The Role of Self-Statements as a Mediator in Treatment for Youth With Anxiety Disorders

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The Role of Self-Statements as a Mediator in Treatment for Youth With Anxiety Disorders

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The authors investigated features of self-statements as predictors of anxiety in children with and without anxiety disorder (AD) and as a mediator of treatment of ADs in children. Children ($N = 145$) between the ages of 9 and 13 years participated (71 AD youth, 84 controls). Self-statements were classified by valence and content. Results indicated that children's anxious, but not positive or depressed, self-statements significantly predicted anxiety in children with and without AD. For children with AD, changes in anxious self-statements mediated treatment gains, replicating a previously reported finding. A states of mind ratio mediated only 1 outcome measure, and positive and depressive cognitions served no mediating role. The impact of anxious self-talk on children's adjustment and implications for cognitive theory of anxiety in children are discussed.

Keywords: child, anxiety, treatment, mediators, cognitive change

Potential change mechanisms in child psychotherapy can be suggested by cognitive−behavioral models that highlight the importance of cognitive content, processes, and structures as critical in the maintenance and amelioration of anxiety disorders (ADs) in youth (e.g., Beck, Emery, & Greenberg, 1985; Kendall, 2006; Kendall & Ingram, 1989). The important dimensions of self-statements in child anxiety focus on negatively valenced self-talk (i.e., the power of nonnegative thinking, Kendall, 1984; Kendall & Korgeski, 1979), the content of the internal dialogue (i.e., content-specificity hypothesis; Beck, Brown, Steer, Eidelson, & Riskind, 1987), and a ratio of the relative balance between negative and positive self-statements (i.e., states of mind model (SOM), Schwartz & Garamoni, 1986). Examining self-talk and its impact on the cognitive system can elucidate etiology and treatment mechanisms of anxiety disorders in children, as well as inform cognitive theory in general.

Cognitive theories and therapies have accrued supportive evidence and have been applied to a range of disorders, constituting a major model of psychopathology and its treatment (e.g., Barlow, 1988; Beck et al., 1985). Advances in our understanding of cognitive theory in child anxiety has developed at a slower pace than in adult anxiety, with downward extensions of the adult models shaping the empirical work with children (Alfano, Beidel, & Turner, 2002; Daleiden & Vasey, 1997). To organize the burgeoning literature examining cognitive correlates of anxiety, Kendall and Ingram (1989) proposed a taxonomic scheme including cog-

nitive structures, propositions, operations, and products. *Cognitive structures* refer broadly to the architecture of the system, encompassing the storage and organization of information. *Propositions* refer to the content of information that is stored within structures. *Operations* are the processes by which the system works, and *products*, such as self-statements, can be the end result of the operation of the cognitive system. As the cognitive system engages the social environment, the interface can reflect psychological problems in either (a) cognitive distortions or (b) cognitive deficiencies (Kendall, 2006). *Distorted processing* encompasses dysfunctional operations and products and includes excessive negative self-talk. *Deficiencies in processing* refer to a lack of cognitive activity when required by situations.

Cognitive theories posit that child anxiety results in part from chronic overactivity of schemas organized around the propositions of danger, harm to self, and personal vulnerability or inability to cope (Beck et al., 1985; Kendall, 1985). These schemas disproportionately focus processing resources upon threat-relevant information (Daleiden & Vasey, 1997). Distorted cognitive operations are primed to encode and retrieve anxious information, yielding maladaptive products such as negative self-statements (Kendall & Ingram, 1989).

Research in child anxiety has focused on the cognitive operation of hypervigilence for threat cues in the environment, and the valence and specificity of cognitive products, or self-statements. For instance, it is fairly well established that anxious children selectively attend to threatening information (e.g., Muris, Rapee, Meesters, Schouten, & Geers, 2003; Suarez & Bell-Dolan, 2001; Vasey, Daleiden, Williams, & Brown, 1995; Vasey, El-Hag, & Daleiden, 1996).

The valence (positive, negative) and content of self-statements has been a second area receiving attention. The association between negative self-statements and elevated levels of anxiety has emerged as a consistent finding across samples and developmental levels, and using various assessment methods. For example, cross-sectional research found the association in community samples

using think aloud methods (Fox, Houston, & Pittner, 1983), thought listing (Prins, 1986; Prins & Hanewald, 1997; Szabo & Loviband, 2004), and questionnaires (Brophy & Erickson, 1990; Muris, Merckelbach, Mayer, & Snieder, 1998; Ronan & Kendall, 1997; Ronan, Kendall, & Rowe, 1994; Zatz & Chassin, 1985), as well as in AD samples using thought listing (Bogels & Zigterman, 2000; Kendall & Chansky, 1991) and endorsement methods (Schniering & Rapee, 2002, 2004; Treadwell & Kendall, 1996).

