DO CHANGES IN COPING AND THE THERAPEUTIC ALLIANCE IN CBT FOR

YOUTH ANXIETY DISORDERS PRECEDE AND PREDICT SUBSEQUENT

SYMPTOM IMPROVEMENT?

by

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ABSTRACT OF THE THESIS

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The study investigated the temporal pattern of change between engagement and disengagement coping, the therapeutic alliance and symptoms in cognitive behavioral therapy (CBT) for youth with anxiety disorders. Data from an ongoing sixteen-week CBT program for youth with anxiety disorders were analyzed in this study. Paired sample t-tests showed that anxiety symptoms, coping and alliance changed significantly over treatment. Hierarchical regression analyses revealed that reductions in disengagement coping and anxiety were associated over the first half of treatment (by both parent and child report). Changes in engagement coping over the first half of therapy were inconsistently related to symptom change. Changes in the therapeutic alliance by midtreatment did not predict symptoms at any time point. If trends continue, they could indicate that disengagement coping is more important to long-term symptom improvement than engagement coping.

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Do Changes in Coping and the Therapeutic Alliance in CBT for Youth Anxiety Disorders

Precede and Predict Subsequent Symptom Change?

Anxiety disorders, which have point prevalence rates among school-aged children between 12 and 20%, are one of the most common and debilitating psychological problems of childhood (Cohen et al., 1993; Costello, Egger & Angold, 2005). Anxiety disorders produce significant interference in childhood functioning in the realms of social adjustment, family relationships, and academic work (Chansky & Kendall, 1997). They also impede long term functioning as they have a chronic course that does not remit with the passage of time (Keller, Lavori, Wunder, Beardslee, Schwartz, & Roth, 1992). Youth anxiety disorders may worsen over time without treatment (Barrett, Dadds, & Rapee, 1996) and persist into adulthood (Baer & Garland, 2005; Rapee & Barlow, 1993) Anxiety disorders of youth are additionally burdening as they are frequently comorbid with other disorders, such as depression and attention deficit hyperactivity disorder (ADHD; Brady & Kendall, 1992), and have been associated with increased risk for adult depression and substance abuse (Kendall, Aschenbrand, & Hudson, 2003).

Although many children and adolescents with debilitating anxiety disorders improve significantly during and after treatment, a proportion of youth do not make considerable gains (Kendall, 1994; Barrett, 1998). In addition, further progress could be made in even those children who have notably reduced their symptoms. Because of the prevalence, chronic course, severity and long-term prognosis of youth anxiety disorders, as well as the limitations of the current interventions, improving treatment for youth anxiety disorders is essential. Efficacious youth interventions may be enhanced through the identification and strengthening of processes important to recovery.

Efficacious treatment of child and adolescent anxiety disorders

Cognitive behavioral therapy (CBT) for youth anxiety has been successful in significantly reducing symptoms of youth anxiety disorders. Treatment studies of youth anxiety disorders have consistently shown improvements in CBT conditions compared to wait list control (Kendall, 1994; Kendall, Flannery-Schroeder, Panichelli-Mindel, Southam-Gerow, Henin, & Warman, 1997). In two randomized clinical trials of CBT, Kendall and colleagues found that over 64% of the 9 to 13-year-old child participants assigned to CBT no longer met criteria for their primary anxiety disorder at posttreatment (Kendall, 1994; Kendall, Chu, Pimental, & Choudbury, 2000; Kendall et al., 1997). In contrast, only one or two of the children in the wait list conditions did not qualify for their primary anxiety diagnosis at posttreatment. CBT has also been shown to reduce symptoms significantly more than other treatments. Durham, Murphy, Richard, Treliving, & Fenton (1994) compared youth CBT to analytic psychotherapy and anxiety management training for childhood generalized anxiety disorder (GAD) and found CBT to be the most effective treatment.

Results from clinical trials also reveal the accomplishments of CBT across a range of anxiety disorders and participant ages (Kendall, 1994; Barrett et al., 1996). Barrett and colleagues investigated CBT for youth with anxiety disorders in two randomized clinical trials of children aged 7 to 14 with separation anxiety, overanxious disorder, or social phobia. Children were assigned to one of two CBT conditions or a waitlist control condition. In both trials, significantly fewer children in the two CBT conditions met criteria for an anxiety disorder at posttreatment than children in the waitlist condition (Barrett et al., 1996; Barrett, 1998).

Gains made during CBT for youth anxiety are not only significant, but are maintained at follow up (Spence, Donovan, & Brechman-Toussaint, 2000; Kendall, 1994; Kendall et al., 1997). In a treatment study of youth with social phobia by Spence et al. (2000), children assigned to conditions with CBT had significant decreases in their social and general anxiety in comparison to waitlist at posttreatment, and maintained their improvements at 12-month follow up. Children in the CBT condition of the two randomized clinical trials by Kendall and colleagues maintained their improvements at 12-month follow up, as well (Kendall, 1994; Kendall et al., 1997).

Evidence has also been presented that CBT is efficacious in different settings (Bernstein, Layne, Egan, & Tennison, 2005) and treatment study designs (Howard & Kendall, 1996). Children in both CBT treatments (group CBT and group CBT with parent training) in a school-based intervention for anxious children aged 7 to 11 showed significant improvement compared with the control group (Bernstein et al., 2005). CBT has been shown to significantly reduce symptoms in multiple-baseline, single-case design studies in addition to randomized clinical trials (Howard & Kendall, 1996; Barrett, 1998).

Thus, there is wide-ranging evidence of the significant impact of CBT on youth anxiety symptoms across anxiety disorders, age ranges, treatment settings and study designs. Many of the aforementioned treatment studies of child anxiety make use of the Coping Cat, a 16-session CBT treatment program for youth anxiety disorders developed by Kendall and colleagues (e.g., Kendall, 1994; Kendall et al., 1997; Howard & Kendall, 1996; Bernstein et al., 2005; Barrett, 1998; Barrett et al., 1996). Individual CBT programs, such as the Coping Cat, meet the criteria established by the APA Task Force on Promotion and Dissemination of Psychological Procedures (1995) for "probably

efficacious" treatments for youth anxiety and phobic disorders (Davis & Ollendick, 2005; Kendall et al., 2000), further substantiating CBT as a beneficial treatment for youth anxiety disorders.

Mechanisms of change and how to study them

Because the outcomes for CBT have received significant support, it is a reasonable time to conduct more in-depth analyses of the mechanisms through which CBT produces change. A mechanism of change is a variable that produces change in a successful treatment (Weersing & Weisz, 2002). The identification of mechanisms through which efficacious youth interventions bring about change is an essential area of research. Numerous researchers have emphasized the importance of not only understanding what treatments work, but also how they work (Kazdin, 1999; Weersing & Weisz, 2002). In fact, Hyman (2000) stated that the mechanisms through which treatments work is one of the central questions for psychiatry for the next millennium. Youth psychotherapy investigators theorize that research on mechanisms of change will be beneficial for several reasons. The detection of the crucial elements of therapy could allow for the development of more powerful interventions (Doss, 2004; Kraemer, Wilson, Fairburn & Agras, 2002). Also, gaining knowledge about the mechanisms of action in treatment could greatly contribute to the understanding of clinical disorders since processes important to recovery may also be factors in the maintenance of disorders (Kraemer et al., 2002).

In addition, the identification of mechanisms of change could result in the development of more efficient interventions that contain only the essential components of therapy, and the creation of shorter and more flexible manuals (Kazdin, 2001).

Furthermore, providing evidence of the way that change occurs in therapy might reduce opposition to manualized treatments in community treatment settings and improve therapy effectiveness in community clinics (Hunsley & Rumstein-McKean, 1999; Shirk & Russell, 1996).

Investigators have begun to use different methods to answer the question of how treatments work, one of which is conducting mediation analyses. These analyses involve a series of tests that determine if a particular variable accounts for change between the independent variable (IV) and the dependent variable (DV; Baron & Kenny, 1986). In psychotherapy research, typically the IV and DV are treatment and outcome, respectively.

In the search for understanding of how improvement occurs in youth treatment, investigators have used methods that do not involve formal mediation tests. Some researchers have simply compared changes in symptoms and changes in potential mediators at two explicit time points, frequently pre-treatment and posttreatment (Heyne et al., 2002; Flannery-Schroeder & Kendall, 2000). A small number of investigators have evaluated change in potential mediators and symptoms multiple times through treatment and compared early change in the potential mediator to later change in symptoms (DeRubeis, Evans, Hollon, Garvey, Grove, & Tuason, 1990; Loeb et al., 2005).

These latter methods do not establish mediation or clear causality of symptoms. However, identifying that change has occurred in a potential mediator before change has occurred in symptoms suggests a causal relationship. Judd and Kenny (1981) observed that temporal precedence is one of the three necessary conditions for causality, which also include covariation of the variable and symptom change and nonspuriousness

(Feeley, DeRubeis, & Gelfand, 1999). Unfortunately, even though temporal precedence

provides support for causation, it is not often used in the design of mediation studies

(Feeley et al., 1999). The abovementioned approaches exemplify techniques used by

researchers to detect relationships between potential mediators and symptoms.

Coping change as possible mediator in CBT

Coping may be a mediator of change in CBT for youth anxiety disorders. One of

the main theories underlying the Coping Cat treatment is that enhancing coping skills will

cause anxiety to decrease, and one of the primary aims of the Coping Cat is to alter

certain coping strategies in children with anxiety disorders (Kendall et al., 2000). Indeed,

the first half of the 16-week treatment teaches skills that aim to build a "coping template"

through which the child can adaptively process new learning experiences. The coping

strategies taught in the program are directed toward the stressor or toward responses to

the stressor (engagement coping). The program strives to reduce or eliminate strategies

that direct attention away from the stressor, such as avoidance (disengagement coping).

Some of the interventions used in the first half include identification of anxious thoughts

and developing coping thoughts, active problem solving, and relaxation techniques. The

second half of the program is devoted to managing anxiety-provoking situations in vivo

using the coping skills learned earlier in treatment (Kendall et al., 2000). Although

dismantling studies of CBT treatments for youth anxiety have not yet been conducted, the

success of the Coping Cat suggests that coping may be an important factor that mediates

ultimate outcomes in CBT.

