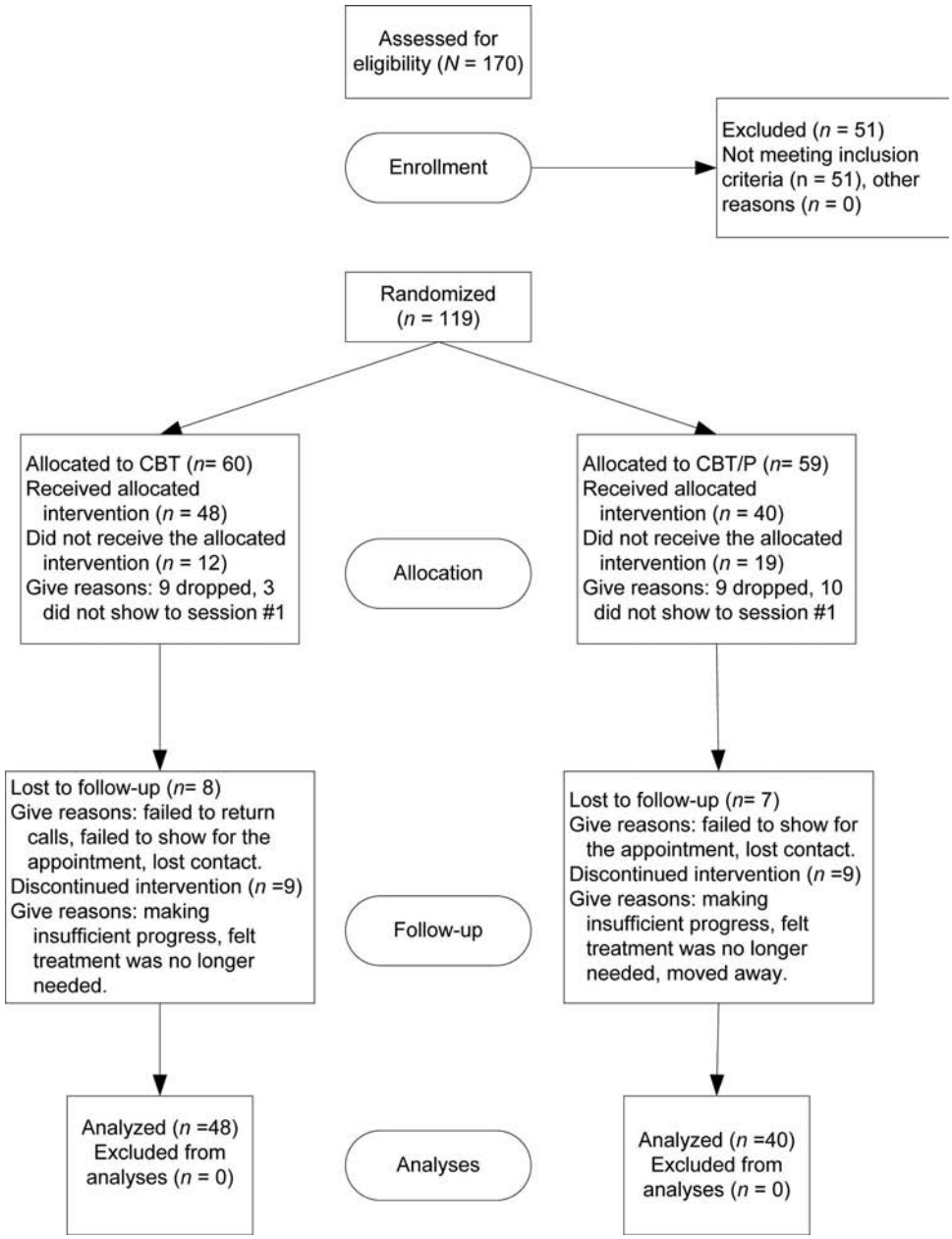

Figure 1. CONSORT flowchart. CBT = cognitive behavioral therapy with minimal parent involvement; CBT/P = cognitive behavioral therapy with active parent involvement.

Secondary Outcome Measure Completed by Parents

The Child Behavior Checklist (CBCL; Achenbach, 1991) is a 118-item parent rating scale designed to assess behavioral and emotional problems in youth. Each item is rated using a 3-point scale (*not true*, *somewhat* or *sometimes true*, or *very true or often true*). *T* scores on the CBCL Anxious/Depressed subscale (CBCL-A/D; Achenbach, 1991) were used, and these can range from 50 to 100. Achenbach (1991) reported a 7-day test–retest reliability of .89 for the Anxious/Depressed subscale and significant correlations with the Conners Behavior scale (*rs* = .59 to .86).

Parent Variables Measures

Conflict Behavior Questionnaire (CBQ; Prinz, Foster, Kent, & O'Leary, 1979). The CBQ is a 44-item measure that assesses: (a) the youth's positive–negative appraisal of the parent's behavior toward him or her and (b) the youth's appraisal of conflict in the parent–youth dyadic relationship. Youth participants completed the CBQ with their mothers as the target parent. Scores for the youth's positive–negative appraisal of the parent's behavior are derived from 28 items and range from 0 to 20. Scores for the youth's appraisal of conflict are derived from 16 items and range from 0 to 10. Reverse scoring is why the

range is less than the total number of items. Robin and Foster (1989) reported a 6- to 8-week retest reliability of .57 and .84 for these scales. The alpha coefficients for the youths' appraisal of their mothers' behaviors and of conflict in the relationship were .76 and .94, respectively.

Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983). The SCL-90-R is a 90-item rating scale designed to assess psychopathological symptoms in adults. Each item is rated on a 5-point scale of distress (*not at all* to *extremely*). We used the Anxiety scale, which contains 10 items. Mothers' scores on the SCL-90-R Anxiety scale were averaged, leading to a possible range of 0 to 4. One week retest reliability for the Anxiety scale has been found to be .80, with concurrent validity estimates ranging from .44 to .57 (Derogatis, 1983). The alpha coefficient for the Anxiety scale was .88 in this study.

Clinically Significant Improvement Variables

ADIS for DSM–IV: C/P (Silverman & Albano, 1996). Whether youths continued to meet their primary targeted diagnosis at posttreatment (i.e., recovered vs. not recovered) was one index of clinically significant improvement. Interviewers were blinded regarding the treatment condition to which participants had been randomly assigned.

CBCL-A/D subscale (Achenbach, 1991). Clinically significant improvement, or changes that returned deviant participants to within nondeviant limits, was defined as a minimum criterion *T* score of less than 70, adjusted according to age norms, as in past studies (e.g., Kendall, 1994; Silverman et al., 1999).

Children's Global Assessment Scale (C-GAS; Bird et al., 1993). The C-GAS is a 1 to 100 clinician rating scale designed to assess functional impairment in youth. The scale is divided into deciles that include behavioral descriptors of the severity of symptoms in terms of their impact on school, family, and peer relationships. Scores less than 67 are considered to be in the clinical range. As in previous research, C-GAS ratings were derived during case conference meetings headed by Wendy K. Silverman. Past work has yielded an interrater reliability coefficient of .66 (intraclass correlation), with validity shown by "caseness" (Bird et al., 1993).

Procedure

All of the study's assessment and treatment procedures were approved by the university's Institutional Review Board. After parents provided informed consent and youths provided informed assent, the interviews and questionnaires were administered across two sessions spaced 1 week apart. All measures were completed at pretreatment, posttreatment, and 1-year follow-up. Families who met the study's inclusion criteria were invited back to the clinic and informed consent or assent was obtained for their participation in the randomized trial.

Treatment Conditions

Manuals were developed for CBT and CBT/P for purposes of standardization and replication (Silverman, 1997a, 1997b; see also Silverman & Kurtines, 1996). The treatment strategies for reducing youth anxiety were the same in both conditions; they consisted of (a) systematic and gradual youth exposures to anxiety-provoking situations and (b) behavioral and cognitive strategies to facilitate the exposures. The same homework assignments and handouts were used in both treatments; each treatment condition lasted 12 to 14 sessions and was about 60 min long. Parental involvement was incorporated into CBT/P training by targeting (a) parental positive–negative behaviors toward the child, (b) conflict in the parent–youth dyadic relationship, and (c) parental anxiety, as needed.

CBT

CBT targeted youth anxious symptoms in an individual youth format. The treatment consisted of exposing youth to anxiety-provoking stimuli and training in behavioral and cognitive strategies. Parent participation was minimal. The youth met separately with the therapist for 50 min, followed by a 10-min meeting among the youth, parent, and therapist. In this meeting, the youth's progress and homework assignment were summarized.

CBT/P

CBT/P targeted youths' anxious symptoms in a parent–youth dyadic format and used the same treatment strategies used in CBT. In CBT/P, the mothers participated extensively during the sessions. The youth and mother met together with the therapist for the full 60 min of each session in the same room, with each dyad member actively engaged by the therapist. In each session, the youth–parent dyad actively planned the youth's exposure tasks and the parent's exposure tasks for parents with anxiety, when applicable. When maternal anxiety was treated, it was done within the context of treating her child's anxiety. For example, when the therapist reviewed the youth's experiences in conducting the previous week's out-of-session task, the therapist would also ask the mother to discuss her experiences in front of the child.

Overall, in CBT/P, both parent and child shared their experiences, offered each other feedback, and provided suggestions for the next assignment. Three to four sessions were dedicated to targeting the other two parent variables by training parents in child behavior management skills, parent–child communication, and problem-solving skills. Training in child behavior management skills entailed teaching parents to manage their child's fearful and avoidant behaviors and use appropriate contingencies to facilitate child exposure. Parent–child communication training instructed parents and children to structure time for weekly discussions, learn to listen and respond in nonthreatening ways, and identify appropriate ways of expressing needs, wants, and emotions. Problem-solving skills training focused on mutually defining conflicts between the dyad, brainstorming alternative solutions, selecting a solution, and assessing the outcome.

Treatment Integrity

Treatment sessions were video-recorded, and therapists were not aware of which sessions were to be evaluated for integrity. Following treatment, independent evaluators (graduate students not involved in the present study) rated 20% of randomly selected videotapes to yield an overall evaluation of treatment integrity. The selected tapes were rated on the basis of therapists' verbalizations and behaviors; integrity was assessed by means of a

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checklist developed for this study. The checklist assessed the presence or absence of the active ingredients that were expected to be delivered in accordance with the CBT and CBT/P manuals.

