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Cognitive-behavioral therapy for anxiety-disordered youth: Secondary outcomes from a randomized clinical trial evaluating child and family modalities

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ABSTRACT

This study examined secondary outcomes of a randomized clinical trial that evaluated an individual cognitive-behavioral (ICBT), family-based cognitive-behavioral (FCBT), and family-based education, support and attention (FESA) treatment for anxious youth. Participants (161) were between 7 and 14 years (M = 10.27) of age and had a principal diagnosis of separation anxiety disorder, social phobia, and/or generalized anxiety disorder. Hierarchical linear modeling examined youth-reported depressive symptomatology and parent- and teacher-reported externalizing behavior and adaptive functioning at pretreatment, posttreatment, and 1-year follow-up. In general, youth in all treatments evidenced improvements in most domains, with improvements maintained at follow-up. Overall, gender and age did not moderate treatment outcomes. The results suggest that both child and family cognitive-behavioral therapy, and the family-based supportive approach used in this study, can be effective in addressing some of the associated symptoms and adaptive functioning deficits typically linked to anxiety in youth.

A growing body of research supports the use of individual (e.g., Kendall, Flannery-Schroeder, Panichelli-Mindel, & Southam-Gerow, 1997; Kendall, Hudson, Gosch, Flannery-Schroeder, & Suveg, 2008; Pina, Silverman, Fuentes, Kurtines, & Weems, 2003), group (Flannery-Schroeder & Kendall, 2000; Manassis et al., 2002; Shortt, Barrett, & Fox, 2001), and family-based variants (Barrett, Dadds, & Rapee, 1996; Bogels & Siqueland, 2006; Thienemann, Moore, & Tompkins, 2006; Wood, Piacentini, Southam-Gerow, Chu, & Sigman, 2006) of cognitive-behavioral therapy (CBT) for treating anxiety disorders in youth. The improvements in anxious symptoms reported by independent research teams are generally consistent across informants (i.e., clinician-, child-, parent-, and teacher-reporters) and have been extended to minority youth (e.g., Pina et al., 2003; Silverman et al., 1999; Southam-Gerow, Kendall, & Weersing, 2001).

Preliminary research has also found evidence for supportive, non-CBT approaches for treating anxiety in youth (Kendall et al., 2008; Silverman et al., 1999). In one study, Silverman et al. (1999) compared an exposure-based contingency management, and exposure-based cognitive self-control, and education-support control condition in the treatment of youth who primarily had a diagnosis of a phobia. The education support did not include the use of exposures (i.e., it was designed as a control condition) though results indicated that youth in all conditions showed comparable improvements at the 3-, 6-, and 12-month follow-up periods. In a study that included youth with a principal diagnosis of SAD, SP, and/or GAD, Kendall et al. (2008) compared individual cognitive-behavioral (ICBT), family-based cognitive-behavioral (FCBT), and a family-based education-support (FESA) control condition. The latter condition was designed to control for the common therapy factors (e.g., time spent with a therapist and psychoeducation regarding anxiety) but did not include the theoretically active components of CBT (i.e., use of exposure tasks). Results indicated that youth in CBT evidenced significantly better outcomes based on diagnostic interviews than youth in the FESA condition. Youth in ICBT also evidenced significantly greater reductions in anxiety based on teacher reports than youth in the other two conditions. However, youth in all conditions evidenced comparable gains on most other child-, parent-, and teacher-reports of functioning. Two external CBT experts unaware of the

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purpose or title of the FESA therapy manual rated it for CBT content and reported that 65% of the manual had CBT content and procedures. Three CBT therapists rated segments of randomly selected FESA sessions for CBT content and found CBT content present in the FESA sessions when unintended. Despite the presence of CBT in the FESA sessions, the amount of CBT present in the sessions was generally not related to treatment outcome. Regardless, though FESA was intended to be an active psychosocial treatment, but one that did not have the theoretically active components of CBT, the integrity check of the FESA condition actually showed otherwise. Neither the Silverman et al. (1999) study nor the Kendall et al. (2008) study compared the treatments on phenomena typically associated with anxiety.

Collectively, relatively much is known about the impact of psychosocial therapies on anxiety specifically compared to what is known about the effects of such approaches on phenomena typically associated with anxiety (e.g., externalizing behaviors) and adaptive functioning (e.g., academic). The goal of this study is to compare an individual child-focused CBT (i.e., ICBT), FCBT, and FESA on associated phenomena (e.g., depression and externalizing behavior) and adaptive functioning (e.g., academic). The study moves beyond previous research by comparing variants of CBT (individual and family-based CBT) and an active, though non-CBT, psychosocial treatment. Comparison of three active psychosocial treatments provides a rigorous test of outcomes.

Anxiety and depression frequently co-occur (Angold & Costello, 1993; Biederman, Faraone, Mick, & Lelon, 1995; Brady & Kendall, 1992). One investigation (Berman, Weems, Silverman, & Kurtines, 2000) found a relationship between depressive symptoms and a less favorable anxiety treatment response, but other research has not (Southam-Gerow et al., 2001). Investigators have also examined whether favorable anxiety treatment gains generalize to depressive symptoms. Manassis et al. (2002) examined the impact of group CBT (GCBT) and a child-focused CBT (ICBT) on children's self-reported depressive symptoms. Children, who were between the ages of 8 and 12, had a diagnosis of generalized anxiety disorder (GAD), separation anxiety disorder (SAD), social phobia (SoP), or panic disorder (PD). Results indicated significant changes, with children in both groups showing significant reductions in depressive symptoms at post-treatment. Barrett et al. (1996) reported similar results following ICBT or CBT plus family management: youth (aged 7–14) in either treatment exhibited significant reductions in self-reported depressive symptoms at posttreatment, and 6-, and 12-month follow-up. The effects of exposure-based contingency management, exposure-based cognitive self-control, and an education-support control condition were examined by Silverman et al. (1999) with youth aged 6–16 years with a principal diagnosis of simple phobia. Children in all conditions demonstrated significant reductions in depression symptoms that were maintained at 3-, 6-, and 12-month follow-ups. Similar results have been reported (e.g., Kendall, 1994; Kendall et al., 1997; Kendall, Safford, Flannery-Schroeder, & Webb, 2004; Nauta, Scholing, Emmelkamp, & Minderaa, 2003), but less is known about the potentially differential effects of individual or family CBT on depressive symptoms.