Coping definitions and models

Coping has been defined as "any and all responses made by an individual who encounters a potentially harmful outcome" (Silver & Wortman, 1980, p. 281). These include such varied processes as managing emotions, thinking constructively, regulating behavior and controlling autonomic arousal (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Because of the diversity of responses to stress, coping has been conceptualized and categorized in many different ways by researchers. Some of the major dimensions through which coping researchers understand and classify coping strategies will be discussed here. The coping dimensions that will be pursued in this study will also be identified.

One dimension through which many researchers distinguish coping is voluntary and involuntary responses to stress (Compas et al., 2001; Skinner & Wellborn, 1984; Skinner, 1995; Eisenberg, Fabes, & Guthrie, 1997). Voluntary responses to stress are purposeful and under conscious control, with the aim of regulating an individual's reaction to stress. Involuntary responses to stress are automatic, may or may not be under conscious control and may be conditioned or temperament-based (Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000).

A second dimension researchers use to differentiate coping strategies is engagement or disengagement from a stressor or reactions to a stressor. Engagement responses are directed toward the stressor or one's responses to the stressor. Disengagement responses are directed away from the stressor or one's responses to the stressor. Disengagement coping has been called avoidance by Ayers, Sandler, West, and Roosa (1996) and passive coping by Walker, Smith, Garver, and Van Slyke (1997).

Voluntary engagement coping strategies are further sub-divided though an additional dimension, primary and secondary control strategies (Connor-Smith et al., 2000). Primary control coping strategies aim to alter objective conditions through such techniques as problem solving. Secondary control coping strategies aim to adjust to the problem through acceptance or cognitive restructuring (Compas et al., 2001; Connor-Smith et al., 2000).

Confirmatory factor analyses have suggested that three of these coping groups should continue to be considered closely in conceptualizing coping (Ayers et al., 1996; Walker et al., 1997; Compas et al., 2001). The first two groups fall under the broader coping category of engagement coping, and are primary control and secondary control coping. The third coping area deemed important for future investigation is disengagement coping (Compas et al., 2001). This study will further investigate the two broad categories deemed important in conceptualizing coping, engagement and disengagement coping. The study will employ the Responses to Stress questionnaire (RSQ; Connor-Smith et al., 2000), which assesses how frequently youth employ engagement and disengagement coping strategies.

How coping may mediate change in youth CBT for anxiety

Examination of the structure of fear as conceptualized by Lang (1977) sheds light on how coping may mediate change in CBT for youth anxiety. Lang (1979) proposed that fear is represented in the fear structure, which is comprised of information about the feared stimuli, information about cognitive, physiological and behavioral responses, and information about the meaning of the stimuli and responses. According to this model, when the fear network is activated by a feared stimulus, threat-related cognitions,

heightened physiological reactions, and escape and avoidance behavior occur. Normal fear is evoked through harmful circumstances and subsides when the danger passes, while pathological fear, which is theorized to be present in individuals with anxiety disorders, is evoked in harmless situations and results in intense and exaggerated responses (Foa & Kozak, 1986).

Foa and Kozak (1986) suggested that pathological fear could be treated through emotional processing, or activation of the fear network and the introduction of new and incompatible information about feared stimuli or responses into the fear structure (Lang, 1977). They proposed that after feared stimuli activated the fear structure, the new and incompatible information about the feared stimuli would strengthen new adaptive associations enough to compete with older pathological learning (Foa and Kozak, 1986). As a result, meaning change about the feared stimuli would occur, thus reducing avoidance and long-term fear and anxiety.

Coping strategies such as engagement and disengagement coping may mediate change in CBT by facilitating emotional processing in two ways. First, avoidance behavior (or disengagement) prevents a person from facing a feared stimulus, blocking the activation of the fear structure and the presentation of incompatible information about the stimulus or responses to the stimulus, two of the steps in emotional processing. Because meaning change will not occur without these processes, anxiety and the threatening meaning of the feared stimulus persist (Borkovec, 1994). Thus, avoidant coping prevents activation of the fear structure and may serve to maintain symptoms. In contrast, contact with feared stimuli (engagement) activates the fear structure and may mediate recovery in CBT.

Second, the introduction of incompatible information about responses to feared stimuli is another important component for meaning change to occur. Since the pathological responses to the feared stimulus comprise of escape and avoidant behavior, new and incompatible responses would include reduced avoidant behavior and increased approach behavior. Therefore, a second way that coping strategies may mediate change in CBT is by serving as incompatible responses, thereby weakening the association between feared stimuli and pathological responses, and strengthening the association between feared stimuli and incompatible responses.

Based on these theories, we would expect positive clinical outcomes to be mediated by a decreased use of disengagement coping strategies such as behavioral avoidance and wishful thinking. We would also expect outcomes to be mediated by the increased use of engagement strategies such as problem solving, challenging anxious thoughts, and approach behavior.

Coping styles and child and adolescent anxiety disorders

Coping has been considered a potential mediator of change in the CBT for youth internalizing disorders, including anxiety, in part because particular coping styles have been associated with emotional and behavioral problems. Specifically, engagement coping has been associated with fewer internalizing symptoms and disengagement coping has been associated with more internalizing symptoms (Compas et al., 2001).

Engagement coping and internalizing problems. There is supporting evidence for a relationship between engagement coping and fewer internalizing symptoms. Connor-Smith et al. (2000) found that primary and secondary control (engagement) coping strategies were associated with lower internalizing and externalizing problems in

adolescents aged 12 through 19 across four domains of stress. Specifically, the use of primary control coping strategies was associated with fewer externalizing problems, and the use of secondary control coping strategies was associated with fewer internalizing problems. These results indicate that adolescents who cope with the intention of adapting to the stressor do not suffer from as many internalizing problems, including anxiety. Causey and Dubow (1992) found that two types of engagement coping, problem solving and support seeking, were significantly related to better adjustment in fourth through sixth graders in terms of self-esteem and anxiety symptoms, and Eisenberg, Fabes, Bernzweig, Karbon, Poulin & Hanish, (1993) reported that constructive coping, an engagement coping strategy, was related to higher social skills and better adjustment in boys.

Furthermore, in a questionnaire study of pain, coping, and symptoms of anxiety and depression in children and adolescents with recurrent abdominal pain (RAP), Thomsen, Compas, Colletti, Stanger, Boyer and Konik (2002) found that both primary and secondary control coping were associated with fewer anxiety and depression symptoms. Thomsen et al. (2002) used path modeling to test the correlations found. A model of voluntary coping in which primary and secondary control coping were inversely related to anxiety and depression symptoms predicted 22% of the variance. These results strengthen the theory that engagement coping is related to youth anxiety and are consistent with a mediation theory of coping.

Wadsworth, Raviv, Compas, and Connor-Smith (2005) examined models of the association between economic strain, life stress, coping, involuntary stress responses, and psychological symptoms in 57 parent-child dyads from low-income families. Consistent

with prior results, they found that primary and secondary control (engagement) coping strategies were related to fewer psychopathology symptoms. Engagement coping predicted fewer internalizing and externalizing symptoms, providing further evidence of a relationship between engagement coping and anxiety. Finally, models of relationships between study variables were tested and secondary control (engagement) coping was shown to mediate the relationship between economic strain and internalizing and externalizing problems. The finding that coping mediates the relationship between stress and symptoms hints that coping may also play a mediating role in the relationship between treatment and symptoms.

Jaser et al. (2005) also found evidence that there was an association between engagement coping and fewer internalizing symptoms. Their results showed that secondary control coping was related to lower anxiety, depression, and aggression symptom levels in adolescents with family stress. They also found that secondary control coping mediated the relationship between parental intrusiveness and adolescent anxiety and depression, which is consistent with the theory that coping also mediates the relationship between treatment and symptoms. This pattern of results indicates that there might be a specific relationship between the use of engagement coping and fewer internalizing symptoms.

Disengagement coping and internalizing problems. There is also supporting evidence of an association between disengagement coping and internalizing problems in youth. Lengua and Sandler (1996) demonstrated a positive relationship between the disengagement strategy, avoidant coping, and problems with depression, anxiety and conduct in eight to twelve-year old children. Herman and McHale (1993) found that

disengagement strategies such as forgetting were associated with more anxiety symptoms in sixth and seventh graders. Sandler, Tein, and West (1994) reported that avoidance was related to more depressive and anxiety symptoms in a study of seven to thirteen-year old children.

Wadsworth and Compas (2002) found an association between disengagement coping and internalizing problems. They investigated the relationship between family economic problems, family conflict, adolescent coping responses, and adolescent adjustment using school lunch program enrollment information and adolescent survey data. They used structural equation modeling to test a model of coping as a mediator between economic hardship and adolescent anxiety, depression, and aggression. In the model tested, disengagement coping was associated with more adjustment problems. The pattern of findings described in this section suggests that there may be a specific relationship between disengagement coping and elevated internalizing problems.

Correlation between youth internalizing problems and coping. Studies of coping and psychopathology report that children who use engagement coping tend to have fewer anxiety and depression symptoms and children who use disengagement coping tend to have more anxiety and depression symptoms. It is important to note that even though the results suggest a relationship between engagement and disengagement coping and internalizing symptoms, this does not mean that it is a causal relationship. Since the reviewed studies used cross-sectional designs, in which coping and symptoms were assessed simultaneously, it is not possible to determine if coping style or symptoms developed first.

Another reason that the findings should be interpreted cautiously is because the participants in many of the studies did not have clinical disorders. Therefore, the relationship between coping and internalizing symptoms identified in sub-clinical participants may not exist in youth with *actual* internalizing disorders. Coping researchers have emphasized the importance of using prospective designs and clinical populations in future studies so that the association between coping and youth psychopathology can be more clearly understood (Compas et al., 2001). Cautions aside, the association between coping and internalizing symptoms supports the theory that coping is an important factor in CBT for youth anxiety disorders.

Does coping mediate outcome in CBT?

There have been 11 trials of CBT for youth anxiety that have assessed coping changes in treatment (Heyne et al., 2002; Flannery-Schroeder & Kendall, 2000; Ollendick, 1995; Howard & Kendall, 1996; King, Tonge, Heyne, Pritchard, Rollings & Young, 1998; Kendall, 1994, Kendall et al., 1997; Barrett et al., 1996; Barrett, 1998; Beidel, Turner, & Morris, 2000; Mendlowitz, Manassis, Bradley, Scapillato, Miezitiz, & Shaw, 1999). They have produced reliable evidence of an association between coping and symptom improvement. This is shown in that all CBT conditions in these studies produced significant improvement in anxiety symptoms at treatment outcome and all but one of the studies showed change in coping from pre-treatment to posttreatment (Beidel et al., 2000). These trials used a variety of treatment formats (randomized, controlled trials and multiple baseline, single case designs) and recruited a wide range of children (5 to 17 years old). Only one of the 11 studies compared CBT to an active, non-CBT condition (Heyne et al., 2002). Like the other studies, the results showed that coping and

symptom change were related at outcome. However, they also showed that the relationship existed in both the CBT and non-CBT conditions, suggesting coping might not be a specific mediator of change.

