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Predictors of outcome in a cognitive-behavioral group program for children and adolescents with social anxiety disorder

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ABSTRACT

The present study examined predictors of treatment outcome among children and adolescents with social anxiety disorder (SAD). Seventy-five participants (8–13 years) participated in a 12-session cognitive behavioral group treatment (CBT). Potential predictors were the pre-treatment severity of anxious symptoms assessed from both the child's and parent's perspective as well as depressive symptoms (child report only) and general emotional distress in parent (parent self-report). Furthermore, the relationship between treatment outcome and child's self-reported pre-post changes in self-consciousness and maladaptive anxiety regulation was investigated. Pre-treatment level of social anxiety reported by the child was a significant predictor for outcome, i.e. children with higher levels of social anxiety at pretreatment reported a greater reduction in social anxiety at post-treatment. Reduction in self-consciousness and maladaptive anxiety regulation both predicted reduction in social anxiety, although not independently. The results suggest that tailoring intervention to include strategies for emotion regulation of anxiety may improve treatment outcome.

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1. Introduction

Social anxiety disorder (SAD) is among the most common disorders of childhood and adolescence and is associated with impairment in child development (Costello, Egger, & Angold, 2005). Therefore, the development of effective treatments is necessary. Behavioral and cognitive behavioral treatments are among the most effective interventions for the treatment of anxiety disorders, both in children and adolescents. However, current empirical evidence shows that only half to two-thirds of the children benefit in terms of significant symptom reduction or diagnostic recovery at post-treatment (for reviews see In-Albon & Schneider, 2007; Olatunji, Cisler, & Tolin, 2010; Silverman, Pina, & Viswesvaran, 2008). Furthermore, there are hints that socially anxious youth do not benefit as much from CBT in comparison to children and adolescents with other anxiety disorders (e.g., Crawley, Beidas, Benjamin, Martin, & Kendall, 2008). To date, studies examining reasons for the differential outcomes are sparse. Previous research on predictors of treatment outcome focused on pretreatment symptomatology in children and parents as well as on change processes (such as emotion regulation), primarily in children with various anxiety disorders.

1.1. Pretreatment symptomatology in children and parents

1.1.1. Severity of anxiety and comorbidity with depressive symptoms in children

High symptom severity of anxiety and large impairment has been found to be associated with high comorbidity rates in children and adolescents suffering from anxiety disorders (e.g., Kendall et al., 2010). Several studies have already examined comorbidity as one potential predictor for poor treatment outcome including children with various principal anxiety disorders, such as separation anxiety disorder, generalized anxiety disorder, specific phobia and SAD. The majority of these studies indicate that comorbid disorders generally have no or only small effects on the treatment outcome (for an overview see Olatunji et al., 2010; Ollendick, Jarrett, Grills-Taquechel, Hovey, & Wolff, 2008). However, studies investigating the impact of depressive symptoms instead of disorders as a possible predictor for treatment outcome have produced contradictory findings. Whereas in some studies high symptom levels of depression and/or comorbid mood disorders have been found to predict poorer treatment outcomes, other studies were not able to replicate these findings (e.g., Berman, Weems, Silverman, & Kurtines, 2000; Southam-Gerow, Kendall, & Weersing, 2001). Inconsistent results were also found for studies with samples of children with a primary diagnosis of SAD. Crawley et al. (2008) concluded from their study with SAD children that comorbid mood disorders were likely to be responsible for a worse treatment outcome. In contrast, Alfano et al. (2009) found no moderating effect of child reported

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depressive symptoms on several outcome measures after treating SAD children with Social Effectiveness Therapy for Children (SET-C). Some of the discrepant results may be due to the different assessment methods for depressive symptoms in children (e.g., questionnaire vs. structured interview) and the severity of the symptoms (meeting the threshold for a clinical diagnosis).

1.1.2. Parental psychopathology

Models explaining the development of anxiety disorders emphasize the importance of parental influence (e.g., Rapee & Spence, 2004). Therefore, several studies have investigated the relationship between parental psychopathology and treatment outcome in children suffering from heterogeneous anxiety disorders. However, studies on this topic have yielded mixed results. These vary from parental psychopathology having either a positive (e.g. Legerstee et al., 2008), no (e.g. Victor, Bernat, Bernstein, & Layne, 2007; Wood, Piacentini, Southam-Gerow, Chu, & Sigman, 2006) or a negative effect on treatment outcome in children with anxiety disorders. With respect to anxiety disorders in general, studies thus show inconsistent findings concerning the impact of parental psychopathology on treatment efficacy. Moreover, it remains unclear whether disorder-specific differences could explain the above-mentioned findings, due to a lack of studies focusing on one specific anxiety disorder like SAD for example.