Research indicates that anxiety in youth can co-occur with externalizing problems (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Costello et al., 1996; McConaughy & Achenbach, 1994). The presence of externalizing disorders has not been found to moderate anxiety outcomes (Berman et al., 2000; Flannery-Schroeder, Suveg, Safford, Kendall, & Webb, 2004; Rapee, 2000; Southam-Gerow et al., 2001). However, some research suggests that in comparison to youth with a single form of psychopathology, youth with comorbid internalizing and externalizing psychopathology may suffer even more severe negative developmental consequences (Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003). It is of interest to evaluate whether the positive gains associated with anxiety treatment generalize to externalizing behavior. In one study (Kendall, 1994), parent-reported externalizing symptoms following ICBT with 9–13-year-old anxiety-disordered youth showed improvements at post-treatment and 1-year follow-up. A later study by Barrett (1998), using mother and father reports of externalizing symptoms and comparing GCBT, GCBT plus family management (GFCBT), and waitlist, found slightly greater gains in the GFCBT condition than in the other conditions. Similar results were found by Pina et al. (2003) who examined ICBT for European-American and Hispanic/Latino youth diagnosed with GAD/OAD, SAD, SoP, or specific phobia (SP). Both groups of youth demonstrated significant reductions in externalizing symptoms posttreatment. The positive impact of anxiety treatment on externalizing symptoms held at follow-up (Barrett, Duffy, Dadds, & Rapee, 2001; Kendall et al., 2004). Though research supports a reduction in externalizing symptoms following anxiety treatment, exceptions are noted. For example, Nauta et al. (2003) (studying 7–18-year-old anxiety-disordered youth) compared ICBT, ICBT plus cognitive parent training condition, and waitlist and found no significant effects on parent-reported externalizing symptoms. Although the Nauta et al. sample was somewhat older than the previously reviewed literature, age is not a likely explanation for the differential findings because age and treatment outcome were unrelated. Little is known about the effects of individual or family CBT on externalizing symptoms.

Are favorable anxiety treatments associated with improvements in adaptive functioning? Researchers have assessed adaptive functioning using a variety of methods. For example, Cobham, Dadds, and Spence (1998) used independent clinicians' ratings, and the results indicated significant improvements in children's overall functioning. Barrett et al. (1996) used a similar assessment and found comparable results. Specific domains of adaptive functioning have also been assessed. Using a prospective approach, Wood (2004) examined the impact of reductions in anxiety on 6–13-year-old children's social and academic adjustment. Clinicians, children, and parents rated youths' anxiety, parents reported on youths' academic functioning, and both children and parents reported on children's social functioning. Regression analyses indicated relationships between anxiety reductions and improved academic and social outcomes over time, and the effects did not vary by age or gender.

Collectively, variants of CBT for anxious youth result in improvements in depressive symptoms, externalizing behavior, and adaptive functioning. However, the comparison conditions in prior research can be considered lacking: in only one study (Silverman et al., 1999) was an active comparison treatment evaluated. Given that mostly phobic youth were included, it is not yet known whether or not there are favorable secondary outcomes associated solely with CBT or with an alternate psychosocial approach when applied to youth experiencing other forms of anxiety.

The present study examined the impact of ICBT, FCBT, and FESA treatment on measures of outcome for youth with a principal diagnosis of GAD, SAD, or SoP. Based on the reviewed literature we expected that improvements on secondary outcomes would be comparable across the CBT variants. Though less is known about the impact of non-CBT approaches on related phenomenon, preliminary research suggests positive outcomes associated with such approaches (e.g., Kendall et al., 2008; Silverman et al., 1999). Thus, we anticipated that FESA would have similar positive outcomes as the CBT conditions.

1. Method

The characteristics of the sample and the methods used are described in full detail in Kendall et al. (2008); an overview is provided here.

1.1. Participants

Community sources referred 231 youth, aged 7–14 years, for possible participation in the study. A total of 161 were subsequently included in the study because they met inclusion criteria (i.e., met criteria for a principal diagnosis of SAD, GAD, or SP, had at least one English-speaking parent) and did not meet any exclusion criteria (i.e., presence of psychotic symptoms, mental retardation, a disabling medical condition, the child's participation in concurrent treatment, or the child taking antianxiety or antidepressant medications). Of the 161 youth, 55 were randomly assigned to ICBT, 56 to FCBT, and 50 to the FESA condition. Attrition included 5, 7, and 11 participants from ICBT, FCBT, and FESA, respectively (no significant differences in attrition from each group). Eighty-eight children were diagnosed with a *principal* diagnosis of GAD, 47 with SAD, and 63 with SP based on structured interviews. Twenty-four percent of children were comorbid with GAD, 32% with SAD, 37% with SoP, 53% with SP, 32% with ADHD, 14% with ODD, 6% with dysthymia and 5% with MDD. Few participants were comorbid with other diagnoses (e.g., 1 child met for conduct disorder).