Further evidence of a consistent relationship between coping change over CBT treatment and symptom improvement comes from a review of 25 CBT studies for children with anxiety. Prins and Ollendick (2003) looked at the treatment effects and possible mediation of treatment effects on anxiety symptoms through cognition and coping. Nineteen randomized controlled trials and six studies with multiple baseline single-case design were identified in the period between 1987 and 2002. Only seven of the randomized controlled studies assessed coping from pre-treatment to posttreatment. In the six trials with wait list conditions, the CBT conditions were superior in both symptom improvement and coping enhancement. In addition, the coping measures in the reviewed studies comparing CBT to wait-list had large (1.26) and medium (.65) between-group mean effect sizes for the parent and child report versions, respectively (Prins & Ollendick, 2003). However, the effect size for parent coping measures should be interpreted cautiously because it was based on only two studies.

Although the association between coping and symptoms has been shown to be reliable across treatment formats and age ranges, an important characteristic of the youth CBT studies that have assessed coping is that they largely assess coping at only two time points, pre-treatment and posttreatment. This procedure prevents researchers from discerning whether coping change precedes or follows symptom change. The multiple baseline study of CBT for youth anxiety disorders by Howard & Kendall (1996) is one exception to this general trend. Their study investigated treatment-related gains through

weekly assessments of coping efficacy and assessments of anxiety symptoms at pretreatment, midtreatment and posttreatment. Results indicated that coping efficacy and anxiety symptoms improved significantly between pre-treatment and posttreatment. Inspection of the graphic display of coping change over treatment illustrates a pattern in which coping changed the most in the middle and over the second half of treatment according to parent and child report. On the other hand, inspection of mean anxiety levels at pretreatment, midtreatment and posttreatment indicates that anxiety symptoms reduced steadily over treatment according to parent report, and in an unclear pattern according to child report (Howard & Kendall, 1996). Although these results suggest that symptoms may change prior to coping, the low sample size (6) of the study prevents firm conclusions from being drawn about the pattern of coping and symptom change across treatment. Studies similar to this one that examine the pattern of coping and symptom variation at multiple points over treatment (with an increased sample size) may better discriminate the order of change than analysis of the variables at only two assessment points.

Another general characteristic of the studies that have assessed coping across CBT for youth anxiety is that change in the child's perception of the child's coping ability, rather than change in coping strategies, was usually examined. Nine studies assessed for coping efficacy in individualized anxiety provoking situations and school-related stressful situations (Heyne et al., 2002; Flannery-Schroeder & Kendall, 2000; Ollendick, 1995; Howard & Kendall, 1996; King et al., 1998; Kendall, 1994, Kendall et al., 1997; Barrett et al., 1996; Barrett, 1998), and found coping efficacy to be significantly and positively related to symptom improvement. Coping efficacy was

assessed in these studies using the Coping Questionnaire-Child (CQ-C; Kendall, 1994), the Coping Questionnaire-Parent (CQ-P; Kendall, 1994), or the Self-Efficacy Questionnaire for School Situations (SEQ-SS; King et al., 1998). Although significant, these study findings do not show what in particular changed about coping to produce the perception of efficacy.

On the other hand, changes in the use of specific categorized coping strategies has not been assessed as frequently. Mendlowitz et al. (1999), Barrett (1998), Barrett et al. (1996) were the only CBT studies for youth anxiety that measured change in specific coping strategies, such as in active coping, avoidant coping, distraction, or support. They employed the Children's Coping Strategy Checklist (CCSC; Sandler & Ayers, 1990) and direct questions about avoidant behaviors to assess change in coping strategies over treatment. Overall, their findings showed that increased engagement coping and decreased disengagement coping were associated with symptom improvement (Mendlowitz et al., 1999; Barrett, 1998; Barrett et al., 1996). Additional research on changes in the use of particular coping strategies over the course of treatment may be a revealing enterprise, in that it may identify more specific pathways through which youth experience improvements.

A clear association between symptom improvement and coping change in CBT for youth anxiety has been demonstrated in studies using varying treatment formats and a wide age range of youth. Only a handful of the CBT studies that assessed youth coping have examined change in specific coping strategies over treatment, and only one has produced information about the sequence of coping and symptom change over multiple

time points of treatment. Such research may lead to a better understanding of the patterns of change in youth anxiety recovery.

Methodological limitations in studying mediation in youth CBT

One of the largest problems in research of mediators and mechanisms of change in CBT is that is rarely done (Weersing & Weisz, 2002). Kazdin, Bass, Ayers, and Rogers (1990) found that less than three percent of published clinical trials included measures of potential mediators. Weersing and Weisz (2002) found that of five cognitive-behavioral empirically supported treatments for anxious and phobic youth, all five used cognitive and behavioral measures. However, only one study performed a mediation test (Treadwell & Kendall, 1996). Although measures of cognitive and behavioral symptoms are increasingly used in treatment studies, few studies actually complete mediation tests (Weersing & Weisz, 2002).

In those studies that do complete analyses of mediators or mechanisms of change, there are significant methodological problems. One difficulty with clinical trials that have applied tests of mediation is that they infrequently make assessments about candidate mediators, typically only at pre-treatment and posttreatment (Weersing & Weisz, 2002). The timing and frequency of assessment that is employed by most studies, including the abovementioned CBT studies of coping and youth anxiety, makes it is impossible to detect the order in which hypothetical mediators and symptoms transform (Prins & Ollendick, 2003).

The order of change between variables is important in the study of causality because a variable simply cannot cause change in another variable if it does not change first (Feeley et al, 1999; Judd & Kenny, 1991). Accordingly, the establishment of the

order of change is an initial step in ascertaining the causal role of potential mediators in symptom change. The sequence of change could be studied through the use of multiple assessment points in studies. This technique would allow researchers to examine the pattern of change between potential mediators and symptoms over the course of treatment, establishing temporal precedence between them (Prins & Ollendick, 2003). In addition to discerning if change in hypothetical mediators precedes and accounts for change in symptoms, this assessment procedure would also control for past symptoms.

An additional problem with limited assessments in treatment studies is that the assessments may not fall during an optimal time for measurement. Weersing & Weisz (2002) suggest that measurements be made early enough in treatment to establish the temporal precedence between mediator and symptom change. However, they also warn that measurements not be made too early in therapy because any change in a potential mediator may be too minimal at that point to be measured. Multiple measurements of both mediator and symptom change throughout therapy may help to correct this problem, as well. (Weersing & Weisz, 2002).

The therapeutic alliance in CBT

Another important process in CBT for youth anxiety may be the therapeutic alliance. The therapeutic alliance is a concept that was generated from several understandings of the client –therapist relationship. The diverse terms used to refer to the alliance (e.g., helping alliance, therapeutic relationship, working alliance, therapeutic bond) reflect the varied ways it is thought of and understood (Chu, Choudhury, Shortt, Pincus, Creed, & Kendall, 2004). Across theoretical orientations, there appears to be a consensus that three general factors contribute to the alliance: affective bond between the

therapist and the client, agreement and collaboration on therapy tasks, and agreement on treatment goals (Bordin, 1979).

Some therapy researchers feel that the therapeutic relationship is more important in children than it is in adults (Shirk & Saiz, 1992). Since children don't refer themselves to therapy, may not acknowledge that there are problems, and may disagree with their parents on therapy goals, creating a strong therapeutic alliance may be critical to treatment success (Shirk & Karver, 2003; DiGuisseppe, Linscott & Jilton, 1996; Shirk & Saiz, 1992). Establishing a positive therapeutic alliance may also be difficult, and crucial, because adolescents are at a developmental stage when they are striving for independence from adults (DiGuiseppe et al, 1996).

Therapeutic alliance and child treatment outcome

There are very few studies that address the association between the therapeutic alliance and treatment outcome in child therapy (Shirk & Karver, 2003). This is in spite of the fact that the therapeutic relationship has been viewed as a significant mechanism of change in the psychodynamic child psychotherapy tradition for many years (Freud, 1946). CBT and behavioral therapy have only more recently turned their attention to the therapeutic relationship (Shirk & Karver, 2003).

Through a meta-analytic review of 23 studies, Shirk & Karver (2003) found that the child-therapist relationship was related to outcome across development, type of treatment and treatment context (overall effect size = .21). The child alliance effect size calculated was comparable to the effect sizes calculated in the adult alliance-outcome meta-analyses (Shirk & Karver, 2003; Horvath & Symonds, 1991; Martin, Graske, & Davis, 2000). Later alliance was more closely related to treatment outcome than earlier

alliance in child therapy. This differs from the finding in the adult literature that early alliance has the strongest relationship with outcome (Shirk & Karver, 2003; Horvath & Symonds, 1991). There was a stronger association between the therapeutic alliance and outcome in children with externalizing disorders than in those with internalizing disorders. It is important to note, however, that this review was comprised of a low number of studies, which limits firm conclusions from being drawn.

Studies of child alliance have produced minimal evidence on the direction of the relationship between alliance and outcome due to the timing and infrequency of assessment points. Measures of the therapeutic alliance in child therapy are often completed near or at the end of therapy (Shirk & Karver, 2003). Unfortunately, symptom improvement is likely to have occurred by this point, and children who have improved are more likely to view the therapy and the therapist favorably by this point. Thus, alliance scores measured at the end of therapy may artificially inflate the child alliance-outcome association. Infrequent assessments of child alliance and symptoms also impede understanding of the direction of change because of the difficulty of inferring causation from measurements at only one or two time points.

As a result of the difficulties interpreting the directionality between alliance and outcome, researchers have recommended that alliance measures be completed well before outcome and at multiple time points throughout therapy (Shirk & Karver, 2003; Barber, Connolly, Crits-Christoph, Gladis, & Siqueland, 2000). Repeated ratings of alliance over many time points in therapy may elucidate if the formation of a good alliance precedes symptom improvement in time, revealing the direction of effect between alliance and outcome. In addition, assessments of alliance and symptom measures at earlier time

points in therapy could allow researchers to examine the alliance-outcome relationship at points before symptoms have improved, which would strengthen the impact of any significant findings.