Studies have examined the content specificity of negative self-statements associated with anxiety, thought to be focused on future-oriented questioning that centers on danger, harm, and threat. For youth depression, where the content is said to be focused on loss and personal failure, the content specificity hypothesis has received support (e.g., Ambrose & Rholes, 1993; Laurent & Stark, 1993; Schniering & Rapee, 2002, 2004), but the content specificity findings for anxiety are less clear. Nevertheless, using the thought listing method, anxious children's self-statements generally reflected themes of preoccupation (Fox et al., 1983), anticipation of future negative outcome (Szabo & Loviband, 2004), and negative self-evaluation (Prins & Hanewald, 1997).

More stringent tests of content specificity examining the differential association of anxious and depressed self-statements with anxiety have reported mixed results. Elevated anxiety in normal (Marien & Bell, 2004) and clinical (Schniering & Rapee, 2004) samples was specifically predicted by anxious, but not depressed, self-statements. In contrast, children without AD who reported elevated anxiety also reported significantly greater frequencies of anxious and depressive self-statements compared with less-anxious children (Muris et al., 1998; Ronan & Kendall, 1997). Anxious self-statements differentiated children with AD from controls but not from children diagnosed with depression (Laurent & Stark, 1993), and anxious self-statements predicted both anxiety and depression symptoms in a combined group of community and AD children (Treadwell & Kendall, 1996). The extent to which anxious self-statements are specific to anxiety and not reflective of an underlying negative affectivity requires additional research. These studies used varying methods of measurement, which suggests that method variance may be an influence in the degree of support for content specificity.

Relative to negative self-statements, the role of positive self-statements in child anxiety is less clear. Anxiety in children without AD was associated with fewer positive self-statements (Marien & Bell, 2004; Ronan & Kendall, 1997; Zatz & Chassin, 1985), yet others have not found a significant relationship between positive self-talk and anxiety in children without AD (Brophy & Erickson, 1990; Houston, Fox, & Forbes, 1984; Prins, 1986) or children with AD (Bogels & Zigterman, 2000; Kendall & Chansky, 1991; Treadwell & Kendall, 1996).

Rather than viewing valence and content specificity separately, the SOM model proposes that a relative balance of negative and positive cognition is critical (see Schwartz, 1997; Schwartz & Garamoni, 1986). This model hypothesizes that information processing strikes a relative balance (at a set point) to optimize the salience of important information for the cognitive system. Adaptive functioning occurs when a larger pool of positive resources are present to direct stable functioning, whereas negative information is maximally salient to direct coping to stressors. The balance point was hypothesized to be a ratio of approximately 62% positive versus 38% negative information. Thus, optimal psychological functioning is represented when positive and negative information reflect this balance or state of mind. Deviations from this balance distort processing and contribute to varying degrees of psychological dysfunction. The SOM model applied to self-statements is a ratio computed by dividing positive self-statements by the sum of positive plus negative self-statements ($P/P+N$).

Seven categories describe the SOM ratios that reflect hypothesized adaptive/maladaptive functioning (Schwartz, 1997). According to theory, optimal functioning is a .67−.90 ratio of positive to negative cognition (a positive dialogue), in which a relative majority of positive self-talk buffers and/or outweighs the negative. A dialogue balanced at .62 is associated with adaptive coping under stressful conditions (the successful coping dialogue category). Further shifts in the ratio are said to be associated functionally to psychopathology. When the balance approximates equal positive and negative self-statements (i.e., a .50 ratio; the conflicted dialogue) there is a state of uncertainty and vacillation, such as mild to moderate anxiety. Greater deviations wherein negative information predominates (i.e., an SOM ratio of .38; the negative dialogue) would result in more moderate and stable forms of psychopathology (AD). A preponderance of negative information (SOM < .31) was labeled the *negative monologue* and is hypothesized to be associated with severe psychological disorders. On the other side, a ratio of .69 or higher, called the *positive monologue*, is linked with grandiosity and related conditions.

The SOM model has received preliminary support in child samples. Increasingly dysfunctional SOM ratios have been associated with greater levels of anxiety and depression in youth (e.g., Calvete & Cardenoso, 2002; Ronan & Kendall, 1997; Treadwell & Kendall, 1996). For example, Calvete and Cardenoso (2002) reported that youth with low internalizing distress averaged SOM ratios in the positive dialogue category, those with moderate distress reported ratios in the successful coping dialogue category, and those with high internalizing distress reported ratios in the conflicted dialogue category. However, the theoretical setpoints for the ratios within the SOM model supported in the adult literature (e.g., Heimberg, Dodge, et al., 1990; Marchione, Michelson, Greenwald, & Dancu, 1987) were not fully supported when applied to youth with AD (Treadwell & Kendall, 1996).

Although evidence is accumulating in support of the hypothesized cognitive propositional and operational biases said to exist in anxious youth, particularly for the role of negative self-statements, there is a marked need for studies that directly investigate cognitive change processes. A cornerstone in cognitive theory posits that cognitive change mediates emotional and behavioral responses and that such change is enmeshed in treatment outcomes (e.g., Beck, 1976). In therapy, change can focus on identifying and evaluating faulty information processing and underlying dysfunctional schemata to shift from maladaptive automatic processing to a more adaptive and controlled processing (Clark & Beck, 1989; Ingram & Hollon, 1986).