1.2. Setting and personnel

All procedures were conducted at the Child and Adolescent Anxiety Disorders Clinic (CAADC), Temple University. Doctoral candidates in clinical psychology conducted structured diagnostic interviews and assessments and Masters' or doctoral level therapists completed all therapy.

1.3. Measures

Outcomes were evaluated via changes in children's self-reported negative affectivity statements, children's self-reported depressive symptoms, externalizing symptoms (parent and teacher reports) and adaptive functioning (parent and teacher reports). Differential diagnostic, age, and gender effects were also examined.

1.4. Child psychopathology

Anxiety Disorders Interview Schedule for Children (ADIS-C/P; Silverman & Albano, 1996). Children's anxiety was assessed using the ADIS-C/P for *DSM-IV* (American Psychiatric Assoc, 1999) disorders. This is a semi-structured interview with established reliability and convergent validity. Experienced diagnosticians trained independent evaluators (IEs) by observing practice administrations with clients, providing feedback/supervision, and monitoring performance with reliability assessments. Trainees were required to reach and maintain inter-rater diagnostic reliability of .85 (Cohen's κ). Training prepared IEs to provide ratings on the ADIS-C/P Clinical Rating Scale (Albano & Silverman, 1996; Silverman & Albano, 1996) regarding the severity of the child's anxiety (0 = *not at all*, 4 = *some*, 8 = *very, very much*).

1.5. Child self reports

Children's Depression Inventory (*CDI*). The CDI (Kovacs, 1985, 1992) contains 27 items assessing cognitive, affective, and behavioral depressive symptoms. The scale has internal consistency, moderate retest reliability, and correlates with measures of related constructs (Kovacs, 1992). Psychometric and normative data are available.

1.6. Parent and teacher reports of child functioning

Child Behavior Checklist (*CBCL*: Achenbach, 1991; Achenbach & Edelbrock, 1991). The CBCL is a 118-item checklist. Parents report whether their child displays various behaviors by circling 0 (*not true*), 1 (*somewhat/sometimes*), or 2 (*very/often true*). The measure generates *T* scores that reflect a child's status relative to others of the same sex and age. Respondents with a *T* score of $\geq$65 can be in need of treatment. The present study utilized the externalizing symptom (CBCL-Ext), activities (CBCL-Activities), social competency (CBCL-Social), and school performance (CBCL-School) scales. The Activities scale includes ratings for variables such as the number of recreational activities the youth participates in and their regular chores, as well as ratings of the amount and quality of the child's participation in the various activities. The Social scale includes scores for participation in organizations, number of friends and the frequency of out-of-school contact, and the youth's ability to get along with others. The School scale assesses performance in academic domains. Validity, internal consistency, and retest reliability have been documented (Achenbach & Rescorla, 2001).

Teacher's Report Form (TRF; Achenbach, 1991; Achenbach & Edelbrock, 1986). The primary teacher rated the child's classroom functioning on the TRF. The TRF mirrors the parent CBCL. The present study utilized the externalizing symptom (TRF-Ext) scale. The TRF has high retest reliability, moderate inter-teacher agreement, and discriminates between referred and non-referred children (Achenbach, 1991).

2. Procedure

Cases were referred through multiple community sources (e.g., postings on community bulletin boards and pediatrician offices). Following an initial phone screen, participants were scheduled for a complete assessment where they were administered a diagnostic interview, completed several self-report questionnaires, and engaged in other tasks that were part of a larger study (i.e., Kendall et al., 2008). Cases that did not meet study criteria were assisted in locating services as appropriate. Appropriate cases were randomly assigned to one of the three treatment conditions. A posttreatment and 1-year follow-up assessment was conducted. Attempts were made to ensure that the same diagnostician conducted the pre, post, and follow-up assessments when possible and that they were blind to treatment arm. For example, diagnosticians were excluded from all treatment-related discussions. Participants in the FESA condition who met criteria for a disorder at posttreatment were offered either ICBT or FCBT.

2.1. Treatment methods

All three treatments, which included 16 weekly, 60-min sessions, followed therapist manuals and supplemental materials to facilitate participant engagement (Howard, Chu, Krain, Marrs-Garcia, & Kendall, 2000; Kendall & Hedtke, 2006a, 2006b; Krain, Hudson, Choudhury & Kendall, 2000). ICBT was conducted individually with the child whereas FCBT and FESA were carried out with the child and both parents. ICBT and FCBT had two 8-session segments. The first provided psychoeducation and taught skills to the child/family, whereas the second provided the child/family the chance to practice new skills in exposure tasks. FESA provided therapeutic support and attention to the families and education about anxiety for 16 sessions. All treatments included education about youth anxiety, but only ICBT and FCBT taught skills to manage anxious distress and included exposure tasks. Thus, FESA was designed to control for the common treatment components such as learning about anxiety, and experience with a therapist. Refer to Kendall et al. (2008) for detailed descriptions of each treatment arm and for treatment integrity procedures.

Several procedures were implemented to ensure treatment integrity. First, therapists followed a treatment manual. Then,

raters were trained extensively on how to conduct treatment integrity checks. Trained individuals rated 15-min therapy session segments for 30% of randomly selected cases from each treatment condition. The raters used a checklist that included the intended content and strategies for each treatment session to facilitate their assessment. Unannounced reliability checks throughout the study revealed that all raters maintained reliability (.85, Cohen's κ).

Finally, using the same checklist described previously, experienced CBT therapists rated 14% of randomly selected treatment sessions. As reported in Kendall et al. (2008) analyses indicated that therapists in ICBT covered a significantly greater percentage of intended content than did therapists in the FESA condition (91%, 92%, and 85% of intended content was covered in ICBT, FCBT, and FESA respectively).