Because a significant relationship has been shown between the therapeutic alliance and outcome in the treatment of child psychological disorders, this study will examine changes in alliance and symptoms over the course of treatment.

Study objectives

This study aims to evaluate the time-lagged relations between coping, alliance, and symptoms for children in CBT for anxiety disorders. The results will be a descriptive assessment of the hypothesized relationships between the variables. Mediation and causality cannot be directly addressed in this study because of design issues. Without a control group, we are unable to rule out the possibility that another factor caused any of the associations found. However, patterns of temporal precedence and prediction may provide support for theories of mediation change. This is because change in one variable cannot cause change in another variable unless it occurs first (Feeley et al., 1999).

A pattern of results in which coping change precedes and predicts symptom change would be consistent with a coping model of mediation, and a pattern of results in which alliance precedes and predicts subsequent symptom level would be consistent with an alliance model of mediation. On the other hand, a pattern that establishes temporal precedence or prediction of symptom change over coping and alliance would challenge the coping and alliance theories of mediation and the coping theory of change underlying CBT.

In sum, despite the fact that this study cannot speak to mediation or causality, it may provide additional corroboration for coping and the alliance as important processes in therapy by revealing temporal patterns of change. Conversely, it could provide preliminary disconfirming evidence for the coping theory of change underlying CBT. In the latter case, results could also signify that coping is a less important candidate mediator to pursue.

When to assess symptoms, coping and alliance?

Because this study will use hierarchical regression analysis, it is necessary to make priori hypotheses about when the critical moments of change will occur. In the child anxiety domain, the literature provides few clues about when symptom or coping change is expected to occur during CBT. This is primarily related to the relatively few studies that assess symptom and mediator change throughout therapy. However, Wood, Piacentini, Southam-Gerow, Chu & Sigman (2006) found that youth anxiety symptoms did not decrease significantly by midtreatment. Also, Kendall et al. (1997) found that clinically significant change did not occur in the first half (eight weeks) of CBT for youth anxiety. Because the limited literature on the course of symptom change in treatment suggests that changes will not be evident until later in therapy, we will assess symptom level at sessions 8, 12, and posttreatment.

Few studies have produced evidence on the critical periods for coping change. In the only study of CBT for youth anxiety that measured coping repeatedly throughout treatment, much of the coping changes occurred somewhere between midtreatment and posttreatment (Howard & Kendall, 1996). Their finding suggests that measurement of coping should be done later. At the same time, coping strategies are taught in the first half

of the Coping Cat (sessions 1-8). Thus, we might expect to see evidence of coping change early in treatment. Because of these conflicting findings, we will assess coping change at midtreatment: session 8. Finally, some studies have found that symptom change has predicted changes in hypothesized mediators rather than the reverse (Barber et al, 2000). In light of these findings, we will also assess symptom level at midtreatment and coping at sessions 8, 12, and posttreatment.

Few studies have addressed the relationship between alliance and symptoms over time or specified important time points to assess alliance during therapy. In a meta-analysis of the small amount of studies that have assessed alliance and outcome, Shirk & Karver (2003) found that alliance had a stronger relationship with outcome at later points in therapy than in early points. For example, Florsheim, Shotorbani, Guest-Warnick, & Barratt (2000) found that early scores of the alliance (at three weeks) in delinquent boys were not related to positive treatment outcome. However, measures of the alliance at midtreatment (after 3 months) were associated with decreased symptoms and better outcome. The preliminary results indicate that midtreatment alliance and at points later in treatment may be more important to outcome than early alliance in child therapy. Based on these findings, we will make one assessment of the therapeutic alliance at midtreatment (session 8).

Hypotheses

Based on the results of previous treatment studies, we hypothesize that anxiety symptoms will decline and the therapeutic alliance will improve significantly in children and adolescents with anxiety disorders during CBT. Due to the results of prior studies about coping change in CBT, we hypothesize that engagement coping will increase

significantly and disengagement coping will decrease significantly during CBT for children with anxiety disorders.

Because previous studies have identified a relationship between changes in coping and alliance and symptom improvement, we hypothesize that increases in engagement coping, decreases in disengagement coping, and improvement in the therapeutic alliance will be associated with symptom improvement throughout treatment. Finally, we hypothesize that increases in engagement coping, decreases in disengagement coping and improvements in the therapeutic alliance over the first half of treatment will precede and predict subsequent symptom enhancement in CBT for youth anxiety disorders. These findings would support the coping and alliance models of symptom improvement. We also hypothesize that symptom improvement over the first half of treatment will not precede and predict changes in coping and alliance.

<div align="center">Methods</div>

Participants

Sample characteristics. Nineteen youth (ages 8-16 years, Mean=12.11, SD=2.23) diagnosed with a primary anxiety disorder served were included. Of the 19 children, 13 (68.4%) were boys and 6 (31.6%) were girls; 16 (84.2%) were Caucasian, 1 (5.3%) was African-American, 1 (5.3%) was Latino, and 1 (5.3%) was another ethnicity. In addition, 1 (5.3%) child was less than 9 years old, 6 (31.6%) were 9-11 years old, 9 (47.4%) were 12-14 years old, and 3 (15.8%) were 15-16 years old. Family income was less than $30,000 for 2 (10.5%), $30,000-$60,000 for 4 (21.1%), $60,000-$80,000 for 2 (10.5%), and greater than $80,000 for 4 (21.1%); income data were missing for 7 (36.8%) children. Of the nineteen children who completed intakes and began treatment, 18 have to date

completed session 4, 16 have completed session 8, 15 have completed session 12, and 14 have completed posttreatment.

All children met criteria for a primary anxiety disorder based on both youth and parent report during a semi-structured interview. Of the 19 children, 9 (47.4%) received a primary diagnosis of Generalized Anxiety Disorder (GAD), 2 (10.5%) with Separation Anxiety Disorder (SAD), 6 (31.6%) with Social Phobia (SP), and 2 (10.5%) with Panic Disorder (PD). Youth with a primary diagnosis of a DSM-IV disorder other than anxiety (e.g., Anorexia nervosa, Posttraumatic Stress Disorder, Attention Deficit-Hyperactivity Disorder), or who had received any diagnosis of mental retardation, a pervasive developmental disorder, schizophrenia, or bipolar disorder were excluded. Youth who demonstrated suicidal ideation or intent (by child or parent report) severe enough to require current hospitalization, or youth who had attempted suicide within the past year, were a excluded.

Measures

Measures assessed three domains: youth diagnosis, youth symptoms and psychological variables associated with youth anxiety disorders.

Anxiety Disorders Interview Schedule (ADIS-IV) – Child/Parent version. The ADIS-C/P (Silverman & Albano, 1996) is a semi-structured interview consisting of independent but comparable parent and child interviews that have good interviewer reliability (e.g., kappa= .98, parent interview; k=.93, child interview; Silverman & Nelles, 1988), retest reliability (i.e., r=.76, parent interview; Silverman & Eisen, 1992), and sensitivity to treatment effects (e.g., Kendall et al, 1997). The parent and child interviews were conducted individually allowing the diagnostician to derive parent-reported, child-

reported, and composite (parent and child) diagnoses. Diagnosticians were trained to reliability by coding videotaped interviews and matching gold-standard ratings of diagnoses (k ≥ .80).

State-Trait Anxiety Inventory for Children (STAIC) – Trait Scale: The STAIC (Spielberger, 1973) has two 20-item self report scales assessing both enduring tendencies to experience anxiety (A-Trait) and temporal and situational variations in anxiety (A-State). Factor-analytic studies support the state-trait distinction (Finch, Kendall, & Montgomery, 1974). The STAIC-Trait-P (Strauss; 1987) is a modified trait version of the STAIC to be used as a complementary parent rating of the child's trait anxiety. Evidence for both parent and child versions of the STAIC's discriminant and convergent validity has been reported (Hodges, 1990), and the Trait version of the STAIC correlates with other measures of anxiety in children (e.g., RCMAS; Carey, Faulstich, & Carey, 1994).

Responses to Stress Questionnaire—Youth (RSQ) and Parent (RSQ-P) Forms. The RSQ and RSQ-P (Connor-Smith et al., 2000) are 57-item measures that assess youth self-reports and parent-reports of the use of engagement and disengagement coping strategies in response to significant life stressors. In this study, the RSQ and the RSQ-P were administered to target youth responses to anxiety. Research with three samples of adolescents and parent reports in two samples (reporting on their adolescents) has shown good evidence for the psychometric integrity of the measure. The RSQ measures several coping dimensions including voluntary-involuntary, engagement-disengagement and primary control-secondary control coping. This study made use of the engagement-disengagement coping dimension. The factor structure of the RSQ has been tested and replicated using confirmatory factor analysis across three stressor classes in two samples.

Both internal consistency and retest reliability of the five factors are strong, across samples. Scores on the engagement coping factors have shown strong negative correlations with both internalizing and externalizing problems, and scores on the disengagement coping factors have shown positive correlations with internalizing and externalizing problems across samples (Connor Smith et al., 2000).

Therapeutic Alliance Scale for Children/Adolescents (TASC/TASA- therapist version). The TASC/TASA (Shirk & Saiz, 1992) are 12-item scales that assess the quality of youths' working alliance with their therapists. The youth measure has shown good internal consistency in a sample of 44 clinic-referred youth (alpha = .84), and good 7-14-day test-retest reliability (r=.65) in a sample of 16 clinic-referred youth. The parent measure has also shown good internal consistency in a sample of 47 parents of clinic-referred youth (alpha=.92), and good 7-14-day test-retest reliability (r=.82) in a sample of 25 parents of clinic-referred youth. The TASC/TASA will be used in this study to measure the therapeutic alliance from the perspective of the therapist. There is evidence that the therapist-reported alliance scores are more closely related to outcome than the child's (Shirk & Karver, 2003).

Procedures

Data for this study was collected as part of an ongoing open-trial of CBT at the Youth Anxiety and Depression Clinic (YAD-C) at Rutgers. Participants at YAD-C were referred through community sources (e.g., news ads, school counselors, child psychiatry departments). Families completed an initial phone screening and then were invited for an in-person diagnostic assessment where parent and child completed the ADIS, RCADS, RSQ, and STAIC-T.