Despite cognitive−behavioral therapy (CBT) being identified as probably efficacious (see Albano & Kendall, 2002; Kazdin & Weisz, 1998; Ollendick, King, & Chorpita, 2006), the mechanisms of change in childhood anxiety are not well understood. Additional progress requires identifying why and how treatments work by examining mediating, or change, variables. Indeed, the identification of process variables within efficacious treatments has been

highlighted as a critical need (Kazdin & Kendall, 1998; Kraemer, Wilson, Fairburn, & Agras, 2002; Weisz & Jensen, 2001) and the best investment for improving clinical practice with children (Kazdin & Nock, 2003). Though highlighted as a need, examining mediators has only recently been a focus of research. In a review of child and adolescent studies of empirically supported treatments, 63% considered a potential mediator, but only 9% (six of the studies) actually conducted a formal test for statistical mediation (Weersing & Weisz, 2002). For example, some initial support for cognitive change in the treatment of youth was provided by Kaufman, Rohde, Seeley, Clarke, and Stice (2005), who reported that treatment outcomes for depressed adolescents were mediated by changes in depressed self-statements—a finding that provides preliminary support for changes in cognitive self-talk as preceding depressive symptom change (see also Beevers & Miller, 2005).

It seems reasonable to conclude that although there are studies of cognitive processes in child anxiety, a dearth of information exists as to the degree to which these processes are responsible for change over the course of treatment. In an initial examination of cognitive change mechanisms in the treatment of AD youth, Treadwell and Kendall (1996) reported that anxious self-statements were partial mediators of treatment gains. The self-statements of children with AD receiving treatment indicated that anxious self-statements partially mediated change in anxiety severity on four child anxiety/fear measures. Positive and depressed self-statements did not mediate changes. However, change in anxious self-statements also predicted change scores in depression after treatment, somewhat mitigating the support for content specificity. An SOM ratio calculated from anxious self-statements also mediated gains in treatment, although the specific setpoints for AD youth were not supported. These evaluations suggest that treatment may be partially mediated through changes in children's anxious self-talk and provide preliminary support for the hypothesized role of negative self-statements. However, this study examined the role of content specificity and valence separately and provided mixed findings regarding content specificity as well as the SOM model. The extent to which these results support the role of anxious self-statements in therapeutic change can be replicated, and a more direct test of negative affect, specificity, and the SOM model, have yet to be examined.

Given the need for empirical evaluation of the role of cognitive products and operations in child anxiety, and the need to study change processes through mediator analyses, the present study examined the association between cognitive variables (e.g., anxious self-talk) and (a) anxious symptomatology in children with and without AD and (b) their mediating role in treatment outcome for youth diagnosed with an AD. The present study first examined the hypothesis that anxious self-statements and the SOM ratio, but not positive or depressed self-statements, would be significantly associated with anxious symptoms in children with and without AD. Second, it was hypothesized that changes in anxious cognition would predict changes in child functioning following treatment (CBT) and that these self-statements would partially mediate treatment outcome. These hypotheses were examined using content-specific negative self-statements as well as an SOM ratio to examine the theories of nonnegative thinking, content specificity, and the SOM model. It was predicted that content specificity of negative self-statements would account for a greater proportion of emotional and behavioral change, rather than negative self-statements reflecting general negative affectivity or the overall balance of negative to positive self-statements as indicated in the SOM model.

Method

Participants

Children ($N = 145$) ages 9–13 ($M = 11$ yrs; 47% girls) served as participants. Seventy percent were Caucasian, 21% were African American, 5% were Hispanic, and 4%, other. The median family income was $40,000–49,000, ranging from $10,000 to more than $80,000. Consecutive referrals to a university-based outpatient AD center receiving a principal AD diagnosis served as the AD group ($n = 71$). These children were a subsample of participants in a separate randomized clinical trial examining a manualized CBT for ADs. None of the participants in this study overlapped with those in the Treadwell and Kendall (1996) or the Ronan and Kendall (1997) reports. Principal diagnoses for the AD participants in this study were generalized anxiety disorder/overactive adrenaline disorder (64%), seasonal affective disorder (17%), or social phobia/avoidant disorder (19%), according to *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*; American Psychiatric Association, 1994). Of these children with AD, 55% were comorbid with a second of these three disorders, 52% with a specific phobia, 14% with attention-deficit/hyperactivity disorder, and 7% with oppositional defiant disorder.[1] Children ($n = 84$) serving as non-AD comparisons were recruited from the community. These children scored within normal limits on multiple measures (see *Measures*) of anxiety, fear, depression, and externalizing behavior.