In sum, studies with inconsistent results investigating pre-treatment symptomatology as a possible predictor for treatment outcome focus primarily on children with various anxiety disorders and not specifically on children with SAD, with the exception of two studies (Alfano et al., 2009; Crawley et al., 2008).

1.2. Changes in processes during treatment

Although research has consequently pointed out the importance of change processes during treatment for outcome measures, these processes are not yet well understood. Only few studies have investigated potential disorder-specific or transdiagnostic processes of change during treatment as potential moderators or mediators for treatment outcome in children suffering from anxiety disorders. In one study, treatment response of children with various anxiety disorders was mediated by changes in anxious self-statements (Kendall & Treadwell, 2007). Alfano et al. (2009) focused on children with SAD only. They found that child-reported changes in loneliness, as one feature of SAD, mediated changes in social anxiety. Among some of the theoretically significant processes for change in SAD symptomatology may be those related to self-consciousness and general maladaptive anxiety regulation.

1.2.1. Self-consciousness and social anxiety

Research in adult samples has shown that high levels of self-consciousness or self-focused attention play an important role in the maintenance of social anxiety (Bögels & Mansell, 2004; Clark & Wells, 1995; George & Stopa, 2008). Furthermore, there is evidence that cognitive behavioral treatment for adults with SAD leads to a significant decrease in self-focused attention and self-focused thoughts, and that these changes are related to lower social anxiety at post-treatment (Hofmann, 2000; Woody, Chambless, & Glass, 1997). In contrast to the literature focusing on adults, only few studies have investigated this relation in child or adolescent populations. One study by Higa, Phillips, Chorpita and Daleiden (2008) showed that self-consciousness was significantly correlated with youth self-reported social anxiety and negative affect. Hodson, McManus, Clark and Doll (2008) also found that high socially anxious children reported more self-focused attention than the non-anxious controls. These results provide preliminary evidence that self-consciousness in children may play a similar significant role in SAD as in adults. However, it is currently unknown

if self-consciousness changes during treatment and if these potential changes in turn play a significant role in predicting changes in social anxiety.

1.2.2. Maladaptive anxiety regulation strategies

A large number of children and adolescents with anxiety disorders are currently not benefiting from available forms of treatment, therefore, several authors suggested that including emotion regulation components could possibly lead to an enhancement of treatment efficacy (e.g., Hannesdottir & Ollendick, 2007). This suggestion is supported by a study in which an emotion regulation treatment component was added to a regular CBT for children with anxiety disorders (Suveg, Kendall, Comer, & Robin, 2006) with generally positive results on the ability to identify emotional states or the understanding of emotion regulation strategies. In a later study, Suveg, Sood, Comer and Kendall (2009) showed that CBT without a supplementary emotion regulation component leads to improvement of worry regulation skills among anxious youths. However, changes in sadness and anger regulation skills were not detected. The change in worry dysregulation predicted change in anxiety scores; change in worry coping, however, did not. In light of these results and the fact that our group treatment generally did not focus on dysfunctional emotion regulation, we investigated only the changes in maladaptive anxiety regulation strategies, as one possible predictor of change in social anxiety after treatment in children with SAD.

As described above the limited research on predicting treatment outcome has typically been examined in children and adolescents with heterogeneous anxiety disorders and offers mixed results. Therefore, the purpose of the present study was to specifically examine predictors of outcome in a homogenous sample of children with SAD: (1) the effects of children's pretreatment anxious and depressive symptomatology (2) the effect of parents' pretreatment psychopathology on changes in children's anxiety and (3) changes in self-consciousness and maladaptive anxiety coping predicting changes in anxiety from pre- to post-treatment. Based on previous findings it was hypothesized that high levels of child or parent reported pretreatment symptom severity of (social) anxiety and child rated depression predicts less change in (social) anxiety from pre- to post-treatment. Furthermore, it was hypothesized that more severe parent psychopathology predicts poorer (social) anxiety change in children. Concerning the change processes during treatment, we hypothesized that potential changes in self-consciousness would predict changes in (social) anxiety in children as it does in adults. In line with the results of Suveg et al. (2009), it was also hypothesized that change in maladaptive anxiety coping would significantly predict changes in (social) anxiety.