Treatment Phase

Coping Cat. If a youth met criteria for a primary diagnosis for a clinical or subclinical anxiety disorder, she or he was assigned to the Coping Cat (Kendall, 2000). The Coping Cat was performed by advanced doctoral graduate students. The Coping Cat program, developed by Kendall and colleagues (Kendall, 1994; Kendall et al., 2000; Kendall et al., 1997) is a 16-session treatment that involves (1) teaching children to identify their own anxious feelings and physiological signs of anxiety, (2) teaching children to identify their own anxiety-provoking cognitions, (3) developing a plan to guide coping – a plan that involves changing the child's thoughts (into positive self-talk) and actions (into self-initiated exposures), and (4) self-evaluation and self-reward. The therapist uses modeling (e.g., revealing therapist's own anxiety and sharing successful coping experiences), in vivo exposure tasks, role-playing (e.g., to prepare for exposure tasks), relaxation training, and contingent reinforcement (e.g., for trying and for succeeding at exposure tasks), in developing these four themes.

The 16-session program is divided into two halves: The first 7-8 sessions involve training in the basic concepts outlined above; sessions in the last half involve practicing the skills, using imaginal and in vivo experiences. Session 1 focuses on rapport-building and on identification of the child's anxiety targets and characteristic physical responses to anxiety. Session 2 involves teaching the child to identify different types of feelings. Session 3 focuses on construction of a hierarchy of anxiety-provoking situations (in part to help identify more and less-challenging exposures (or "show that I can" [STIC] tasks) for later in treatment). Session 4 involves relaxation training, and children are provided with a personalized relaxation tape to use outside treatment sessions. In Session 5, the

child is taught to recognize his/her own anxious self-talk. In Session 6, coping strategies are presented, including the use of coping self-talk and verbal self-direction, and also including development of action plans. In Session 7, children are taught to self-evaluate and self-reward. And in Session 8, all the key concepts are reviewed. Sessions in the last half of the program involve imaginal and real-life exposure to feared situations. At first, low-level stressors are involved, but across sessions, exposure tasks involve increasingly anxiety-provoking situations. In the last few sessions, child and therapist discuss ways to apply the lessons learned to real life, outside therapy. The child also makes a videotaped "commercial" discussing the lessons learned in the treatment program.

Assessments

Diagnosis (ADIS-C/P) was assessed at intake and posttreatment. Coping change (RSQ and RSQ-P), therapeutic alliance (TASA, TASC) and symptom change (STAIC and STAIC-P) were assessed at pre-treatment, first session, every fourth session (interim assessment), and at posttreatment. Weekly anxiety outcomes (STAIC and STAIC-P) were assessed at the beginning of every session.

<div align="center">Results</div>

Hypothesis 1: Anxiety symptoms in children and adolescents with anxiety disorders will decline significantly during CBT. Paired sample t-tests were conducted to investigate changes in anxiety from intake to posttreatment. For youth with complete pre- and post-treatment data (n=14), parent-reported STAIC scores reduced significantly from pre- (M = 54.47, SD = 7.79) to posttreatment (M = 41.79, SD = 10.76), $t(13)$= -5.70, p<.001. For youth with complete pre- and post-treatment data, child-reported

STAIC scores reduced significantly from pre- (M = 57.32, SD = 11.52) to posttreatment
(M = 24.57, SD = 5.69), t(13)= -3.82, p<.01.

Hypothesis 2: Engagement coping will increase significantly and disengagement
coping will decrease significantly from intake to posttreatment. Paired sample t-tests
were conducted to investigate changes in coping from pre- to post-treatment. For youth
with complete pre- and post-treatment data (n=14), parent-reported engagement coping
increased significantly from pre- (M = 33.79, SD = 5.73) to posttreatment (M = 43.14,
SD = 10.33), t(13)= 4.15, p<.01. In youth with complete pre- and posttreatment data
(n=14), there was a trend toward decreased disengagement coping by parent report from
pre- (M = 20.00, SD = 5.70) to post-treatment (M = 17.43, SD = 4.78), t(13)= -1.88, p=
.082. There were no significant changes in child-reported engagement coping or
disengagement coping between pre- and post-treatment.

Hypothesis 3: The therapeutic alliance will improve significantly in children and
adolescents with anxiety disorders during CBT. Paired sample t-tests were conducted to
investigate changes in therapist-rated alliance from pre- to post-treatment in youth with
complete data from session one to the termination session (n=11). Alliance scores
improved significantly between pre- (M = 51.64, SD = 10.60) to post-treatment, (M =
58.82, SD =11.39), t(10)= 2.82, p<.05.

Hypothesis 4: Increases in engagement coping, decreases in disengagement
coping and increases in alliance will be associated with reductions in symptoms across
treatment. Session-by-session change was assessed for disengagement and engagement
coping, and anxiety symptoms (see Table 1). Session-by-session change for treatment
completers (n=14) was plotted in graphs (see Figures 1 and 2) to identify general trends

in data. Figure 1 illustrates the patterns of change in parent-reported child anxiety and coping and therapist-reported alliance. Parent-reported anxiety gradually declined over treatment, with a slight instability in the pattern of improvement at around midtreatment. Engagement coping slowly and steadily increased over treatment while disengagement coping minimally decreased through treatment.

Figure 2 demonstrates the patterns of change of child-reported anxiety and coping and therapist-reported alliance. Child-reported anxiety decreased slowly over the course of treatment approximating a linear shape. Engagement coping changed in an unclear fashion according to child report, rising and falling slightly and irregularly throughout treatment with a slight downward trend. Disengagement coping, by visual inspection, appeared to decline slightly over treatment by child report even though earlier paired t-tests suggested this change was not statistically significant. As shown in Figures 1 and 2, alliance appeared to increase from intake to posttreatment in an uneven manner. Mean alliance improved between sessions 1 and 5, dipped somewhat between sessions 6 and 8, increased again between sessions 9 and 11, dipped slightly between sessions 12 and 15, and ended at its highest mean score at the termination session.

By visual inspection, there did not appear to be any obvious patterns in the sequence of change among the variables. Coping did not appear to change prior to symptom improvements and symptoms did not appear to improve prior to changes in engagement and disengagement coping. A sequence of change between alliance and symptoms was not apparent by child report. According to parent report, there were possible patterns of change between alliance and symptoms during treatment. Firstly, symptoms decreased between sessions 1 and 2 and alliance changed only barely for the

worse (see Figure 1). After session 2, alliance and symptoms changed steadily in opposite directions throughout the rest of treatment. Secondly, alliance improved between sessions 9 and 11 as symptoms slightly worsened (see Figure 1). After the improvement in alliance, symptoms reduced between sessions 12 and 14.

Because change was linear, we chose pretreatment, midtreatment (session 8) and posttreatment as our major timepoints in subsequent analyses.

Hypothesis 5: Increases in engagement coping and decreases in disengagement coping will predict lower symptom level later in therapy. Hierarchical regression analysis has been used frequently to examine change over time in treatment studies. Hierarchical regression analysis has been shown to demonstrate whether earlier change in one variable predicts later change in a dependent variable (Loeb et al., 2005; DeRubeis et al., 1990). Hierarchical regression analysis, unlike structural equation modeling (SEM), does not create a model of relationships over the course of treatment. Instead, it only tests the specific hypotheses about variable change during specific time points in treatment requested by the researcher. Also, hierarchical regression analysis does not involve the creation of individual growth curves as in hierarchical linear models (HLM). It also requires that the researcher run more tests which increases family-wise error. However, an advantage of using hierarchical regression analysis, a less sophisticated approach to studying relationships between variables over time, is that it does not require as large a sample size as the more complicated data analytic techniques.

Hierarchical regression analyses were used to test a model in which coping at session 8 predicted anxiety symptom level at sessions 8, 12, and posttreatment, controlling for prior symptom and coping change (see Table 2). For example, to assess if

session 8 child-reported coping predicted session 8 symptom level, a regression analysis was conducted in three steps. Session 8 STAIC was the DV in all steps. Intake STAIC was entered in step 1 to control for initial levels of anxiety; intake RSQ-C was entered in step 2 to control for initial levels of coping. In step 3, session 8 RSQ-C was entered as the independent variable.

To assess if session 8 child-reported coping predicted session 12 or posttreatment outcomes, a similar approach was used. The DV was either session 12 or posttreatment STAIC. In step 1, session 8 STAIC was entered to control for midtreatment levels of anxiety. In step 2, session 1 intake RSQ-C was entered to control for initial levels of coping. In step 3, session 8 RSQ-C was entered as the independent variable.

We first looked at parent-reported engagement coping predicting symptom level (Table 2). Parent-reported engagement coping at session 8 did not significantly predict STAIC scores at session 8, 12, or posttreatment. We repeated the analyses for child-reported engagement coping and symptom level. There was a trend toward a positive association between child-reported engagement coping at session 8 and STAIC scores at session 8, B= .25, t= 2.03, p= .067. Child-reported engagement coping at session 8 did not significantly predict STAIC scores at session 12 or posttreatment.

We next looked at parent-reported disengagement coping predicting symptom level (Table 2). There was a trend toward a positive association between parent-reported disengagement coping at session 8 and STAIC scores at session 8, B= 1.49, t= 1.79, p= .099. Parent-reported disengagement coping did not significantly predict STAIC scores at session 12 or posttreatment. We repeated these analyses for child-reported disengagement coping and symptom level. Child-reported disengagement coping at session 8

significantly predicted STAIC scores at session 8, B= 1.28, t= 5.23, p< .001, accounting for 40% of unique variance, $F(1, 11)$= 27.35, such that decreased disengagement was associated with reduced STAIC scores. Child-reported disengagement coping at session 8 did not significantly predict STAIC scores at session 12 or posttreatment.

Hypothesis 6: Early improvement in symptom level will not predict increased engagement coping or decreased disengagement coping later in therapy. Hierarchical regression analyses were used to test a model in which anxiety at session 8 predicted engagement and disengagement coping at sessions 8, 12, and posttreatment, controlling for prior symptom and coping change (see Table 3 and 4). We followed a similar approach to analyses presented in Hypothesis 5.