3. Results

Hierarchical linear or mixed models containing random factors for subject, fixed effects for treatment condition (ICBT, FCBT and ESA) and time (pre, post and follow-up) were fitted to child depression (CDI), externalizing symptoms (CBCL), and adaptive functioning (CBCL: activities, social and school competence) using the Linear Mixed Models package in SPSSv.16. The data were analyzed with a random-intercept model of the form:

$$Y_{ij} = B_{0ij} + B_1 time2_{ij} + B_2 time3i_j + B_3 condition2_j + B_4 condition3_j + B_5 time2.condition2_{ij} + B_6 time2.condition3_{ij} + B_7 time3.condition2_{ij} + B_5 time3.condition3_{ij} + \varepsilon_{0ij}$$

where *time*2 and *time*3 are indicator variables representing time, *condition*2 and *condition*3 are indicator variables representing condition, and the *time·condition* terms represent interactions. The intercept term B_{0ij} is made up the fixed term, B_0, and random variation due to subjects, μ_{0j}, so $B_{0i} = B_0 + \mu_{0j}$. The subscript *j* indexes subjects and *i* indexes observations within subjects. Terms with the subscript *ij* are at level 1 of the multilevel model, while those with subscript *j* are at level 2 of the model.

Additional mixed model analyses tested age and gender effects. Analyses included all randomized cases (intent-to-treat analyses); analyses were also conducted for those cases that completed treatment. Perhaps due to the low attrition, comparable results were consistently found for both sets of analyses, thus only the intent-to-treat analyses are reported. Effect sizes were calculated as the estimated fixed effect divided by the square root of the sum of the two variance components in the mixed model.

3.1. Depressive symptoms

Mixed models were fitted to child-reported depression (CDI; see Tables 1 and 2).[1] The model showed a significant Time effect with significant reductions from pre to post, and pre to follow-up. Follow-up comparisons revealed significant change in depressive symptoms from pre to post $t(213) = 4.71$, $P < .01$, $d = .65$, and from pre to follow-up $t(233) = 4.97$, $P < .01$, $d = .65$, but no significant improvement from post to follow-up $t(233) = 1.25$, $P = .21$ (pre $M = 10.52$, S.E. = .58; post $M = 7.63$, S.E. = .61; follow-up $M = 6.61$, S.E. = .78). There were no significant effects for Condition or Time × Condition and no effects for gender. There were no significant interactions between Age × Time and no significant Age × Time × Condition effect.

[1] All CDI subscales were analyzed using the same structural model as the total CDI score. The results from the subscale analyses were similar in magnitude and direction to the Total CDI score, and thus, only the results for the total CDI score are reported.

3.2. Externalizing behavior

Mixed models fitted to mother- and father-reported CBCL-Ext showed a significant Time effect (see Tables 1 and 2). Mothers reported significant decreases in externalizing from pre to post $t(221) = 4.53$, $P < .01$, $d = .61$, from pre to follow-up, $t(227) = 7.05$, $P < .01$, $d = .94$, and from post to follow-up, $t(226) = 3.44$, $P < .01$, $d = .46$. The Condition effect and the Condition × Time interaction were not significant. For mothers there were no significant interactions. For fathers, there was a significant interaction for Time × Age. The Age effect from post to follow-up was not significant, $t(170) = .92$, $P = .36$, but was significant from pre to post, $t(170) = 2.25$, $P < .05$, $d = .35$, and pre to follow-up $t(172) = 2.83$, $P < .01$, $d = .43$. Younger compared to older children showed significant reductions in father-rated externalizing from pre to post and pre to follow-up (pre to post change: older 1.09 and younger 3.93; pre to follow-up: older 2.19 and younger 6.42). There was no significant gender effect.

A mixed model was fitted to teacher-reported externalizing (TRF-Ext). There were no significant differences in change from pre to post or from post to follow-up between ICBT, FCBT and FESA. There were no significant effects for age or gender.

3.3. Adaptive functioning

3.3.1. CBCL competency scales: activities

A mixed model was fitted to mother- and father-reported activities (CBCL-Activities) and there were no significant main effects for Condition, or Condition × Time interaction (see Tables 1 and 3). Although there were no Time effects for mother report, fathers reported significant increases in activities between post and follow-up, $t(183) = 2.57$, $P < .01$, $d = .38$ (pre $M = 43.5$, S.D. = .60; post $M = 42.71$, S.D. = .65; follow-up $M = 44.75$, S.D. = .78). There were no significant differences between pre and post and pre and follow-up ($P > .05$). For mother report, there was no effect for gender. No significant age effect for mother- or father-reported activities and no significant interactions.

3.3.2. CBCL competency scales: social competence

Mother- and father-reported social competence was also examined with no significant effects for Time or Condition × Time Time (see Tables 1 and 3). There was no main effect of Condition in both mother- and father-reported social competence. Mother-reported social competence showed a significant age effect: older children had lower levels of social activities. Father-reported social competence showed a significant Time × Age interaction. The Age effect was not significant from pre to post $t(205) = 1.24$, $P = .23$, or from post to follow-up $t(177) = 1.66$, $P = .10$, but was significant from pre to follow-up, $t(182) = 3.11$, $P < .01$, $d = .46$. Younger compared to older children showed significantly greater improvement in father-rated social competence from pre to follow-up (pre to follow-up: older $M = 1.78$ and younger $M = 3.01$).

Mother-reported social competence showed a significant Condition × Time × Gender interaction (Fig. 1). Within the female sample, there was a significant Condition × Time interaction that was not observed in the male sample. For girls, there was a significant interaction from post to follow-up $t(92) = 3.19$, $P < .01$, $d = .67$ where children in the ICBT showed more positive change than children in the FCBT. There were no significant effects from pre to post, $t(91) = 1.77$, $P = .08$, and from pre to follow-up, $t(94) = 1.69$, $P = .09$. There were no gender effects for father-reported social competence.