Measures

Child self-reports. Children reported symptoms of anxiety, fear, and depression. Anxiety measures included the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978), a 37-item instrument in which a child reports "yes" or "no" as to whether a descriptive item describes him or her. A total score is converted to a *T* score, with higher scores reflecting greater chronic anxiety. The RCMAS contains four subscales: Physiological Anxiety, Worry/Oversensitivity, Social Concerns/Concentration, and Lie. The total score was used in this study. Reliability, validity, and normative data are acceptable (Reynolds & Paget, 1983). The enduring tendency to experience anxiety (A-Trait) and transient anxiety (A-State) were measured with the State–Trait Anxiety Inventory for Children (Spielberger, 1973). Each scale contains 20 items rated on a 3-point Likert scale for how frequently the behavior occurs, and scores range from 20 to 60. Internal consistency was demonstrated (coefficient alphas ranged from .78 to .89) as well as good test–retest reliability (*r*s range from .65 to .71). Validity and factor analysis supporting the state–trait distinction has been reported (Spielberger, 1973). The Fear Survey Schedule for Children–Revised (FSSC-R; Ollendick, 1978) is an 80-item instrument that assesses specific fears on a 3-point scale across eight content categories in children. The FSSC-R demonstrates acceptable internal consistency and retest reliability (Neal, Lilly, & Zakis, 1993; Ollendick, King, & Frary, 1989). Finally, children completed the Children's Depression Inventory (CDI; Kovacs, 1981), a 27-item instrument assessing a range of depressive symptoms, including disturbed mood, vegetative functions, and self-evaluation. Total scores range from 0 to 54, with higher scores indicating greater depression. Acceptable internal consistency (coefficient alphas range from .83 to .90), retest reliability (*r*s range from .66 to .82), and normative data are available (Finch, Saylor, & Edwards, 1985; Saylor, Finch, Spirito, & Bennett, 1984).

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[1] Ten children who were comorbid for major depression disorder/dysthymia were not included in these analyses.

The Negative Affectivity Self-Statement Questionnaire (NASSQ) assesses anxious and depressed self-statements in youth (Ronan et al., 1994), and was developed in an empirical manner to maximize validity (see Glass & Arnkoff, 1994). Children rated the 70 items on a 5-point Likert scale reflecting how frequently each thought came into their mind over the past week. Anxious self-statements (e.g., "I am very nervous") and positive self-statements (e.g., "I am a winner") were those self-statements previously found to have reliably differentiated anxious from nonanxious youth (Ronan & Kendall, 1997; Ronan et al., 1994). The depressed self-statements (e.g., "I am not happy at all") are those self-statements that reliably separated depressed from nondepressed youth (Ronan et al., 1994). A total scale score (sum of all items) and separate anxiety and depression subscales are computed and converted to a uniform metric. Acceptable alpha reliability (rs range from .89 to .96), retest reliability (rs range from .73 to .96), and concurrent validity were reported (see also Sood & Kendall, in press). The NASSQ differentiated anxious and depressed children from control children and is sensitive to CBT (Kendall, 1994; Ronan et al., 1994; Treadwell & Kendall, 1996).

Parent report. Parents reported their child's internalizing and externalizing distress on the Child Behavior Checklist (CBCL; Internalizing and Externalizing, respectively), a 118-item scale measuring an array of behavior problems including total problems and broadband internalizing and externalizing symptoms (Achenbach, 1991a). Retest reliability, content validity, construct validity, and national normative data are available.

Teacher report. Teachers reported their observations of children's internalizing and externalizing problems on the Teacher Report Form (TRF; Internalizing and Externalizing, respectively), similar to the CBCL (Achenbach, 1991b). Raw scores are converted to standardized scores on the basis of normative data. Adequate retest reliability, content validity, and construct validity were reported.

Diagnoses. The Anxiety Disorders Interview Schedule for Children is a structured diagnostic interview to diagnose anxiety disorders in youth and to screen for other *DSM* diagnoses (Silverman, 1987; Silverman & Nelles, 1988; see also Silverman & Albano, 1996). Reliabilities (Kappa; Cohen, 1977) for the diagnosticians were 80%. Diagnosticians were considered trained and eligible for participation when three consecutive interviews were in 80% agreement with the head diagnostician.

Procedure

After informed consent, children and parent(s) in the AD group were interviewed separately and completed measures. Teacher reports were returned in a self-addressed stamped envelope. Children diagnosed with an AD participated in a randomized controlled trial (for details, see Kendall et al., 1997), and were randomly assigned to either a waitlist or treatment condition. An independent evaluator who was unaware of participants' treatment status reassessed all children at posttreatment. The main results of the randomized controlled trial indicated that the treatment successfully decreased anxiety and internalizing distress across multiple informants (i.e., child, parent, teacher, and independent evaluator). This study examined the processes by which outcome was achieved; the extent to which self-statements mediated treatment gains.

Non-AD participants were recruited from psychology courses by a project announcement. These children helped a university student earn research credit and were paid $10. After informed consent, children and their parent(s) completed the measures of child functioning, and teachers submitted their report in a manner similar to that of the clinic children. For a child to qualify as a non-AD control participant, multiple psychometric criteria were used: scores on all measures had to be within one standard deviation of the national normative mean for that instrument.

Results

The first set of analyses examined the role of self-statements in the functioning of AD and non-AD youth: (a) anxious, depressed,

and positive self-statements and (b) the SOM model. The second set of analyses examined whether these cognitive variables functioned as mediators of treatment outcome for the children with AD.