Parent-reported STAIC at session 8 did not significantly predict engagement coping at session 8, 12, or posttreatment. Child-reported STAIC showed a trend towards a positive association between child-reported STAIC at session 8 and engagement coping at session 8, B= 1.11, t= 2.03, p= .067. Child-reported STAIC scores at session 8 were not found to significantly predict engagement coping at session 12 or posttreatment (see Table 3). Session 8 parent-reported STAIC showed a trend towards a positive association with session 8 disengagement coping, B= .14, t= 1.79, p= .099. Parent-reported STAIC at session 8 did not significantly predict disengagement coping at sessions 12 or posttreatment (see Table 4).

We repeated the analyses for child-reported STAIC scores and disengagement coping. Reduced child-reported STAIC scores at session 8 were found to significantly predict disengagement coping at session 8, B= .56, t= 5.23, p<.001, accounting for 39% of unique variance, $F(1, 11) = 27.35$, $p < .001$. Child-reported STAIC scores at session 8

were not found to significantly predict disengagement coping at session 12 or posttreatment.

Hypothesis 7: Early improvement in the therapeutic alliance will predict improved symptoms later in therapy. A similar approach of hierarchical regression analyses was used to test a model in which alliance at session 8 predicted anxiety at sessions 8, 12, and posttreatment, controlling for prior symptom and alliance change (see Table 5).

Alliance at session 8 did not significantly predict parent-reported STAIC scores at sessions 8, 12, or posttreatment. Alliance at session 8 also did not predict child-reported STAIC scores at session 8, 12, or posttreatment.

Hypothesis 8: Early improvement in symptoms will not predict improvement in the therapeutic alliance later in therapy. A similar approach of hierarchical regression analyses was used to test a model in which anxiety at session 8 predicted alliance at sessions 8, 12, and posttreatment, controlling for prior symptom and alliance change (see Table 6).

We first looked at parent-reported STAIC scores predicting alliance. Parent-reported STAIC scores at session 8 did not predict alliance at sessions 8, 12, or posttreatment. We repeated the analyses for child-reported STAIC scores and alliance. Child-reported STAIC scores at session 8 did not predict alliance at sessions 8, 12, or posttreatment.

Discussion

The current study evaluated if symptoms, coping, and alliance changed significantly over the course of a CBT program for anxious youth and if earlier change in specific and nonspecific process variables (coping and alliance) predicted subsequent

symptom change. Consistent with the results of other manualized CBT trials for children with anxiety disorders, there was significant change in anxiety symptoms, coping, and alliance over the course of treatment (Kendall et al., 1997; Prins & Ollendick, 2003; Shirk & Karver, 2003). As expected, anxiety and disengagement coping decreased over therapy while engagement coping and alliance increased. Although many analyses demonstrated nonsignificant relations between coping change and anxiety, some analyses did produce results consistent with the coping literature that ties reduced internalizing symptoms with improved coping (Compas et al., 2001).

Disengagement coping (by parent and child report) was found to be positively associated with symptom change over the first half of treatment. As disengagement coping decreased over therapy, so did anxiety symptoms. However, disengagement coping was not associated with subsequent symptom change assessed later in treatment at sessions 12 or at posttreatment. There were also some unexpected findings. Child-reported engagement coping was positively associated with anxiety symptoms over the first half of treatment at the trend level. In our sample, as engagement coping increased, anxiety symptoms also increased. This relationship is in the opposite direction as predicted. Conversely, changes in parent-reported engagement coping and the therapeutic alliance over the first half of treatment were not found to be associated with symptom outcomes at any time point.

It was hypothesized that coping would precede symptom change. The evidence here does not support this. However, the contrasting prediction, that symptom change would predict subsequent coping change, also was not supported. Graphic displays of change over treatment revealed that parent-reported engagement coping changed

gradually and appreciably over the first and second half of treatment in an upward direction. Visual inspection of change patterns showed that disengagement coping modestly decreased from pre- to post-treatment. Finally, examination of change over treatment showed that symptoms decreased steadily from pre-treatment to post-treatment

Based on cognitive models of CBT, changes in coping are important before clinical improvement is observed (Kendall, 1994). The fact that coping change did not precede or predict subsequent symptom change fails to support the general coping theory of mediation. At the same time, the alternate hypothesis, that coping would be predicted by symptom change, was also not supported. At this point, there is insufficient evidence to either support or disconfirm the coping theory of mediation. In contrast to theories about the sequence of change, coping and symptoms appeared to have changed in synchrony.

One interpretation is that coping styles are a symptom of anxiety, that as anxiety improves so does a child's approach to problems. In their review of coping and child psychopathology, Compas et al. (2001) found that disengagement coping was associated with more internalizing problems and engagement coping with fewer internalizing problems. Their results may have arisen because coping plays a causal or maintaining role in anxiety, but they also may have come about because coping styles are simply accompanying features of anxiety. Another interpretation of the synchronous change pattern in the current study is that coping and anxiety may be influenced simultaneously by a third variable not assessed in the study. Alternatively, change in coping and anxiety may occur so quickly that it is difficult to detect such rapid bi-directional relationships within a design that assesses coping change once every four sessions.

It is also possible that group means obscured individual change patterns in the current study. Had sequences of change been analyzed for individuals, we may have observed more interpretable sequences of change. Tang and DeRubeis (1999) found that time course data from individual patients showed a different pattern of improvement from group mean time course data. In their study, plots of individual patient data demonstrated that many adult depressive patients experienced sudden and considerable improvements in one between-session interval while plots of group mean data displayed a steady decline in symptoms over treatment. The abrupt changes in symptoms, or "sudden gains," experienced by individual patients were concealed in the group mean plots because they occurred at different time points in therapy across individuals (sessions 2 through 15). Similarly, the use of group means in the current study may have obscured important patterns of change in individual participants.

There also may have been important sequences of change caused by treatment moderators that were not evident by examining the group means. For example, different relationships between coping and symptoms could have emerged between older and younger children with anxiety disorders. Older children may have improved after they changed their coping strategies, and younger children may have changed their coping strategies after they were feeling better.

In fact, an interaction between age and change sequence might be expected. Metacognitive skills and language (e.g., reframing problems, self-talk, problem-solving), which are important to many coping strategies, are not theorized to develop until middle childhood (Moss, Gosselin, Parent, Rousseau, & Dumont, 1997). As a result, younger children may have more difficulty than older children in changing their coping strategies

in response to treatment. Since anxiety may exacerbate this difficulty, younger children may not be able to change their coping strategies until they are feeling better. On the other hand, older children with more advanced cognitive skills may be more able and willing to try to change their coping approach without prior symptom improvement. Additional research examining individual patterns of change and using age as a moderator may produce interesting differences in change curves.

Although coping change did not predict subsequent symptoms in the current study, change in coping and symptoms were correlated over the first half of treatment. Reductions in early disengagement coping were significantly associated with early symptom improvement by child report, and at the trend level by parent report. If these patterns hold with larger sample sizes, it would indicate that disengagement coping could be an important psychological process to monitor during treatment, and may have a lasting relationship with symptom improvement through treatment. As discussed earlier, the reduction of disengagement coping may be important in child anxiety treatment because it may activate the fear network, increasing the probability that new and incompatible information will be processed and anxiety will be reduced. Although these associations do not demonstrate mediation, they are supportive of a coping theory underlying CBT.

Unexpectedly, reductions in engagement coping (by child report) were associated with symptom improvement over the first half of treatment at the trend level. It is not clear what this pattern may be indicating. A visual inspection of change patterns in engagement coping suggests a fairly haphazard pattern of change that does not appear connected with particular phases or content of treatment. The short-lived trend of

decreased engagement coping (according to child report) could suggest that decreased attempts to approach anxiety-provoking situations lead to reduced distress in the short-term. The pattern of change in which child-reported engagement coping did not improve from pretreatment to posttreatment could also indicate that CBT strategies are not effective in increasing engagement coping. This would be unlikely given the emphasis that CBT places on building skills aimed at engagement coping (e.g., cognitive restructuring and problem solving). However, it is possible that children are not mastering the CBT skills that are targeted in the program. This interpretation suggests that engagement coping could have a significant relationship with symptoms if more effective strategies in increasing engagement coping were utilized. An alternate explanation for the absence of an increase in engagement coping (according to child report) is that measurement by self-report may not flawlessly assess for coping change. Behavioral assessments of coping could reveal coping changes that children are not able to observe themselves due to inexperience in self-report and cognitive limitations.

Further research is required to understand these results, but the current study may be indicating that disengagement coping has a more consistent relationship with symptom reduction than engagement coping over the course of treatment. Even though visual inspection of the results indicated that change in disengagement coping occurred more slowly than change in engagement coping, disengagement coping was more consistently related to symptoms. Both parents and children reported a decrease in disengagement coping over treatment while parents reported an increase and children reported an erratic pattern of change in engagement coping. If these patterns hold over time with larger

samples, they could indicate that disengagement coping is more important to long-term symptom improvement than engagement coping.

Supporting evidence of this idea comes from theories that the disengagement strategy, experiential avoidance, may be the important factor in symptom improvement in the treatment of anxiety disorders (Hayes, Wilson, Gifford, Follette, & Strohsal, 1996; Roemer & Orsillo, 2002; Barlow, 1988). Experiential avoidance strategies are attempts to reduce the frequency of certain thoughts, feelings, memories and bodily sensations, and there is evidence for their treatment significance (Hayes et al., 1996). In an anxiety disorder treatment study, Craske, Street, & Barlow (1989) showed that clients with panic disorder who focused on their somatic symptoms (decreasing experiential avoidance) experienced more improvement at six month follow up than panic disorder clients who completed a distraction task (increasing experiential avoidance). It is important to note, however, that dismantling studies showing that reductions in avoidance are responsible for symptom improvement have not been completed. Yet, some researchers theorize that reducing avoidance may be more important than other tactics used in CBT for anxiety, such as cognitive restructuring (Hayes et al., 1996). In fact, engagement strategies such as replacing irrational thoughts with rational thoughts could be considered a form of experiential avoidance because they take attention away from the anxiety (Hayes et al., 1996).

The idea that disengagement coping strategies such as experiential avoidance are more important to symptom reduction than engagement coping may be explained by emotional processing theory (Lang, 1977; Foa & Kozak, 1986). Reductions in disengagement coping may better facilitate emotional processing than increases in

engagement coping. Reducing disengagement strategies may allow a person to confront the anxiety-provoking situation to a greater extent. This interaction with the feared stimulus may result in greater activation of the fear network, which may increase the chances that new and incompatible information about feared stimulus will be processed and that long-term anxiety will be reduced. On the other hand, engagement coping strategies such as cognitive restructuring, distraction, and support seeking may temporarily distract attention away from the feared stimulus, which may not activate the fear network as much. As a result, new and incompatible information may not be as thoroughly processed, and long-term anxiety may not be reduced as much.