3.3.3. CBCL competency scales: academic functioning.

Mother-reported (see Tables 1 and 3) but not father-reported school performance showed a significant Time effect with

Table 1
Estimated marginal means and standard errors for child-, mother-, father-, teacher-reported depression and externalizing symptoms across time.

Measure	Treatment conditions									*F* values
	ICBT			FCBT			FESA			
	Pre	Post	FU	Pre	Post	FU	Pre	Post	FU	
CDI *M* (S.E.)	10.88 (.99)	7.27 (1.04)	6.63 (1.16)	10.86 .(98)	7.98 (1.05)	6.95 (1.21)	9.82 (1.03)	6.95 (1.21)	6.25 (1.65)	Time effect: $F(2,224) = 17.35$, $P < .001$
CBCL-E (mother report) *M* (S.E.)	53.46 (1.49)	50.98 (1.53)	47.76 (1.65)	55.38 (1.49)	51.14 (1.53)	49.05 (1.71)	51.46 (1.55)	49.70 (1.57)	46.80 (1.90)	Time effect: $F(2,224) = 26.76$, $P < .001$ Time × Age effect: $F(2,220) = 2.88$, $P = .06$
CBCL-E (father report) *M* (S.E.)	51.56 (1.62)	49.67 (1.69)	48.01 (1.76)	51.42 (1.66)	48.44 (1.72)	47.01 (1.84)	52.59 (1.64)	49.75 (1.67)	47.32 (2.00)	Time effect: $F(2,176) = 18.34$, $P < .001$ Time × Age effect: $F(2,171) = 4.73$, $P < .01$
TRF-Ext *M* (S.E.)	52.28 (1.19)	50.45 (1.28)	48.50 (1.59)	51.13 (1.18)	51.91 (1.30)	49.36 (1.52)	50.02 (1.24)	50.88 (1.30)	52.15 (1.93)	Time × Condition: $F(4,185) = 2.02$, $P = .09$
CBCL-Activities (mother) *M* (S.E.)	42.58 (.99)	44.90 (1.02)	44.86 (1.15)	45.48 (1.01)	45.80 (1.02)	45.72 (1.20)	46.80 (1.03)	46.20 (1.05)	46.09 (1.40)	Gender effect: $F(1,149) = 3.03$, $P = .08$
CBCL-Social (mother) *M* (S.E.)	40.61 (1.24)	39.55 (1.27)	42.67 (1.47)	42.08 (1.27)	42.51 (1.28)	42.70 (1.51)	42.77 (1.28)	44.74 (1.30)	45.76 (1.77)	Condition effect: $F(2,159) = 2.51$, $P = .09$ Age effect: $F(1,153) = 6.64$, $P < .01$ Condition × Time × Gender: $F(6,217) = 2.24$, $P < .05$
CBCL-School (mother) *M* (S.E.)	42.86 (1.09)	43.73 (1.12)	45.75 (1.27)	42.43 (1.12)	43.26 (1.12)	46.21 (1.30)	43.64 (1.12)	43.71 (1.13)	44.77 (1.52)	Time effect: $F(2,222) = 6.04$, $P < .01$ Condition × Time × Gender: $F(6,205) = 2.59$, $P < .05$
CBCL-Activities (father) *M* (S.E.)	42.95 (1.03)	40.79 (1.14)	44.12 (1.22)	43.95 (1.05)	43.62 (1.14)	46.65 (1.30)	43.60 (1.06)	43.72 (1.10)	43.49 (1.52)	Time effect: $F(2,181) = 3.31$, $P < .05$
CBCL-Social (father) *M* (S.E.)	41.28 (1.31)	39.81 (1.41)	41.92 (1.52)	43.76 (1.30)	44.05 (1.39)	44.76 (1.56)	43.28 (1.31)	42.00 (1.35)	42.99 (2.01)	Condition effect: $F(2,137) = 2.70$, $P = .071$ Time × Age effect: $F(2,178) = 4.94$, $P < .01$
CBCL-School (father) *M* (S.E.)	44.37 (1.25)	48.02 (1.30)	46.50 (1.41)	45.23 (1.25)	45.12 (1.32)	45.69 (1.47)	46.01 (1.24)	45.59 (1.25)	44.74 (1.73)	Condition × Time: $F(4,171) = 2.08$, $P = .09$ Time × Age: $F(2,165) = 3.09$, $P < .05$ Gender effect: $F(1, 123) = 3.75$, $P = .06$

Note: CBCL-Ext and TRF-Ext data are reported in *T* scores. NASSQ data are reported in *Z* scores. Pre, pretreatment; post, posttreatment; FU, 1-year follow-up.

Table 2
Effects of ICBT, FCBT and FESA for child-, mother-, father-, and teacher-reported depression and externalizing symptoms across time.