Group Comparability

Analyses of variance revealed that normal participants did not differ from AD children in terms of age. Chi-square analyses revealed that gender and family income were comparable across groups; the groups differed in ethnic composition, $\chi^2(1, N = 144) = 21.8$, $p < .05$, with more African Americans in the community controls than the clinical sample.[2]

Children with AD scored significantly higher (i.e., more distressed) on measures of self-, parent- and teacher-reports of functioning. These results were consistent for the RCMAS, $F(1, 143) = 14.5$, $p < .001$; A-Trait, $F(1, 144) = 5.7$, $p < .05$; A-State $F(1, 142) = 18.3$, $p < .001$; CDI, $F(1, 143) = 6.3$, $p < .05$; CBCL Internalizing scale, $F(1, 111) = 88.3$, $p < .001$; the TRF Internalizing, $F(1, 88) = 42.5$, $p < .001$, and TRF Externalizing scale, $F(1, 88) = 5.5$, $p < .05$. Children with AD and children without AD did not score significantly different on the FSSC-R or CBCL Externalizing scale ($p > .05$).

Self-Statements in AD and Non-AD Youth

Anxious, depressed, and positive cognition. Means and standard deviations for self-statements are presented in Table 1. Children with AD endorsed significantly greater frequencies of anxious self-statements ($t = 3.0$, $p < .005$), but not depressed or positive self-statements, compared with children without AD. Next, the relationship between self-statement frequencies and child adjustment was evaluated for AD and comparison youth. Anxiety, fear, depression, internalizing, and externalizing behavior measured by child, parent, and teacher reports served as the dependent variables. We performed hierarchical multiple regressions, with anxious, depressed, and positive self-statements entered in the first step, and the SOM anxiety (SOM-A) and SOM depressed (SOM-D) ratios entered in the second step. In general, anxious self-statements, but not depressed or positive self-statements, predicted anxiety severity and fear as reported by children (see Table 2). Anxious self-statements predicted the RCMAS, A-State, A-Trait, and FSSC-R ($ps < .05$). Depression and parent- and teacher-report measures of broader internalizing and externalizing child functioning were not predicted by children's anxious self-statements. Depressed self-statements specifically predicted child depression as measured by the CDI ($p < .001$).

SOM model. An SOM ratio was computed as positive self-statements divided by positive plus negative self-statements by using equal numbers of negative and positive self-statements from

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[2] Given the significant difference between the non-AD and AD groups for ethnicity, we conducted separate analyses to ensure that results were not influenced by this variable. Analyses of variance comparing ethnicity and self-statements (anxious, depressed, and positive self-statements, and SOM and SOM-D ratios) indicated that ethnicity did not impact self-talk (all ps > .05; results available from Kimberli R. H. Treadwell). These findings are consistent with results indicating that ethnicity did not influence anxiety severity in children with and without AD, nor did it influence treatment outcome for children with AD (Treadwell, Flannery, & Kendall, 1995).

Table 1

Means (and Standard Deviations) of Self-Statements for Children With and Without Anxiety Disorders

| | Self-statements | | | | | | | | | |
| | Anxious | | Depressed | | Positive | | SOM-A ratio | | SOM-D ratio | |
Group	M	SD	M	SD	M	SD	M	SD	M	SD
Control	22	7.09	21	6.99	37	4.22	.63	.07	.64	.08
Anxiety disorder	27	10.91	24	11.13	37	4.03	.59	.08	.62	.09
Pretreatment										
Treatment group	25	9.75	22	9.65	37	4.58	.60	.07	.64	.08
Waitlist group	29	12.24	27	12.75	37	3.08	.57	.10	.60	.10
Posttreatment										
Treatment group	19	8.19	17	6.44	37	2.91	.67	.08	.69	.07
Waitlist group	24	10.33	22	10.43	36	2.98	.61	.09	.62	.10

Note. SOM-A = states-of-mind ratio calculated with anxious self-statements; SOM-D = states-of-mind ratio calculated with depressed self-statements.

the NASSQ (13 in the present study), as recommended in the literature (Kendall & Chansky, 1991). Two SOM ratios were computed to reflect a ratio based on negative anxious self-statements (SOM-A) and negative depressed self-statements (SOM-D). An arcsine transformation of the SOM ratios was used to normalize the distribution.

Children with AD endorsed significantly lower SOM-A ratios ($t = -2.9$, $p < .005$), but not SOM-D, than did non-AD participants (see Table 1). When the SOM-A ratios for each group were compared with the theoretical setpoints the results indicated that all children fell within the same category. Non-AD children's SOM-A ratio averaged .63, with a confidence interval of .62 to .65. This SOM falls within the "successful coping dialogue" (adaptive coping under distress). The SOM-A for children with AD averaged .59 (confidence interval = .57–.61), also falling within the suc-

cessful coping dialogue, and overlapping with the conflicted dialogue. The SOM-A ratio of treated children significantly differed from that of waitlist children, $F(1, 59) = 6.6$, $p < .05$. Treated children's SOM-A ratio at posttreatment averaged .67 (confidence interval = .65–.70). This confidence interval overlaps the successful coping dialogue and healthier positive dialogue categories and was better than that of control and waitlist children's SOM category.