Inspection of the patterns of symptom change across treatment showed that symptoms changed gradually throughout therapy. Instead of plunging rapidly during a specific segment of treatment, they reduced steadily over time, indicating that they were improving not as a result of the use of one set of procedures during one portion of therapy, but because of a variety of techniques used over a span of time. Kendall et al. (1997) found that the first half of CBT for child anxiety (which focused on coping education) did not produce meaningful change in symptoms, while the entire treatment together (coping education plus exposure tasks) produced significant improvement. Kendall et al. (1997)'s results indicate that either the second half of CBT is more important to outcome than the first half or that the combined forces of the first and second half of treatment together are vital for a positive outcome. The gradual reduction in symptoms in the present study suggests that the techniques used in the second half of treatment do not accelerate improvement any more than the techniques used in the first half of treatment. This observation could suggest that both treatment segments are

important to recovery. However, dismantling studies would be necessary to determine whether the combined forces of the two segments of treatment or the second half alone are more central to symptom improvement.

The pattern of symptom change that emerged in the current study is at odds with the patterns of change described in the adult CBT treatment literature, in which adult depressed patients have been shown to experience 60-70% of their treatment gains in the first four weeks of treatment (Ilardi & Craighead, 1994). This trend in adult CBT suggests that those procedures used very early in treatment are most responsible for symptom improvement. In contrast, our results indicate that child anxiety symptoms could be impacted by several treatment procedures introduced over the course of CBT (coping education, exposure tasks), and that one technique may not be superior to another.

We found that the therapeutic alliance in child treatment (according to therapist-report) increased significantly over treatment. However, changes in alliance over the first half of treatment did not predict subsequent symptom levels and changes in symptoms over the first half of treatment did not predict subsequent alliance ratings. The fact that alliance change did not predict subsequent symptom change fails to support the alliance theory of mediation. At the same time, the theory that alliance would be predicted by symptom change was also not supported. At this point, there is insufficient evidence to either support or disconfirm the alliance theory of mediation.

The finding that alliance and symptom change were not associated could be explained by the choice of midtreatment as the assessment point for the therapeutic alliance. Since the relationship between alliance and outcome has been shown to be

stronger at specific time periods in treatment, examination of alliance and symptoms over time periods other than those used in the current study may have revealed a significant association (Horvath & Symonds, 1991; Shirk & Karver, 2003). Visual inspection of change over treatment revealed that a wave of alliance improvement occurred between sessions 1 and 5 and between sessions 9 and 11. Accordingly, it is possible that if time points before or after midtreatment had been assessed, an association between alliance and symptoms would have been uncovered. Weersing and Weisz (2002) warned that limited assessments may not fall at optimal time points in treatment. More frequent assessment of mediators through treatment is necessary to increase the possibility that assessments are made at critical moments.

Visual inspection of the graphic display of change over time revealed alliance increased over the course of treatment while anxiety symptoms decreased. The therapeutic alliance changed somewhat in synchrony with symptoms, even though they were not correlated with each other at session 8. Temporal precedence was not apparent by child report, but two possible change patterns were evident by parent report. One change pattern occurred at the start of treatment when symptom improvement between sessions 1 and 2 (by parent report) appeared to precede subsequent enhancement of alliance. The observed relationship between early symptom improvement and alliance does not support the mediation theory of alliance. On the other hand, it is consistent with a theory in which symptom change mediates change in alliance early in treatment.

The second possible change pattern occurred late in treatment when alliance improvement between sessions 9 and 11 appeared to precede subsequent symptom reduction. This observation supports a mediation theory of alliance. However, it is

important to note that both change patterns could be due to natural variation around the mean. Further expansion of the sample is necessary to demonstrate whether these change patterns are reliable.

If these trends do continue over time with larger samples, they are consistent with the results of adult and child treatment research. Symptom improvement early in therapy was found to predict subsequent alliance enhancement in the treatment of adult depressive patients (Barber et al., 2000). In addition, the therapeutic alliance was found to be more strongly associated with outcomes when it was assessed at points later in child treatment (Shirk & Karver, 2003; Chu & Kendall, 2004). If these patterns prove to be reliable over time with larger samples, the data could be indicating that symptoms and alliance build on each other across therapy. Further examination of change patterns between alliance and symptoms at time points early and late in child treatment may be warranted.

The pattern of change observed in alliance (growth over time with waves of improvement and decline) may be related to session difficulty. The first half of the Coping Cat is devoted to education about coping skills and may not be as problematic for anxious children to tolerate. On the other hand, the second half of the Coping Cat is devoted to practicing coping skills during anxiety-provoking in-session exposure tasks and may be more challenging. Alliance improved during the relatively non-threatening portions of therapy (sessions 1-5) and decreased during the more stressful portions of therapy when exposure tasks were about to begin (sessions 6-8) or the most difficult exposure tasks were taking place (sessions 12 to 15). It is important to note that although

alliance decreased at times during treatment, it had a general upward trend and never returned to the base level of the first session.

If alliance fluctuates based on the difficulty of sessions, then it is possible that the most important time to have a good alliance is during the most challenging sessions. A strong alliance may be necessary to achieve collaboration on more demanding tasks and maintain agreement on goals during anxiety-provoking situations. As a result, analyses of alliance and symptoms that assess alliance during the most difficult sessions may uncover a stronger relationship between the two variables.

The current study was limited considerably by the very low sample size. The patterns revealed here may or may not continue as the included participant data is increased. Another clear limitation of the study was the lack of a control group, which prevented formal analyses of mediation or any clear statements about mediation from being made. The study was also limited by the use of group mean time course data, which may have obscured individual patterns of change in treatment. Finally, since coping and alliance were only measured every four sessions in treatment, it is possible that the key assessment points were missed. Future studies should make assessments more frequently to further examine whether these variables precede and predict subsequent symptom change.

However, the study does present a descriptive analysis of trends and patterns of change among several variables of interest in treatment. The patterns revealed were generally consistent with the coping theory of CBT for youth with anxiety disorders, and indicate that coping, specifically disengagement coping, is an important psychological process to monitor and target in treatment. Engagement coping, on the other hand, while

associated with symptom change, may have a more unstable relationship with symptom change. The graphic displays of alliance across treatment illustrate a complex pattern of change, which may be influenced by various factors including symptom change and session difficulty. Although alliance did not predict subsequent symptom change at the assessment points chosen in this study, it may do so at other time points in therapy.

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Table 1

Means and Standard Deviations of Anxiety Symptoms, Coping, and Alliance Across Treatment

	Intake (n=19)	S1 (n=19)	S4 (n=18)	S8 (n=16)	S12 (n=15)	Posttreatment (n=14)
Parent report						
STAIC	54.47 (7.79)	53.12 (6.52)	45.56 (11.38)	46.32 (13.42)	44.54 (11.50)	41.79 (10.76)
RSQ Engagement	33.68 (7.74)	36.06 (7.99)	40.33 (9.19)	41.25 (11.75)	44.86 (10.02)	43.14 (10.33)
RSQ Disengagement	19.11 (5.14)	18.12 (4.77)	18.61 (4.58)	17.50 (3.69)	18.00 (3.57)	17.43 (4.78)
Child report						
STAIC	37.32 (11.52)	34.12 (8.28)	32.28 (8.78)	30.4 (8.72)	27.6 (9.61)	24.58 (5.69)
RSQ Engagement	50.37 (12.73)	49.41 (12.33)	50.78 (11.33)	45.63 (14.88)	47.79 (13.51)	46.08 (16.65)
RSQ Disengagement	19.42 (5.53)	18.53 (6.97)	18.89 (6.59)	16.56 (6.13)	16.50 (6.21)	16.14 (6.25)
Therapist report						
Alliance		50.45 (9.94)	55.25 (9.70)	52.77 (15.02)	53.94 (14.12)	58.82 (11.39)

Note. STAIC= State-Trait Anxiety Inventory for Children, parent and child versions; RSQ= Responses to Stress Questionnaire, parent and child versions; TASC= Therapeutic Alliance Scale for Children, therapist version.

Table 2

Hierarchical Regression Analyses of Session 8, 12, and Posttreatment Anxiety on Session 8 Coping

	S8 STAIC				S12 STAIC				Posttreatment STAIC			
	B	Std. β	t	n	B	Std. β	t	n	B	Std. β	t	n
Parent report												
S8 RSQ Eng	-0.39	-0.34	-1.75	16	-0.11	-0.12	-0.48	15	0.10	0.11	0.45	14
S8 RSQ Dis	1.49*	0.41*	1.79	16	-0.25	-0.08	-0.37	15	-0.33	-0.11	-0.47	14
Child report												
S8 RSQ Eng	0.25*	0.43*	2.03	15	0.13	0.22	0.72	14	-0.06	-0.22	-0.59	13
S8 RSQ Dis	1.28**	0.85**	5.23	15	-0.41	-0.28	-0.47	14	-0.63	-0.88	-1.29	13

Note. STAIC= State-Trait Anxiety Inventory for Children, parent and child versions; RSQ= Responses to Stress Questionnaire, parent and child versions; Eng= Engagement coping; Dis= Disengagement coping; B= raw regression weight; Std. B = standardized regression weight. * = p < .10; ** p < .001.

Table 3

Hierarchical Regression Analyses of Session 8, 12, and Posttreatment Engagement Coping on Session 8 Anxiety

	S8 Engagement				S12 Engagement				Posttreatment Engagement			
	B	Std. β	t	n	B	Std. β	t	n	B	Std. β	t	n
Parent report												
S8 STAIC	-0.52	-0.59	-1.75	16	0.08	0.10	0.35	14	0.16	0.21	0.85	14
Child report												
S8 STAIC	1.11*	0.64*	2.03	15	-0.02	-0.02	-0.04	13	1.17	0.67	1.31	11

Note. STAIC= State-Trait Anxiety Inventory for Children, parent and child versions; RSQ= Responses to Stress Questionnaire, parent and child versions; B= raw regression weight; Std. B = standardized regression weight. * = p < .10; ** p < .001.