The presence or absence ratings for the three targeted parent training areas yielded 100% for CBT/P and 0% for CBT. Most pertinent to this study is that CBT, when delivered, involved minimal parental involvement, whereas CBT/P, when delivered, involved active and extensive parental involvement. To determine if this was the case, each of the three parenting variables targeted in CBT/P was rated by the independent evaluators on a 0- to 8-point scale, where 0 represented *no parental involvement* and 8 represented *maximum, a great deal* of parental involvement. Average ratings for the level of parent involvement for each of the three targeted parent variables in CBT/P were: parent–child dyadic relationship = 7.20 (SD = .39), parental behavior toward child = 7.20 (SD = .39), and parental anxiety = 4.0 (SD = 2.45), addressed as needed. This indicates that these variables were satisfactorily targeted.

Therapists

Six doctoral-level graduate students in psychology treated the majority of the cases. Because most of the components of CBT and CBT/P were overlapping and do not require differential skill level and background, therapists were randomly assigned to cases across conditions. All therapists were trained in the proper administration of the treatment conditions by Wendy K. Silverman, who held weekly on-site supervision meetings. Analyses of pretreatment to posttreatment response on the primary outcome variables showed no statistically significant differences between any of the therapists.

Results

Preliminary and Supplemental Analyses

In all analyses, outlier analyses were performed to identify influential cases that might mask basic trends in the data (see Wilcox, 2005). No meaningful outliers were detected. Nonnormality was evident in several of the variables, so bootstrapping was used for tests of statistical significance. We tested for attrition bias (i.e., not completing treatment) at the immediate posttreatment by creating a dummy variable for each initially enrolled case, scored 1 = completed the posttreatment assessment and 0 = did not complete the assessment. We correlated this dummy variable with the demographic and clinical variables assessed at pretreatment. No statistically significant effects were observed; this was also true for comparable analyses focusing on attrition at the follow-up. All analyses pointed to a process whereby data were missing at random.

We performed two types of analyses relative to the missing data. First, we analyzed data only for those participants who completed treatment. We felt that the theoretical relations being tested would most likely manifest themselves for individuals who completed all treatment sessions. Second, we conducted analyses using both full information estimation maximum likelihood (FIML) methods and multiple imputation strategies based on the Expectation Maximization algorithm (Honaker, Joseph, King, Scheve, & Singh, 2003). Conclusions from all analyses were comparable, unless otherwise noted. Results reported below are for treatment completers.

The correlation between the parents' ratings of youth anxiety and the youths' self ratings of anxiety was .15 at the pretest, .27 at the immediate posttest, and .33 at the follow-up, with the latter two being statistically significant ($p < .05$). These generally modest correlations are typical of past research (Achenbach, McConaughy, & Howell, 1987) and led us to treat the parent and youth ratings on the respective versions of the RCMAS as separate primary outcome measures.

Outcome Analyses

This section evaluates differential effects of the two treatment conditions on the primary and secondary outcome variables. Analyses were based on treatment completers. Intent-to-treat analyses yielded the same conclusions. Table 1 presents the mean values on all relevant variables for treatment completers. Pretreatment mean differences between groups were not statistically significant. Across-time mean differences in outcome measures within each of the treatment conditions were tested using single degree of freedom contrasts for dependent means with nonpooled error terms based on all case information available for that contrast (Jaccard & Guilamo-Ramos, 2002a, 2002b).

Pretreatment to Posttreatment Effects

There were statistically significant changes from pretreatment to posttreatment for both CBT and CBT/P on the primary outcomes measures—specifically, youth self-ratings of anxiety—on RCMAS: for CBT/P, $t(29) = 5.14$, $p < .05$, $\eta^2 = .46$; for CBT, $t(38) = 4.33$, $p < .05$, $\eta^2 = .33$; and parents' ratings of their child's anxiety using the RCMAS/P: for CBT/P, $t(27) = 5.23$, $p < .05$, $\eta^2 = .50$; for CBT, $t(31) = 4.96$, $p < .05$, $\eta^2 = .45$. This also was true for the study's secondary outcome measure, the CBCL-A/D: for CBT/P, $t(33) = 2.75$, $p < .01$, $\eta^2 = .19$; for CBT, $t(38) = 3.57$, $p < .01$, $\eta^2 = .25$. In all cases, the direction of the mean difference was toward decreased anxiety (see Table 1). Contrasts that tested if these effects differed by treatment condition yielded nonsignificant results, none of which remotely approached significance (all $\eta^2 < 0.05$).

In terms of the parent variables, contrasts on parental anxiety revealed significant effects from pretreatment to posttreatment for both CBT/P and CBT [SCL-90-R Anxiety; for CBT/P, $t(30) = 1.93$, $p < .06$, $\eta^2 = .11$; for CBT, $t(36) = 4.03$, $p < .05$, $\eta^2 = .30$]. Although the former effect was just above the alpha level of .05 for the analysis of treatment completers, the contrast yielded a p value below .05 in the full information maximum likelihood procedure and multiple imputation analyses described in the supplement. The mean difference in the CBT/P condition should be viewed as a "fragile" effect, accordingly. In both conditions, parental anxiety was reduced across time (see Table 1). A contrast that tested whether these effects differed as a function of treatment was nonsignificant.