The SOM-D ratio did not differ significantly between AD and non-AD children ($p > .05$). The average SOM-D for control children was .64 (confidence interval = .63–.66) and fell between the successful coping and positive dialogue categories. Children with AD reported an SOM-D averaging .62 (confidence interval = .60–.64) and falling within the successful coping category. Children receiving treatment reported an SOM-D ratio of .69 after

Table 2

Summary of Hierarchical Regression Analyses for Self-Statements Predicting Functioning for Youth With and Without Anxiety Disorders

| | Dependent variables | | | | | | | | | |
| | RCMAS | | A-State | | A-Trait | | FSSC-R | | CDI | |
Analysis	ΔR^2	Final β	ΔR^2	Final β	ΔR^2	Final β	ΔR^2	Final β	ΔR^2	Final β
Step 1	.35**		.17**		.39**		.27**		.44**	
Anxious		.57**		.38*		.55**		.54**		.13
Depressed		−.01		.03		.10		−.01		.55**
Positive		.07		.00		−.01		−.07		−.00
Step 2	.00		.02		.01		.00		.02*	
SOM-A		.24		−.78		−.27		.21		−.88*
SOM-D		−.37		.94*		−.25		−.32		.88*
Total R^2	.35**		.19**		.40**		.28**		.46**	

Note. Given the number of regression analyses, only significant results are summarized here. RCMAS = Revised Children's Manifest Anxiety Scale; A-State = State–Trait Anxiety Scale for Children, State scale; A-Trait = State–Trait Anxiety Scale for Children, Trait scale; FSSC-R = Fear Survey Schedule for Children–Revised; CDI = Children's Depression Inventory; Anxious = anxious self-statements; Depressed = depressed self-statements; Positive = positive self-statements; SOM-A = states-of-mind ratio calculated with anxious self-statements; SOM-D = states-of-mind ratio calculated with depressed self-statements.
* $p < .05$. ** $p < .001$.

treatment (confidence interval = .67–.71), falling into the positive dialogue category. The SOM-D increased significantly from pretreatment to posttreatment, $F(1, 36) = 23.1, p < .001$.

The extent that SOM ratios predicted concurrent functioning was examined in hierarchical multiple regression equations as described earlier. The SOM-A did not predict child-reported anxiety or fear but did predict depression ($p < .05$; see Table 2). The SOM-D predicted state anxiety and depression as rated by the child ($ps < .05$).

Self-statement change as It predicts functioning following CBT. The relationship between self-statement change and changes in child functioning following CBT was examined with hierarchical multiple regression analyses for the AD youth participating in the larger randomized controlled trial (main results reported in Kendall et al., 1997). Change scores were calculated for self-statements and outcome variables (child-, parent-, clinician-, and teacher-report of child functioning) as the difference between pretreatment and posttreatment scores. Change scores for anxious, depressed, and positive self-statements were entered in the first step, and change scores for the SOM-A and SOM-D were entered in the second step. The dependent variables were the change scores for child-reported chronic anxiety, state anxiety, trait anxiety, fear and depression, parent- and teacher-reported internalizing and externalizing distress, and clinician diagnosis. Results indicated that anxious self-statements significantly predicted changes in anxiety, fear, and depression in child outcome measures for the RCMAS, A-Trait, FSSC-R, and CDI (all $p < .05$; see Table 3). Depressed self-statements did not predict changes in child functioning, while positive self-statements predicted only the RCMAS and diagnosis.

Next, the SOM model was examined as it related to changes in child functioning after CBT. Overall, changes in the SOM-A did not predict any dependent variable change scores (see Table 3) whereas the changes in the SOM-D ratio approached significance for one child self-report index of anxiety severity, the RCMAS.

Mediation of CBT Outcome for AD Youth

Anxious, depressed, and positive self-statements. The potential mediating role of self-statements in treatment outcome followed Baron and Kenny (1986) and the implications of this model for randomized controlled trials (Holmbeck, 2002; Kraemer et al., 2002). Treatment status served as the independent variable, self-statement change scores served as the potential mediating variables and treatment outcome, as measured by change scores for child functioning measures (e.g., change from pretreatment to posttreatment), served as the dependent variables. For AD children, treatment condition predicted the dependent measures of change in child functioning (Path C1) and the mediating variable of anxious self-statement change (Path A). Anxious self-statement change predicted changes in the dependent measures of child functioning (Path B). When anxious self-statements were entered with treatment condition, the independent variable no longer significantly predicted the dependent variables (Path C2), supporting the mediating role of self-statements (see Table 4). Following this logical model, results are consistent with a partial mediating role of anxious self-statements for treatment outcome for child-reported anxiety, fear, and depression. To provide a more direct test of the mediating role of anxious self-statements, a Sobel test (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) was performed, and the results indicated that anxious self-statements were significant mediators for the RCMAS ($z = 2.0, p < .05$), A-Trait ($z = -2.1, p < .05$), and the CDI ($z = -2.1, p < .05$). The mediating role of anxious self-statements for fear approached significance on the FSSC-R ($z = -1.8, p = .065$). Depressed and positive self-statements were not predicted by treatment status (Path A), and hence mediation was not supported.