Table 4
Hierarchical Regression Analyses of Session 8, 12, and Posttreatment Disengagement Coping on Session 8 Anxiety

	S8 Disengagement				S12 Disengagement				Posttreatment Disengagement			
	B	Std. β	t	n	B	Std. β	t	n	B	Std. β	t	n
Parent report												
S8 STAIC	0.14*	0.51*	1.79	16	0.05	0.18	0.43	14	0.14	0.39	1.11	14
Child report												
S8 STAIC	0.56**	0.84**	5.23	15	0.18	0.28	0.38	13	0.76	1.14	1.64	13

Note. STAIC= State-Trait Anxiety Inventory for Children, parent and child versions; RSQ= Responses to Stress Questionnaire, parent and child versions; B= raw regression weight; Std. B = standardized regression weight. * = p < .10; ** p < .001.

Table 5

Hierarchical Regression Analyses of Session 8, 12, and Posttreatment Anxiety on Session 8 Alliance

	S8 Parent STAIC				S12 Parent STAIC				Posttreatment Parent STAIC			
	B	Std. β	t	n	B	Std. β	t	n	B	Std. β	t	n
S8 TASC	-0.32	-0.41	-1.40	12	0.20	0.28	0.80	12	0.19	0.33	0.92	11

	S8 Child STAIC				S12 Child STAIC				Posttreatment Child STAIC			
	B	Std. β	t	n	B	Std. β	t	n	B	Std. β	t	n
S8 TASC	-0.19	-0.37	-1.36	12	0.20	0.33	1.11	12	0.02	0.07	0.24	11

Note. STAIC= State-Trait Anxiety Inventory for Children, parent and child versions; TASC= Therapeutic Alliance Scale for Children; therapist version; B= raw regression weight; Std. B = standardized regression weight. * = $p < .10$; ** $p < .001$.

Table 6
Hierarchical Regression Analyses of Session 8, 12, and Posttreatment Alliance on Session 8 STAIC

	S8 TASC				S12 TASC				Posttreatment TASC			
	B	Std. β	t	n	B	Std. β	t	n	B	Std. β	t	n
Parent report												
S8 STAIC	-0.62	-0.48	-1.40	12	-0.35	-0.30	-0.91	9	-0.26	-0.28	-1.05	11
Child report												
S8 STAIC	-0.99	-0.51	-1.36	12	-0.80	-0.43	-1.31	9	-0.29	-0.22	-0.62	11

Note. STAIC= State-Trait Anxiety Inventory for Children, parent and child versions; TASC= Therapeutic Alliance Scale for Children; therapist version; B= raw regression weight; Std. B = standardized regression weight. * = $p < .10$; ** $p < .001$.
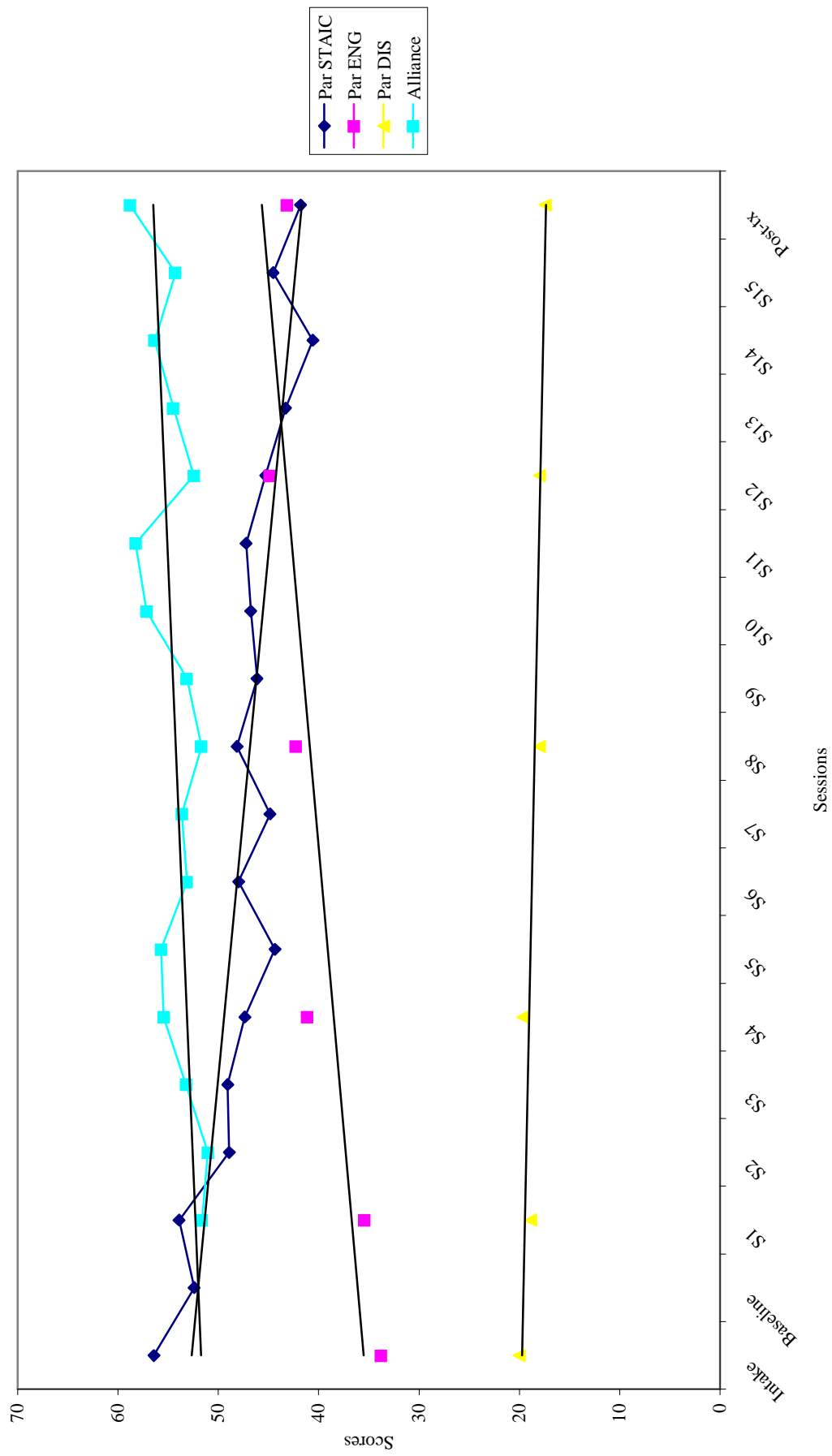
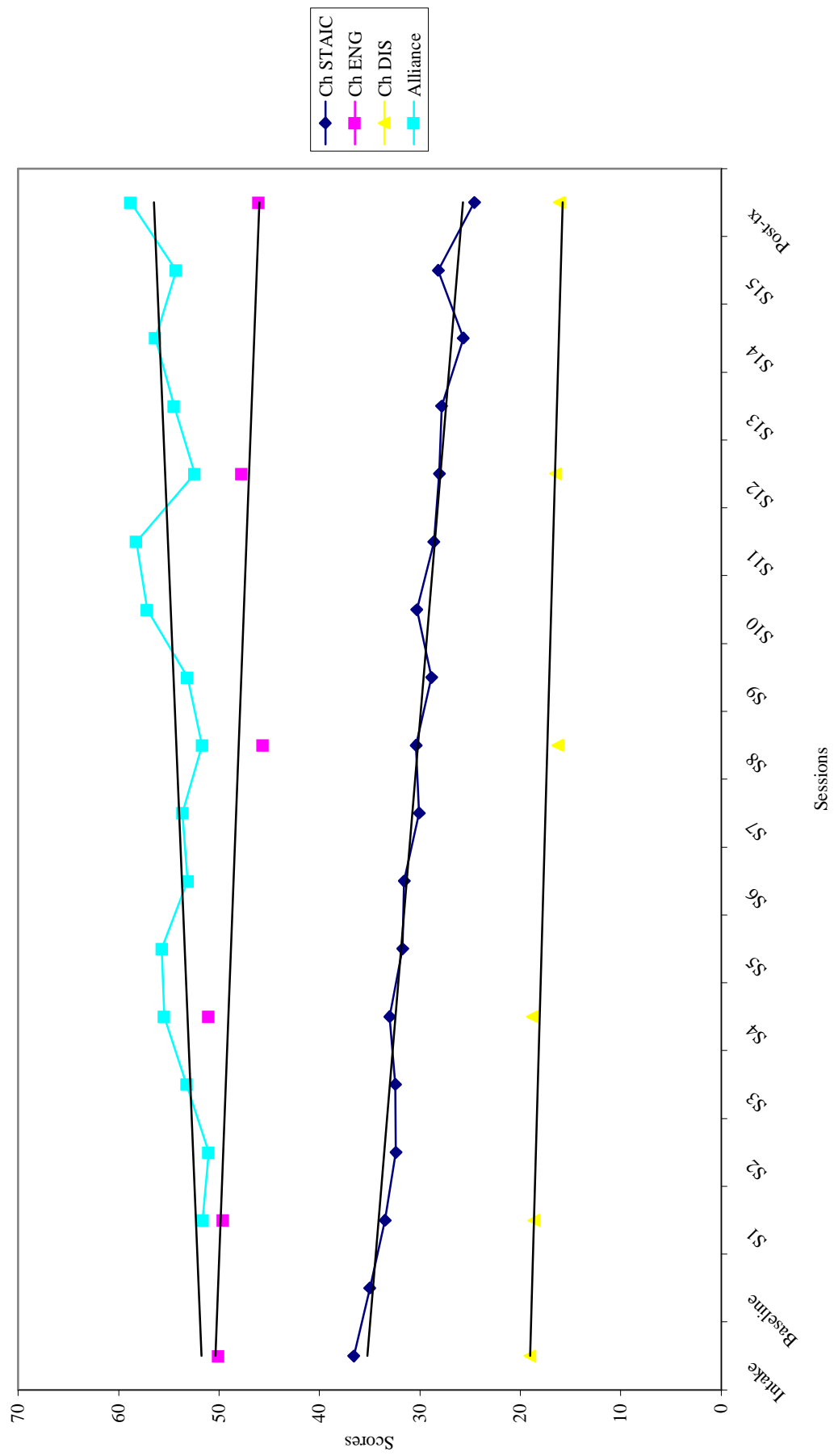Figure 1. Parent report of child anxiety, coping, and alliance across treatment (n=14).

Figure 2. Child report of measures of anxiety, coping, and alliance across treatment (n=14)