	CDI		MCBCL-Ext		FCBCL-Ext		TRF-Ext	
	B (S.E.)	*d*	*B* (S.E.)	*d*	*B* (S.E.)	*d*	*B* (S.E.)	*d*
Fixed effects								
Intercept 1								
• Intercept (FESA at pre)	9.82 (1.03)***	1.35	51.46 (1.55)***	4.69	52.59 (1.64)***	4.84	50.02 (1.24)***	5.81
• FESA-ICBT (at pre)	1.06 (1.42)	.15	2.00 (2.15)	.18	−1.03 (.66)	.09	2.26 (1.71)	.26
• FESA-FCBT (at pre)	1.04 (1.42)	.14	3.92 (2.16)+	.36	−1.17 (2.33)	.11	1.11 (1.71)	.13
Pre to posttreatment slope								
• Control slope (FESA)	−2.20 (1.10)*	.30	−1.76 (1.09)	.16	−2.84 (1.06)**	.26	.86 (1.15)	.10
• FESA versus ICBT	−1.40 (1.52)	.19	−.72 (1.53)	.07	.96 (1.53)	.09	−2.69 (1.64)	.31
• FESA versus FCBT	−.68 (1.52)	.09	−2.48 (1.53)	.23	−.13 (1.54)	.01	−.08 (1.64)	.01
Pre to follow-up slope								
• Control slope (FESA)	−3.57 (1.65)*	.49	−4.66 (1.53)**	.43	−5.27 (1.52)***	.49	2.13 (1.82)	.25
• FESA versus ICBT	−.67 (2.02)	.09	−1.04 (1.97)	.09	1.73 (1.93)	.16	−5.91 (2.38)*	.69
• FESA versus FCBT	−.35 (2.06)	.05	−1.68 (2.02)	.15	.86 (1.99)	.08	−3.90 (2.30)+	.45
[Pre to posttreatment slope]								
• ICBT versus FCBT	.72 (1.48)	.10	−1.76 (1.52)	.16	−1.09 (1.56)	.10	2.61 (1.65)	.30
[Pre to follow-up slope]								
• ICBT versus FCBT	.33 (1.68)	.05	−.64 (1.80)	.06	−.86 (1.76)	.08	2.01 (2.07)	.23
Post to follow-up slope								
• Control slope (FESA)	−1.37 (1.69)	.19	−2.90 (1.54)+	.26	−2.43 (1.55)	.22	1.27 (1.85)	.15
• FESA versus ICBT	.73 (2.08)	.10	−.32 (1.99)	.03	.77 (1.99)	.07	−3.22 (2.42)	.37
• FESA versus FCBT	.33 (2.11)	.05	.80 (2.02)	.07	1.00 (2.02)	.09	−3.82 (2.38)	.44
• ICBT versus FCBT	−.40 (1.74)	.06	1.13 (1.82)	.10	.23 (1.80)	.02	−.60 (2.15)	.07
Random effects								
Level 1: residual variance	26.48		28.21		21.97		27.55	
Level 2: intercept variance	26.35		91.81		96.03		46.40	

Note: Analyses reported within square brackets indicate additional mixed models conducted to enable all comparisons to be reported. These analyses resulted in different intercepts.
* $P < .05$.
** $P < .01$.
*** $P < .001$.
+ $P < .10$.

significantly higher mother-reported school performance at follow-up compared to pre, $t(228) = 3.46$, $P < .001$, $d = .46$, and posttreatment, $t(226) = 2.65$, $P < .01$, $d = .35$ (pre $M = 42.97$, S.E. = .64; post $M = 43.57$, S.E. = .65; follow-up $M = 45.58$, S.E. = .79). There were no significant differences between pre and post ($P > .3$) and no significant Condition effects were observed for mother and father-reported school performance. Age and gender effects in school performance differed according to mother and father report. For mother-reported school performance, no significant age and main effects were observed but a significant Condition × Time × Gender interaction was observed (Fig. 2). For boys, there was a significant Condition × Time interaction that was not observed in girls. For boys, there was a significant interaction from post to follow-up where children in the FCBT showed more positive change than children in the FESA $t(123) = 3.18$, $P < .01$, $d = .57$, and children in the ICBT showed more positive change than children in the FESA, $t(122) = 2.20$, $P < .05$, $d = .40$. Similarly, from pre to follow-up FESA children showed less positive change than children in the FCBT, $t(123) = 2.63$, $P < .01$, $d = .48$.

When age and gender were entered for father-reported school performance, there was a significant effect for Time × Age. The age effect was not significant from pre to post $t(163) = .21$, $P = .84$, but was significant from pre to follow-up $t(170) = 2.32$, $P < .02$, $d = .36$, and from post to follow-up $t(164) = 2.17$, $P < .05$, $d = .34$. Younger compared to older children showed greater improvement in father-rated school performance from pre to follow-up (older = −1.48 and younger = 2.26) and from post to follow-up (older = −2.39 and younger = 1.04).

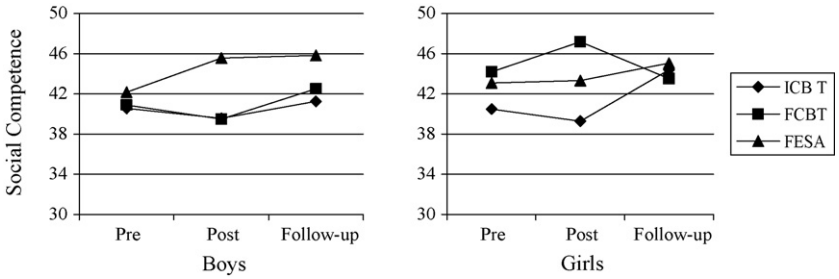

Fig. 1. Condition × Time × Gender interaction for mother-reported social competence at pretreatment (pre), posttreatment (post), and follow-up for youth in individual cognitive-behavioral therapy (ICBT), family-based cognitive-behavioral therapy (FCBT), and family-based education, support, and attention.

Table 3
Effects of ICBT, FCBT and FESA for mother- and father-reported CBCL competencies across time.