SOM model. The potential mediating role of the SOM ratios in treatment outcome was examined in the same fashion. SOM change scores were computed as the difference between post- and pretreatment and tested in regression equations for the three paths

Table 3

Summary of Hierarchical Regression Analyses for Self-Statement Change Predicting Change in Functioning Following Treatment of Youth With and Without Anxiety Disorders

Analysis	RCMAS		A-Trait		FSSC-R		CDI		Diagnosis	
	ΔR^2	Final β	ΔR^2	Final β	ΔR^2	Final β	ΔR^2	Final β	ΔR^2	Final β
Step 1	$.17^{**}$		$.31^{**}$		$.18^*$		$.23^*$		$.14^*$	
Anxious		$.44^*$		$.43^*$		$.42^*$		$.35^*$		.08
Depressed		−.18		.17		−.02		.17		−.18
Positive		$−.24^*$		−.13		−.14		−.05		$−.33^*$
Step 2	$.08^*$		.02		.01		.03		.00	
SOM-A		−.01		.05		.08		−.63		−.13
SOM-D		−.83		−.40		−.32		.04		−.12
Total R^2	$.24^{**}$		$.32^{**}$		$.18^*$		$.26^*$		.14	

Note. Given the number of regression analyses, only significant results are summarized here. RCMAS = Revised Children's Manifest Anxiety Scale; A-Trait = State–Trait Anxiety Scale for Children, Trait scale; FSSC-R = Fear Survey Schedule for Children–Revised; CDI = Children's Depression Inventory; Diagnosis = independent evaluator's diagnosis from the Anxiety Disorder Interview Schedule for Children; Anxious = anxious self-statements; Depressed = depressed self-statements; Positive = positive self-statements; SOM-A = states-of-mind ratio calculated with anxious self-statements; SOM-D = states-of-mind ratio calculated with depressed self-statements.
$^* p < .05.$ $^{**} p < .001.$

Table 4

Summary of Path Coefficients From Hierarchical Regression Analyses Testing Self-Statements as Mediators of Treatment Outcome

Measure	Path A	Path B	Path C_1	Path C_2
Anxious				
RCMAS	.35**	.34**	.26**	.16
A-Trait	.35**	.37**	.27**	.16
FSSC-R	.35**	.30*	.27*	.19
CDI	.35**	.39**	.29*	.17
SOM-A				
RCMAS	.40**	.46***	.26*	.10

Note. RCMAS = Revised Children's Manifest Anxiety Scale; A-Trait = State–Trait Anxiety Scale for Children, Trait scale; FSSC-R = Fear Survey Schedule for Children–Revised; CDI = Children's Depression Inventory; Anxious = anxious self-statements, SOM-A = states-of-mind ratio calculated with anxious self-statements.
* $p < .05$.   ** $p < .01$.   *** $p < .001$.

to examine mediation. Treatment status predicted SOM-A change (Path A), SOM-A change predicted anxiety on the RCMAS (Path B), and the strength of the association between treatment status and outcome on the RCMAS was decreased when the SOM-A ratio was entered (Path C). Thus, changes in the SOM-A ratio mediated only one anxiety outcome ($z = 2.4$, $p < .05$; see Table 4). When examining the SOM-D ratio, treatment status did not predict changes in the SOM-D (Path B), and hence mediation was not supported.

Discussion

The current study of the mediation of treatment outcomes for youth with AD found that anxious self-statements were meaningfully related to childhood anxiety disorders and their treatment. Anxious—but not depressed or positive—self-statements evidenced a significant relationship to anxiety disorders and to therapeutic improvement. These results, consistent with those reported by Treadwell and Kendall (1996), support the assertion that negative self-statements focusing on content oriented to threat and harm, as opposed to content focusing on significant loss or well-being, are predictive of anxious maladjustment (Kendall, 1985; see also Prins & Hanewald, 1999). Higher functioning (e.g., lesser anxiety) was linked to fewer anxious self-statements for youth with and without AD; there was not a significant relationship to (greater) positive self-talk. Depressed, and not anxious, self-statements specifically predicted depressive symptoms, further supporting content specificity. For children with AD, anxious self-statements significantly predicted anxiety severity after treatment. These findings suggest that as there are changes in children's anxious distress, there are associated/accompanying reductions in anxious self-talk—this has been referred to as "the power of nonnegative thinking" (Kendall, 1984, p. 61).

Consistent with previous research, mixed support was found for the SOM model as applied to children. The SOM-A ratio was related to only one measure of psychological functioning (depression) and did not predict changes in child functioning following treatment after accounting for anxious self-statements. Control

children's SOM-A ratio fell within a somewhat distressed category reflecting adaptive coping to distressful situations, as did the SOM-A for children with AD. However, clinically treated children improved their SOM-A ratio in that they improved to the positive dialogue category. These results are consistent with findings from research with adults (Heimberg, Bruch, Hope, & Dombeck, 1990; Marchione et al., 1987). These data suggest that the presence of anxious self-statements reflect the activation of a pathological anxiety schema, which generates the greater number of anxious cognitive products (assessed as self-statements). Reducing this anxious self-talk is reflected in the diminished anxious symptoms in the treated children.