Statistically significant changes in the youths' appraisal of the parents' positive or negative behaviors (CBQ Appraisal of Parent) and conflict in the parent–youth dyadic relationship (CBQ Appraisal of Dyad) also occurred from pretreatment to posttreatment in CBT. For CBT, appraisals of the parent became more positive, $t(36) = 2.87$,

Table 1
Means and Standard Deviations for Child Symptom Variables and Parent Variables at Pretreatment, Posttreatment, and Follow-Up for CBT and CBT/P

	CBT (n = 48)						CBT/P (n = 40)					
	Pretreatment		Posttreatment		Follow-up		Pretreatment		Posttreatment		Follow-up	
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Primary outcomes												
RCMAS	12.27	7.19	7.40	7.74	5.08	6.17	13.81	6.33	9.66	7.82	5.73	7.45
RCMAS/P	11.66	6.03	6.78[a]	6.83	6.19[a]	7.57	11.62	5.75	7.26[b]	6.14	6.11[b]	6.03
Secondary outcome												
CBCL—Anxious/Depressed	61.91	13.11	54.38[a]	12.23	51.48[a]	16.83	61.36	14.46	54.97[b]	13.17	51.67[b]	17.76
Parent variables												
SCL-90-R-Parent Anxiety	0.47	0.68	0.21[a]	0.54	0.30[a]	0.26	0.39[b]	0.43	0.25[c]	0.44	0.39[b,c]	0.50
CBQ Appraisal of Parent Behavior	14.57	2.74	13.23[a]	2.64	12.86[a]	3.20	15.18	4.50	13.80	3.03	12.67	2.87
CBQ Appraisal of Dyadic Conflict	10.01	1.34	9.34[a]	1.43	9.38[a]	1.57	10.10[b]	1.20	10.02[b]	1.89	9.14	1.96

Note. Within a treatment condition and within a row, the means are statistically significantly different ($p < .05$) unless they share a common superscript. CBT = cognitive–behavioral therapy; CBT/P = cognitive–behavioral therapy involving parents; RCMAS = Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1978); P = parent; CBCL = Child Behavior Checklist (Achenbach, 1991); SCL-90-R = Symptom Checklist-90-Revised (Derogatis, 1983); CBQ = Conflict Behavior Questionnaire (Prinz et al., 1979; youth version).

$p < .05$, $\eta^2 = .18$, as did appraisals of the dyadic relationship, $t(36) = 2.50$, $p < .05$, $\eta^2 = .15$ (see Table 1). For CBT/P, only youth appraisal of the parent's positive or negative behaviors showed a statistically significant improvement between pretreatment and posttreatment, $t(26) = 3.05$, $p < .05$, $\eta^2 = .25$. Contrasts revealed no difference as a function of treatment, with none of the effects remotely approaching significance (all η^2 below .05).

Posttreatment to Follow-Up Effects

As seen in Table 1, the positive effects of the treatments on youth anxiety continued to manifest themselves in youth self-ratings of anxiety scores at the follow-up, and the improvement in these effects was statistically significant relative to those at the posttreatment [RCMAS; for CBT/P, $t(22) = 2.57$, $p < .05$, $\eta^2 = .23$; for CBT, $t(29) = 2.39$, $p < .05$, $\eta^2 = .16$ (see means in Table 1)]. For mothers' ratings of their child's anxiety (RCMAS/P), there was no significant improvement, but also no significant decay in treatment effects. On mothers' reports on the CBCL-A/D, scores at the follow-up were significantly improved relative to those at the posttreatment for CBT only, $t(27) = 2.34$, $p < .05$, $\eta^2 = .17$.

Maternal anxiety via the SCL-90-R showed the same trend, namely, no significant improvement or decay in either treatment condition. Youths' CBQ appraisal of the parent's positive or negative behaviors revealed no significant improvement or decay from posttreatment to follow-up in CBT, but there was continued improvement in CBT/P, $t(21) = 2.84$, $p < .05$, $\eta^2 = .27$. This also was true of the youths' CBQ appraisal of conflict in the parent–youth dyadic relationship, $t(21) = 2.81$, $p < .05$, $\eta^2 = .27$ (see Table 1).

Clinically Significant Improvement

Significant improvements were observed across the three variables of clinical significance, with no significant differences found between the two treatments. This was true for both pretreatment to posttreatment and posttreatment to follow-up. In terms of diagnoses derived using the ADIS for *DSM–IV*: C/P, 78.4% of treated youth across both conditions did not have their primary diagnosis present at posttreatment, $\chi^2(1, N = 88) = 28.41$, $p < .001$. When CBCL-A/D scale *T* scores were used, 77% of treated youth across both conditions were no longer within the clinical range, $\chi^2(1, N = 88) = 3.77$, $p < .05$, at posttreatment. In terms of C-GAS scores (*DSM–IV*: Axis-V), 83% of treated youth across both conditions were no longer within the clinical range, $\chi^2(1, N = 88) = 35.56$, $p < .001$, at posttreatment. When the ADIS for *DSM–IV*: C/P was used, 91% of youth did not have their primary diagnosis present at 1-year follow-up. All effects were maintained after Holm's modified Bonferroni corrections were applied.