	MCBCL-Activities		MCBCL-Social		MCBCL-School		FCBCL-Activities		FCBCL-Social		FCBCL-School	
	B (S.E.)	*d*	*B* (S.E.)	*d*	*B* (S.E.)	*d*	*B* (S.E.)	*d*	*B* (S.E.)	*d*	*B* (S.E.)	*d*
Fixed effects												
Intercept 1												
• Intercept (FESA at pre)	46.80 (1.03)***	6.51	42.76 (1.28)***	4.77	43.64 (1.12)***	5.55	43.60 (1.06)***	6.34	43.24 (1.33)***	5.06	46.01 (1.24)***	5.74
• FESA-ICBT (at pre)	−4.22 (1.42)**	0.59	−2.15 (1.78)	.24	−.78 (1.56)	.10	−.65 (1.48)	.10	−2.27 (1.87)	.27	−1.64 (1.76)	.20
• FESA-FCBT (at pre)	−1.32 (1.44)	.18	−.68 (1.80)	.08	−1.21 (1.58)	.15	.36 (1.49)	.05	.37 (1.87)	.04	−.78 (1.76)	.10
Pre to posttreatment slope												
• Control slope (FESA)	−.60 (.98)	.08	1.98 (1.26)	.22	.08 (1.05)	.01	.12 (1.09)	.02	−.84 (1.29)	.10	−.42 (1.13)	.05
• FESA versus ICBT	2.91 (1.37)*	.40	−3.04 (1.78)+	.34	.80 (1.48)	.10	−2.28 (1.56)	.33	−.63 (1.83)	.07	4.07 (1.63)*	.51
• FESA versus FCBT	.92 (1.37)	.13	−1.55 (1.78)	.17	.76 (1.49)	.10	−.46 (1.56)	.07	1.18 (1.85)	.14	.31 (1.64)	.04
Pre to follow-up slope												
• Control slope (FESA)	−.70 (1.35)	.10	2.99 (1.75)+	.33	1.14 (1.46)	.15	−.10 (1.51)	.01	.27 (1.88)	.03	−1.27 (1.66)	.16
• FESA versus ICBT	2.99 (1.73)+	.42	−.94 (2.27)	.10	1.75 (1.89)	.22	1.28 (1.93)	.19	−.20 (2.35)	.02	3.40 (2.09)	.42
• FESA versus FCBT	.95 (1.77)	.13	−2.38 (2.30)	.27	2.65 (1.92)	.34	2.80 (1.98)	.41	1.26 (2.42)	.15	1.73 (2.14)	.22
[Pre to posttreatment slope]												
• ICBT versus FCBT	−1.99 (1.36)	.28	1.49 (1.77)	.17	−.04 (1.49)	.01	1.83 (1.59)	.27	1.81 (1.87)	.21	−3.76 (1.66)*	.47
[Pre to follow-up slope]												
• ICBT versus FCBT	−2.04 (1.58)	.28	−1.45 (2.06)	.16	.89 (1.73)	.11	1.52 (1.76)	.22	1.45 (2.07)	.17	−1.67 (1.86)	.21
[Post to follow-up slope]												
• Control slope (FESA)	−.11 (1.35)	.02	1.02 (1.75)	.11	1.06 (1.46)	.13	−.22 (1.54)	.03	1.10 (1.89)	.13	−.85 (1.66)	.11
• FESA versus ICBT	.07 (1.75)	.01	2.10 (2.27)	.23	.96 (1.90)	.12	3.56 (1.99)+	.52	.43 (2.39)	.05	−.67 (2.11)	.08
• FESA versus FCBT	.03 (1.77)	.00	−.83 (2.29)	.09	1.89 (1.92)	.24	3.25 (2.03)	.47	.08 (2.43)	.01	1.41 (2.14)	.18
• ICBT versus FCBT	−.05 (1.59)	.01	−2.93 (2.08)	.33	.93 (1.75)	.12	−.30 (1.83)	.04	−.35 (2.12)	.04	2.09 (1.89)	.26
Random effects												
Level 1: residual variance	22.24		37.41		25.82		22.69		30.65		23.95	
Level 2: intercept variance	29.46		43.11		35.89		24.62		42.44		40.20	

Note: Analyses reported within square brackets indicate additional mixed models conducted to enable all comparisons to be reported. These analyses resulted in different intercepts.
* $P < .05$.
** $P < .01$.
*** $P < .001$.
+ $P < .10$.

4. Discussion

The current results expand upon earlier research by providing evidence that CBT and variants of CBT can be effective, at least in part, in treating phenomena frequently associated with anxiety (e.g., depressive symptoms) and in improving adaptive functioning. Importantly, the results indicate that individual (child) CBT and child-focused family CBT have comparable effects, and the results further suggest that a family-based supportive psychosocial intervention has comparable effects. Although one might interpret these results as indicating that all treatments were similar in their effects, the prior report of differential outcomes on the primary measures (Kendall et al., 2008) would contradict such a conclusion. Nonetheless, the current study is the first we know of to compare CBT variants and a non-CBT psychosocial treatment on phenomena typically associated with anxiety.

With respect to depressive symptoms, the present results are consistent with previous reductions in symptoms at posttreatment (e.g., Manassis et al., 2002; Silverman et al., 1999). The mechanism responsible for the reduction of depressive symptoms was not examined. Although targeting anxiety, many therapeutic activities may have addressed both anxious and depressive symptoms. A major component of anxiety treatment involves practicing skills learned during therapy in real-life situations. Practicing skills often involves interacting with others and engaging in pleasant activities, both of which are components of treatments for depression. However, youth in FESA also reduced depressive symptoms, and they were not required to increase their interactions with others or engage in activities outside of therapy. An alternate explanation might be that, as anxiety lessened, youth began to feel more confident, which was associated with a concomitant decrease in depression. Kendall et al. (2008) reported that youth in ICBT and