2. Method

2.1. Participants

Seventy-five children (43 girls and 32 boys) between 8 and 12 years ($M = 10.08$; $SD = 1.34$) with SAD as primary diagnosis completed a 12-session group CBT program (Tuschen-Caffier, Kühl, & Bender, 2009). The children participated in two different treatment studies conducted at three centers, aiming at examining the efficacy of this manualized treatment. Details of these studies may be found below (under procedure). Children were included if they met diagnostic criteria for SAD according to DSM-IV based on the child or parent reports taken from a structured clinical interview (Kinder-DIPS; Unnewehr, Schneider, & Margraf, 1998). Thirty-two percent of the children were diagnosed with comorbid disorders: 15 children showed one additional anxiety disorder (29.2% specific phobia, 25% separation anxiety disorder, 4.2% generalized anxiety disorder, 4.2% obsessive compulsive disorder), seven children

(29.2%) were diagnosed with a comorbid diagnosis from the externalizing spectrum (attention-deficit/hyperactivity disorder and/or oppositional defiant disorder) and two children (8.3%) fulfilled criteria for enuresis. Treatment exclusion criteria were: psychotic symptoms, disabling medical conditions, mental retardation and the child's participation in concurrent treatment. For 10.1% of mothers and 18.8% of fathers, no school degree or the lowest form of qualification in Germany's tripartite secondary school system, after 8 or 9 years of schooling, was reported. A total of 38.7% of mothers and 25.3% of fathers, respectively, reported ten years of schooling. Higher education had been obtained by 44% of mothers and 49.3% of fathers. Eight percent did not provide data on their educational level.

2.2. Measures

2.2.1. Diagnostic Interview for Mental Disorders in Children And Adolescents (Kinder-DIPS)

For assessing the diagnosis of SAD according to DSM-IV, we used the Kinder-DIPS (Unnewehr, Schneider, & Margraf, 1998). This structured interview consists of a child and a parent interview. Besides SAD, the Kinder-DIPS assesses all anxiety disorders, depression, attention-deficit hyperactivity disorder, opposition defiant disorders, eating disorders, and elimination disorders with an interview form for the child and the parent. The parent interview was either conducted with the mother, the father or both parents together but separate from the child. The validity and reliability of the Kinder-DIPS for the assessment of anxiety disorders and other axis I disorders ranges from satisfying to good. Kappa coefficients for inter-rater reliability of diagnosis categories vary from .55 to .81 (Unnewehr et al., 1998). The Kinder-DIPS was conducted by trained master-level clinical psychologists.

2.2.2. Social Phobia and Anxiety Inventory for Children (SPAI-C)

To assess the SAD symptom severity, we administered the German version of the Social Phobia And Anxiety Inventory for Children (SPAI-C; Beidel, Turner, & Morris, 1995; Melfsen, Florin, & Warnke, 2001). The SPAI-C is a 26-item self-report measure that assesses a range of potentially anxiety-producing situations (e.g., reading aloud or performing in a play) and physiological, cognitive and behavioral symptoms of SAD. Each of the items rated on a 3-point Likert scale represents the frequency of each symptom (0 = never, 1 = sometimes, 2 = most of the time or always). Scores range from 0 to 52. Internal consistency in the present study was high (Cronbach's alpha = .93 at pre- and post-treatment).

2.2.3. Children's Depression Inventory (CDI)

We used the German version of the Children's Depression Inventory (Kovacs, 1992; Stiensmeier-Pelster, Schürmann, & Duda, 2000), a self-report measure of depression for children and adolescents between 8 and 16 years. It comprises 26 items assessing cognitive, affective and behavioral signs of depression. Children indicate on each item whether it describes their state during the past two weeks. Total scores range from 0 to 52, with higher scores indicating greater depression. In the current study, the German version of the CDI had an internal consistency of Cronbach's alpha = .84 and .88 at pre- and post-measurement, respectively.

2.2.4. Child Behavior Checklist (CBCL)

Parents completed the 113-item German version of the Child Behavior Checklist (Achenbach, 1991; Arbeitsgruppe Deutsche Child Behavior Checklist, 1998) to assess their child's emotional and behavioral problems. The items are scored on a 3-point Likert scale ranging from 0 = not true to 2 = often true. Normative data for a German population are available. With respect to our hypotheses, we only used the global sum score (range from 0 to 236) and

an "anxious subscale" (CBCL-A; range from 0 to 32). The latter consists of 16 items and was suggested by Kendall et al. (2007) as a more specific indicator of child anxiety. It has been shown, that the CBCL-A is sensitive to treatment changes and it discriminated children with and without an anxiety disorder. Finally the scale is better in predicting child anxiety status relative to the original CBCL anxious/depressed scale (Kendall et al., 2007). Internal consistency of the CBCL-scales in this study at pre- and post-treatment was Cronbach's alpha = .94-.95 for total score, and Cronbach's alpha = .72-.78 for the anxious subscale