Structural Equation Modeling

The data were further analyzed using structural equation modeling (SEM) to yield more insight into the underlying dynamics, which are depicted in Figure 2. Table 2 presents the fit indices for the study's major analyses using standard SEM. The scores of the pretreatment measures were used as covariates for the analysis of group differences (CBT versus CBT/P) in posttreatment and follow-up means (Rausch, Maxwell, & Kelley, 2003). A two-valued dummy variable (D, scored 1 or 0) for the two treatment conditions (CBT versus CBT/P) was defined and was assumed to impact the outcome, O, in question (youth anxiety), at the posttreatment (O_2) and at the follow-up (O_3). The residual terms for O_2 and O_3 were allowed to be correlated, to recognize the fact that the correlation between O_2 and O_3 was not due solely to the common cause of D. Four covariates were included in the analysis: (a) the outcome as measured at pretreatment (O_1), (b) youth's gender, (c) youth's age, and (d) comorbidity status. Paths were included from each of these variables to all endogenous variables. Figure 2 excludes the covariates of gender, age, and comorbidity status as well as the correlations between exogenous variables to avoid clutter, but these were included in all model tests. Because of the relatively small sample size, separate analyses were conducted for

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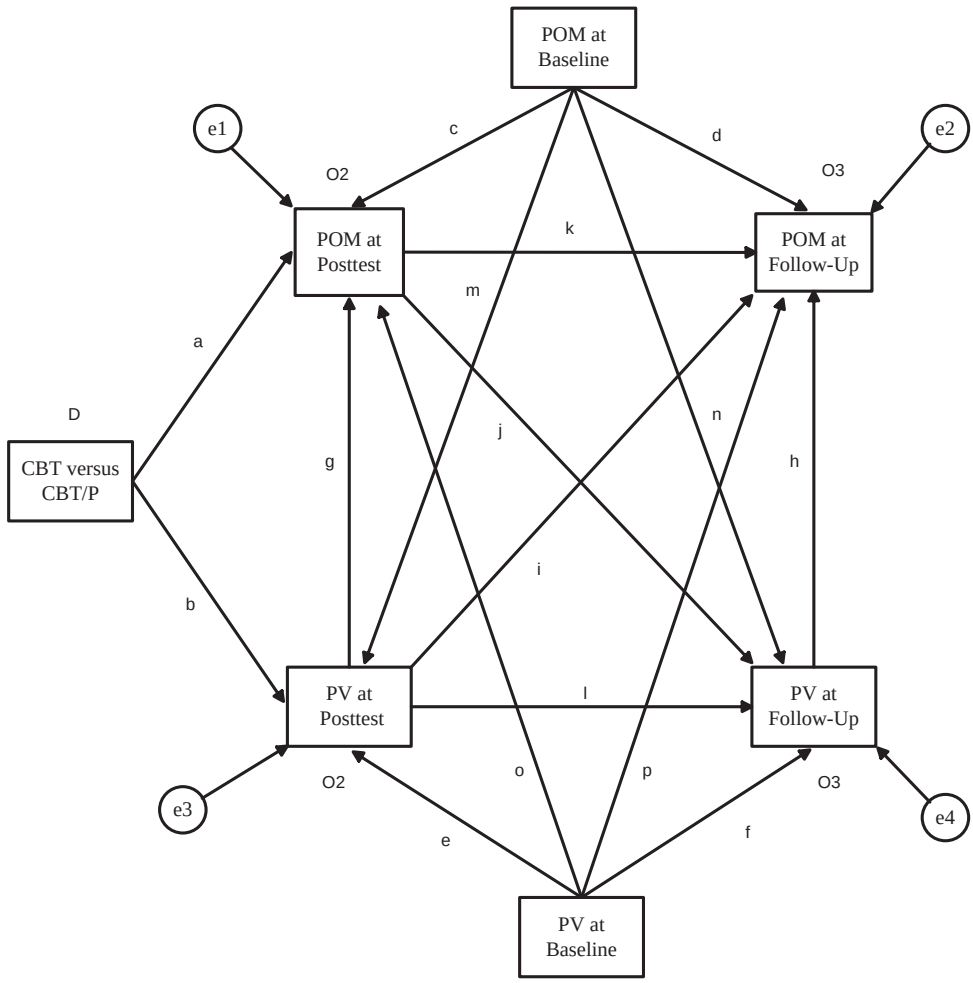

Figure 2. Path model for effects of parent variables on youth primary outcome variables. POM = primary outcome measures (Revised Children's Manifest Anxiety Scale [RCMAS] and RCMAS/Parent Version); CBT = cognitive behavioral therapy; CBT/P = cognitive behavioral therapy involving parents; PV = parent variables (Symptom Checklist-90-Revised, Conflict Behavior Questionnaire–Appraisal of Parent Behavior, and Conflict Behavior Questionnaire–Appraisal of Dyadic Conflict).

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the youth self ratings of anxiety and the parent ratings of youth anxiety and for each of the three parent variables. The Appendix elaborates on the interpretation of the underlying linear equations implied by Figure 2 and describes the overall fit of the tested models relative to the data.