Anxious self-statements were found to be a mediator of change, but less support was noted for the SOM-A ratio as a mediator of change (it mediated only one outcome measure, self-reported anxiety). These findings are consistent with the notion that cognitive change influenced the gains that were identified following CBT. Note that components of CBT address the self-talk of anxious youth: identifying their fearful thoughts, providing challenging exposure tasks to test out beliefs, pre- and postexposure discussions of the thinking that took place, and the creation and rehearsal of coping thoughts to combat unwanted anxious arousal. Although the present results do not exclude other potential mediators, they nevertheless do suggest that cognitive functioning (i.e., self-talk) may serve an important mediational role in treatment for youth with AD.

But what about the content of the negative self-talk? The present findings provide support for the specificity of anxious self-statements in children with AD (who were not comorbid for depression). Consistent with theory, children with AD and control children differed on the frequency of anxious self-statements, but not depressed or positive self-statements. Anxious self-talk was significantly related to several measures of anxiety and fear, and changes in anxious self-statements across treatment predicted changes in anxiety and fear following treatment. Depressed self-statements were only associated with depression, and not with anxiety (with anxious self-talk factored out). It is notable that anxious self-talk and not depressed self-talk mediated outcomes. These findings are consistent with notions of content specificity (with one exception) and provide somewhat greater support for content specificity than in Treadwell and Kendall (1996). The mediating role of negative, and not positive, self-statements is consistent with the tripartite model (Watson & Clark, 1984), in which the commonality between anxiety and depression is negative self-statements and affect but not positive self-statements that are, in their absence, specific to depression.

The reliability and validity of self-statements are difficult to assess, as there can be questions as to the accuracy of children's self-report and lack of external validating standards to determine accuracy (Kendall & Korgeski, 1979). Although several methodologies for assessing self-statements exist, the endorsement method that was used in this study can facilitate recall, and is a psychometrically sound measure of self-talk, valid for testing cognitive models (Arnkoff & Glass, 1989; Glass & Arnkoff, 1997; Heimberg, Bruch, et al., 1990; Sturmer, Bruch, Haase, & Amico, 2002).

We sought to examine the role of theoretically meaningful mediators of treatment outcomes—a step toward an empirical

basis for stating how treatments work. The mediation analyses in this study met several criteria set for demonstrating mechanisms of change (Kazdin & Nock, 2003). First, there existed a strong association between treatment assignment and changes in anxious self-statements and the SOM ratio. Second, specificity was established in that anxious cognition and the SOM ratio, but not positive or depressed self-statements, partially mediated outcome. Third, there was consistency in this study's results, in that anxious cognition and in part the SOM ratio were identified as potential mechanisms, replicating previous results in a separate but similar sample of children. Finally, the variables tested for mediation were plausible and coherent as articulated in cognitive models of anxiety. Nevertheless, several suggested requirements to support change mechanisms (Kazdin & Nock, 2003) were not addressed in this study. A dose-dependent relationship was not examined, and the proposed mediators were not experimentally manipulated. Finally, variables other than cognition were not explored as potential mediators (e.g., parental variables such as overcontrol). Another caveat is that common method variance may, in part, contribute to the findings. Although there were associations for parent- and teacher-reports of child functioning, the child-reported self-statements were primarily related to child-reported functioning and mediated child-reported outcome.

The identification and replication of cognitive changes as partial mediators of CBT for youth with AD suggest that they are important ingredients. Future research might manipulate dose of self-talk change to examine whether dose is associated with greater efficacy. Should support be provided, it buttresses the role of the mediator and could facilitate the transportation of an empirically-supported treatment to community providers (Kraemer et al., 2002). Future mediational research would benefit from assessments at multiple points (Kazdin & Nock, 2003) to further establish temporal precedence to anxiety reduction.

Although changes in anxious self-talk were found to partially mediate treatment gains, it is not yet clear how such changes are processed and then incorporated into existing belief systems. Nor is it clear whether new self-statements simply replace dysfunctional anxious self-talk, or whether new self-talk provides an additional (new) schema or structure through which new events can be experienced and processed differently. The extent to which alterations in self-talk are involved in producing long-term change in underlying schema and distorted processing awaits empirical analysis. It is also worth noting that other potential mediators should be examined—changes in self-talk only partially mediated outcome for child-report measures. Alternative mediators of theoretical relevance should be explored.

Developmental considerations merit further study. We know precious little about the development of the social and emotional cognitive constructs that impact anxiety. The downward extension of adult models is not satisfactory, and theory must be guided by developmental norms and differences (e.g., Daleiden & Vasey, 1997). In this study we examined late childhood, but we recognize that the change process for younger children and for adolescents may be quite different. Uniformity in cognitive processes across childhood (e.g., Kendall, 1984) is not likely. Future research and theory would benefit from examinations of potential variations in cognitive change processes across the lifespan.

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