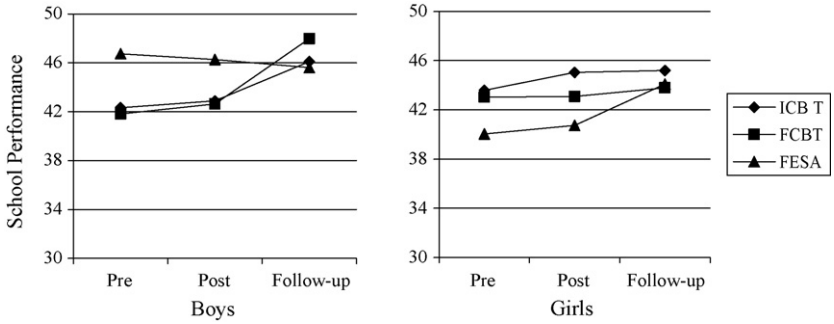

Fig. 2. Condition × Time × Gender interaction for mother-reported school performance at pretreatment (pre), posttreatment (post), and follow-up for youth in individual cognitive-behavioral therapy (ICBT), family-based cognitive-behavioral therapy (FCBT), and family-based education, support, and attention.

FCBT made greater gains on clinician-reported diagnostic outcomes than children in FESA, so it could be that a reduction in depressive symptoms followed the significant decline in anxiety. Although the mechanism of change requires further study, the finding that depressive symptoms lessen after anxiety treatment is a meaningful one.

Consistent with previous research (e.g., Barrett, 1998; Kendall, 1994) improvements were found on mother- and father-reported externalizing behavior. Though it may be reasonable to see how anxiety reduction might contribute to youth's overall sense of well-being and decreased depressive symptoms, it is less apparent why anxiety treatment would reduce externalizing behavior. As anxiety lessened, did externalizing problems do likewise? Perhaps another notion is reasonable. Consider the anxiety-disordered child who is made, by a parent, to face his/her fear. In response to such demands the child may become distressed and protest (externalize). Previous research (Suveg & Zeman, 2004) found that anxious youth engage in dysregulated methods of emotion management in response to provocative situations, providing some support to this potential explanation.

One other randomized clinical trial found posttreatment outcomes on teacher-reported externalizing symptoms (Kendall, 1994). The present results are inconsistent with those results. What might explain the differences? Perhaps the improvements noted in the home setting did not generalize to the school setting. Alternatively, perhaps the improvements in anxiety led parents to rate children as "globally" improved. Finally, an examination of teacher mean scores suggests that the majority of youth were exhibiting externalizing behavior that was within the normative range (i.e., T score < 65). Perhaps the scores were not severe enough to evidence a significant reduction at posttreatment. Given that only two studies examined teacher-rated externalizing behavior and the findings are inconsistent, further assessment is necessary.

Adaptive functioning was assessed by considering the number of activities the youth participated in, social functioning with peers, and their school performance. With respect to the former, the only significant finding was that fathers reported youth engaging in more activities from the posttreatment to follow-up. The number of activities in which youth participate should be reliably reported across parents. However, variability was noted and may have been linked to whether the informants viewed an activity as meaningful enough to list. As only one difference, this may have been due to chance.

Social competence served as a proxy for adaptive functioning. Previous research found correlations between reductions in clinician- and child-reported anxiety symptoms and child-reported social acceptance and between parent-reported child anxiety and parent-reported social competence but not between child-reported anxiety symptoms and parent-reported social competence (Wood, 2004). Findings were not moderated by age or gender. Thus, the one study to report on children's anxiety and social functioning had results that varied by reporter. The present findings also varied by informant. Mother-reported social competence yielded a significant interaction from posttreatment to follow-up where girls in ICBT and FCBT evidenced greater gains in social competence than did girls in FESA. It could be that mothers are especially attuned to girls' social functioning and thus noticed and reported on any improvements. Fathers, however, reported that younger children across conditions evidenced improved social competence from pretreatment to follow-up.

Prior research on school performance found relations between improvements in parent-rated school performance and child- and parent-reported decreases in youth anxiety (Wood, 2004). In this study, results varied by reporter. Based on mother report of school functioning, boys in ICBT and FCBT evidenced greater gains from pre and posttreatment to follow-up than did youth in FESA. However, father report yielded a Time by Age interaction where younger youth demonstrated greater gains from pretreatment to follow-up than did older youth. Thus, gains were found, though in different groups based on reporter.

Potential limitations are noted. First, the sample was relatively homogenous with respect to ethnicity. Preliminary research suggests that anxiety treatments are applicable with Hispanic/Latino youth (Pina et al., 2003). Though multiple informants were included, reports were based on individuals' perceptions of behavior, as opposed to observations. The study compared two variants of a family approach to treating anxious youth. Research needs to examine whether the many variants of CBT, particularly family-based, are differentially effective. Last, the FESA condition used in this present study, although intended to be a non-CBT approach, was found to contain a meaningful amount of CBT content (see Kendall et al., 2008). Thus, conclusions of the present study regarding the efficacy of other educational/supportive (psychosocial) approaches must be tempered.

Though limitations are noted, the relatively coherent pattern of findings suggests that when treating youth with anxiety, therapists can also expect improvements in associated symptomatology. In particular, the results here in combination with those reported previously, suggest that both individual- and family-variants of CBT can be effective in treating child depressive symptoms, externalizing symptomatology, as well as improving adaptive functioning. The current study also found a third treatment option to be equally effective as traditional CBT approaches. However, recall that FESA was found to contain a significant amount of CBT and therefore, it is not clear what about the treatment condition made it effective in alleviating secondary symptomatology and improving adaptive functioning. Future research could examine mechanisms of therapeutic change. Examination of longer-term outcomes will help determine whether the improvements noted on secondary outcomes are lasting.

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