Paths *g* and *h* require clarification, and we use parent anxiety as the parent variable (PV) to explicate the modeling approach relative to these paths. Each path represents contemporaneous reciprocal causality, in that (a) changes in youth anxiety are assumed to impact changes in parental anxiety, and (b) changes in parent anxiety are assumed to impact changes in youth anxiety (see Appendix). The values of these reciprocal paths cannot be estimated from the data because this portion of the model is statistically underidentified. We therefore analyzed the model twice: once where paths *g* and *h* flowed from youth anxiety to the parent anxiety variables, and a second time where the reverse was true (i.e., where paths *g* and *h* flowed from parent anxiety to youth anxiety). In both cases, the general hypothesis being tested is whether changes in youth anxiety are associated with changes in parent anxiety; which direction(s) the causal arrow should take is ambiguous (i.e., the two models are "equivalent" or "redundant" in SEM parlance). Assuming the causal direction is one way or the other did not affect other key path coefficients and conclusions about other paths in Figure 2. Because the previously reported analyses suggest that the causal flow is from youth anxiety to parent variables, we present results in the context of this model. The conclusions are the same whichever way the model is represented in terms of paths *g* and *h*.

The key paths of interest are *g* through *p*. As noted, paths *g* and *h* reflect contemporaneous change and estimate the extent to which changes in the youth symptom variables (youth anxiety) are associated with changes in the parent contextual variables (parent anxiety, youth appraisal of the parent, youth appraisal of the relationship) at posttreatment (path *g*) and at follow-up (path *h*). Paths *i* and *j* reflect lagged effects and estimate the extent to which changes in parent variables from pretreatment to posttreatment are associated with changes in youth symptom variables from post-

Table 2
Fit Indices for Major Analyses Using Structural Equation Modeling

Model	χ^2	CFI	RMSEA	*p* close
SCL-90-R-Parent Anxiety and RCMAS	0.84	1.00	<0.001	0.73
SCL-90-R-Parent Anxiety and RCMAS/P	1.18	1.00	<0.001	0.64
CBQ Appraisal of Parent and RCMAS	1.69	1.00	<0.001	0.53
CBQ Appraisal of Parent and RCMAS/P	0.81	1.00	<0.001	0.72
CBQ Appraisal of Dyad Conflict and RCMAS	1.25	1.00	<0.001	0.63
CBQ Appraisal of Dyad Conflict and RCMAS/P	0.41	1.00	<0.001	0.86

Note. Chi-square is goodness of fit index based on maximum likelihood criterion (model degrees of freedom = 2); CFI = Comparative Fit Index; RMSEA = root mean square error approximation test; *p* close = *p* value for close fit associated with the RMSEA; RCMAS = Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1978); P = parent; SCL-90-R = Symptom Checklist-90-R (Derogatis et al., 1976); CBQ = Conflict Behavior Questionnaire (Prinz et al., 1979; youth version).

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treatment to follow-up (path *i*), as well as the extent to which changes in youth symptom variables from pretreatment to posttreatment are associated with changes in the parent variables from posttreatment to follow-up (path *j*). Such lagged effects make theoretical sense because it may take time for the changes in one variable to work their way through and produce changes in the other variable.

Paths *k* and *l* represent traditional autoregressive effects in which change in an outcome from pretreatment to posttreatment is associated with change in the same outcome from posttreatment to follow-up. Paths *m* and *n* reflect whether change in parent variables between pretreatment and posttreatment is associated with the initial level of youth symptom variables (path *m*) and whether change in parent variables between the immediate posttreatment and the follow-up is associated with the initial level of youth symptom variables (path *n*). Paths *o* and *p* reflect whether change in youth symptom variables between pretreatment and the immediate posttreatment is associated with the initial level of parent variables (path *o*), and whether change in youth symptom variables between the immediate posttreatment and the follow-up is associated with the initial level of parent variables (path *p*).

In all cases, the model provided a good fit to the data (see Appendix). Consistent with the prior analyses, there were no statistically significant path coefficients associated with the dummy variable representing the two treatment conditions, so no further mention is made of these. We consider each parent variable in turn.

Parental Anxiety

The statistically significant path coefficients for paths *g* through *p* for the model using the RCMAS and for the model using the RCMAS/P are shown in the first two rows of Table 3. If a path coefficient is not presented in the table, then it was not statistically significant. First, path *g* was statistically significant ($p < .05$), suggesting that changes in youth anxiety from the pretreatment to the posttreatment were associated with changes in parent anxiety during this same time period. The causal direction implied by this association is ambiguous, because the model fit was also good, and the paths were statistically significant when the causal direction of path *g* was reversed.

Second, path *n* was statistically significant for both outcome variables in a way that implied that mothers who were most likely to show reductions in anxiety on the SCL-90-R Anxiety scale from pre- to posttreatment were those whose children tended to have higher anxiety on the RCMAS at pretreatment. Third, path *k* was statistically significant in a way suggesting that youths who showed the most decreases on the RCMAS from pre- to posttreatment were most likely to show decreases in anxiety between posttreatment and 1-year follow-up.

Youth Appraisal of Parental Positive–Negative Behaviors Toward the Child

Analysis of the model in Figure 2 was repeated, but using the youth's appraisal of his or her parent's positive–negative behaviors

Table 3
Unstandardized and Standardized Path Coefficients for Key Paths in Figure 2

Model	Path *g*	Path *j*	Path *k*	Path *l*	Path *m*	Path *n*
SCL-90-R-Parent Anxiety and RCMAS	4.67 (0.30)*	*ns*	0.42 (0.57)*	*ns*	*ns*	0.02 (0.40)*
SCL-90-R-Parent Anxiety and RCMAS/P	4.49 (0.37)*	*ns*	0.54 (0.56)*	*ns*	*ns*	0.04 (0.60)*
CBQ Appraisal of Parent and RCMAS	0.63 (0.25)*	0.16 (0.36)*	0.47 (0.63)*	0.55 (0.49)*	*ns*	*ns*
CBQ Appraisal of Parent and RCMAS/P	*ns*	0.19 (0.35)*	0.55 (0.57)*	0.61 (0.55)*	*ns*	*ns*
CBQ Appraisal of Dyad Conflict and RCMAS	*ns*	*ns*	0.46 (0.61)*	*ns*	−0.06 (−0.24)*	*ns*
CBQ Appraisal of Dyad Conflict and RCMAS/P	*ns*	*ns*	0.53 (0.55)*	*ns*	*ns*	*ns*

Note. Standardized coefficient shown in parentheses. First variable named in the first column is the presumed causal influence, and second variable is the outcome. Letters of paths refer to paths in Figure 1. RCMAS = Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1978); P = parent; SCL-90-R = Symptom Checklist-90-Revised (Derogatis et al., 1976), CBQ = Conflict Behavior Questionnaire (Prinz et al., 1979; youth version).
* $p < .05$; *ns* = nonsignificant.

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in place of parent anxiety as the parent variable. Rows 3 and 4 of Table 3 report the statistically significant path coefficients. If we focus on path coefficients whose significance replicated across the two different primary outcome measures of youth anxiety (RCMAS and RCMAS/P), there were two that are noteworthy. First, reductions in youth self ratings of anxiety between pretreatment and posttreatment were predictive of reductions in parents' negative behavior toward them between the posttreatment and the follow-up (path *j*), as reported by the youth. This suggests that changes in youth anxiety impact changes in parental variables rather than vice versa. Path *j* represents a lagged effect in which it takes time for improvements in youth anxiety to work their way through to result in more positive parenting behaviors. The second noteworthy statistically significant finding was that youth-rated reductions in parents' negative behavior toward them between the pretreatment and posttreatment were predictive of reductions in parents' negative behavior toward the child between the posttreatment and the 1-year follow-up (path *l*).

Youth Appraisal of Conflict in the Parent–Youth Dyadic Relationship

The final set of analyses focused on the youth's ratings of conflict in the parent–youth dyadic relationship (see Rows 5 and 6 of Table 3). The only significant path coefficient (in addition to path *k*) was path *m*, indicating that parent–youth dyads that showed reductions in negative relationships from pretreatment to posttreatment, as reported by the youth, were those in which children tended to report higher pretreatment anxiety.

Discussion

Consistent with past research, the present study found that youth anxiety was reduced whether parents are either minimally involved (CBT) or actively involved (CBT/P) in their child's treatment (Kendall et al., 2008; Silverman et al., 2008). Both CBT and CBT/P produced statistically significant treatment effects on youth anxiety between pretreatment and posttreatment, and these effects were maintained at follow-up. The pattern of findings was the same for the study's primary and secondary outcome measures of youth anxiety symptoms, as well as the indexes of clinically significant improvement.

A fundamental premise of past research using treatments that involve parents is that parents play a role in contributing to or alleviating their children's anxiety. The present results are the first to provide evidence suggesting that reciprocal influence between youth anxiety and parenting variables should be considered as theoretically plausible. For several reasons, the evidence for youth-to-parent influence was somewhat stronger than the more traditional view of either parent-to-child influence or bidirectional influence. First, there were no significant differences in youth anxiety for a treatment intervention that directly targeted the parent variables (CBT/P) compared with a treatment intervention that did not (CBT). If youth responses are consequents of parent responses, this should not be the case. Second, in the intervention that targeted only youth anxiety (i.e., CBT), all three of the parent variables showed statistically significant improvement, and the magnitude of the effects were comparable to the CBT/P condition. This is consistent with the assumption that changes in youth anxiety produce changes in parent anxiety. Third, in the SEM analyses, changes in youth anxiety from pretreatment to posttreatment were related to changes in parent anxiety during the same time period. Although the causal direction of this association is ambiguous, we observed results consistent with a lagged effect that linked changes in youth anxiety from pretreatment to posttreatment to improved parental negative behaviors at follow-up—one of the three parent variables examined.

Thus, although the study did not provide unequivocal evidence for youth-to-parent influence, the pattern of findings suggested such an interpretation. Our findings suggest, for example, that the commonly observed association between negative parental behaviors or relationships and youth anxiety may reflect the impact of youth anxiety on these parenting variables, rather than vice versa. That is, as the youth's anxiety improves, the negative parenting shows improvement as well. It is certainly premature to conclude that the three parental variables studied do not have causal significance for child anxiety. However, the pattern of findings suggests that a reverse causal mechanism should be taken seriously in future theoretical accounts.

If replicated in future studies, these findings have important clinical implications. They suggest that treating parent anxiety and parent–youth relationships may have limited effects on youth anxiety outcome. They also suggest the need to carefully consider the clinical issues involved in a given case when targeting parenting variables, rather than automatically assuming that targeting parent variables will enhance youth anxiety outcome beyond individual youth CBT. It might be the case, for example, that targeting parental anxiety in an intervention only makes sense when parents are clinically anxious.

The present study has limitations, and it is important to be cautious in interpreting the results in light of these limitations. One limitation is that parent anxiety was assessed only from the perspective of the mother, and the parent–youth dyadic relationship and parent behavior toward the child were assessed only from the perspective of the youth. As an initial study aimed at examining the nature of the association of change between youth anxiety and parent variables, this measurement approach was reasonable. Caution is nevertheless needed because of potential source effects in the data. However, if source effects were driving the study's data, then one would expect the observed source effects to contaminate all analyses and produce effects across analyses that focused on common youth and parent measures. Evidence of such source effects was lacking when cross-source correlations and path coefficient were examined (e.g., between a youth and parent measure).

A second limitation was the correlational nature of some of the analyses and assumptions that were needed about the timing of causal dynamics between cause and effects. A better design would involve more intensive and frequent measurement, including the measuring of youth outcome and parent variables on a session by session basis (Kraemer, Wilson, Fairburn, & Agras, 2002).

Of note is that the statistically significant lagged path from youth to parent for negative parenting behaviors was not observed for parent–youth relationships or for parental anxiety. Such differential findings suggest that the issue of the directionality of effects is likely to be complex and difficult to unravel, depending on the outcome in question. Advances in research designs and methods may be required to address fully the issue of the directionality of intervention change.

A third limitation concerns difficulties associated with making statements about treatment equivalence, in this case between the CBT/P and the CBT. Some contrasts were based on a small sample size and were somewhat underpowered to detect treatment differences. With the sample sizes used in this study of about 45 per group, the power to detect a medium effect size, as defined by Cohen (1989), is approximately .50, and the power to detect a large effect size is approximately .85. Future work with larger samples should be pursued that permits the application of formal equivalence testing frameworks (see Rogers, Howard, & Vessey, 1993).

An argument also could be made that the lack of significant differences between CBT/P and CBT occurred not because parent variables are of minimal import but because the "dosage level" of the parental component of CBT/P was too low. This would create a scenario whereby one was effectively comparing CBT with itself. We doubt that this can account for the present data because we used direct and well-developed procedures for addressing the various parent outcomes in the CBT/P condition, evidenced as well by the treatment integrity ratings.

Finally, all of the parent participants were mothers, and only the mental health status of participant mothers was evaluated. The scarcity of father involvement in psychological research has likely yielded an incomplete picture of the familial context in children's socialization, including the area of youth anxiety and its treatment (Duhig, Renk, Epstein, & Phares, 2000; Moreno, Silverman, Saavedra, & Phares, 2008). Further research on the role of fathers in their children's anxiety treatment is needed.

Despite these limitations, the results of this study are intriguing. They set the stage for future research to more clearly establish the direction of parent–youth change in youth anxiety CBT. They also set the stage for future research that focuses not only on evidence-based treatments but evidence-based explanations for treatments, using mediation-outcome research designs.

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Appendix

For the SEM models, evaluations of model fit focused on standard global fit criteria as well as focused tests of fit based on modification indices, standardized residual covariances, theoretical coherence, and the absence of offending estimates. Table 2 presents the global fit indices for all the major analyses reported in the main text of the paper. All point to good fit.

As noted, the models were defined following the logic of Rausch et al. (2003) for the analysis of covariance of randomized clinical trials with three waves of assessment (pretreatment, immediate posttreatment, and follow-up). This focused on covariate-adjusted change, in which the pretreatment measure of the outcome and the outcome at the posttreatment are strategically used as covariates to define different features of change. The interpretation of coefficients is based on the various linear equations defined by Figure 2. To be explicit, let POM_1, POM_2 and POM_3 be the measures of child anxiety at the pretreatment, immediate posttreatment, and follow-up, respectively; let PV_1, PV_2, and PV_3 be the measures of parent anxiety at the pretreatment, immediate posttreatment, and follow-up, respectively; let D be a two-valued dummy variable for the treatment condition (CBT versus CBT/P), G be a two-valued dummy variable for gender, C be a measure of comorbidity, and A be a continuous measure of the child's age. Key linear equations implied by Figure 2 are:

$$POM_3 = \alpha_1 + \beta_1 POM_1 + \beta_2 POM_2 + \beta_3 PV_1 + \beta_4 PV_2 + \beta_5 PV_3 + \beta_6 G + \beta_7 C + \beta_8 A + \varepsilon_1;$$

$$PV_3 = \alpha_2 + \beta_9 POM_1 + \beta_{10} POM_2 + \beta_{11} PV_1 + \beta_{12} PV_2 + \beta_{13} G + \beta_{14} C + \beta_{15} A + \varepsilon_2;$$

$$POM_2 = \alpha_3 + \beta_{16} POM_1 + \beta_{17} PV_1 + \beta_{18} POM_2 + \beta_{19} D + \beta_{20} G + \beta_{21} C + \beta_{22} A + \varepsilon_3; \text{ and}$$

$$PV_2 = \alpha_4 + \beta_{23} POM_1 + \beta_{24} POM_2 + \beta_{25} D + \beta_{26} G + \beta_{27} C + \beta_{28} A + \varepsilon_4.$$

Coefficients are then interpreted as in standard regression analysis of panel data, with each beta representing a given path coefficient in Figure 2.

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