2.2.5. Brief Symptom Inventory (BSI)

To measure parents' psychopathology, the German version of the Brief Symptom Inventory was used (Derogatis, 1993; Franke, 2000). The BSI consists of 53 items covering nine symptom subscales: somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism; and three global indices of distress. For the purpose of the present study, we used the "global severity index" for clinically relevant psychological distress as predictor. Cronbach's alpha was .94 in the present study. Seventy mothers and five fathers completed the BSI at pretreatment.

2.2.6. Self-consciousness Questionnaire for Children and Adolescents (SCQ-C)

The SCQ-C is a self-report questionnaire assessing private and public self-consciousness in children and adolescents (Bender, Kley, & Tuschen-Caffier, 2007). Each of the 16 items is rated on a 5-point frequency rating scale. In addition to a total sum score (range from 16 to 80), four 4-item subscales describe private and public consciousness, respectively, with and without reference to body sensations, e.g. "I quickly become aware that my heart is beating" (private body consciousness), "I pay attention to my own moves and body posture" (public body consciousness), "I quickly become aware when my emotions change" (private without body) or "I think about the sound of my voice" (public without body). We used the total sum score of the SCQ-C. Data from more than 1900 German children and adolescents demonstrated good psychometric properties (Bender et al., 2007). Cronbach's alpha for the current sample was .86 at pre- and .92 at post-treatment

2.2.7. Questionnaire to Assess Children and Adolescents' Emotion Regulation (FEEL-KJ)

The FEEL-KJ (Grob & Smolenski, 2005) is originally a 90-item self-report measure to assess emotion regulation strategies in response to anxiety, sadness and anger with 15 primary scales. The instrument also includes two secondary scales: the "adaptive strategies scale" for the assessment of seven functional strategies (acceptance, problem-oriented action, cognitive problem solving, distraction, neglect, reevaluation and put into good humor). The strategies giving up, aggressive action, withdrawal, self-devaluation and perseveration constitute the "Maladaptive Strategies Scale". Primary and secondary scales can be provided for all three emotions or for each emotion independently. All items are rated on a 5-point scale ranging from 1 = almost never to 5 = almost always. Based on Suveg et al.'s (2009) results and our hypotheses, we only used the 10-item Maladaptive Strategies Scale (MAS), which focuses on anxiety. Each of the five maladaptive strategies is assessed by two items. "When I am anxious, I start a quarrel with somebody." is an example for the aggressive action strategy and "When I am anxious, I withdraw into myself." for the withdrawal strategy. Scores range from 10 to 50. The internal consistency in the current study for the Maladaptive Strategies Scale (MAS) was Cronbach's alpha = .52 and .75 at pre- and post-treatment, respectively.

2.3. Procedure

2.3.1. Recruitment and assessment

Participants were recruited through child health professionals (child psychologists, psychiatrists, child mental health centers), family information centers and announcements on the Internet, in local newspapers or magazines, and in schools, offering participation in the context of two larger projects about social anxiety. Children and their parents were initially screened with a short telephone interview assessing sociodemographic variables such as age, gender and their history of fears. Families were then invited to an assessment session, during which they were asked to provide informed written consent, after which they were interviewed using the structured interview as described above. All children completed the self-report forms (children: SPAI-C, CDI, SCS-Q, FEEL-KJ; parents: CBCL) prior to starting the treatment and after receiving the intervention (post) in a paper pencil version or via the internet online at home. The BSI was assessed only once (prior to intervention). Internal consistencies of measures were similar independent of the sampling method used (paper pencil vs. online). Data was collected at three different sites, either in the context of a randomized controlled treatment trial (RCT) or in a waitlist-control group design. At the two RCT-centers, children ($n = 53$) who met the inclusion criteria were then randomly assigned either to the treatment or to the waitlist control condition. Children in the treatment condition started their treatment straight away, while children in the waitlist control condition had to wait a further 9 weeks before completing the questionnaires for a third time directly prior to beginning their treatment (Tuschen-Caffier, Krämer, Seefeldt, Breuninger, & Heinrichs, in preparation). At the non RCT-center, all children ($n = 22$) started treatment after the waiting time. Thirteen participants were excluded from the total sample due to incomplete or missing data at pre- and/or post-treatment resulting in a total sample size of 75 children with SAD. One child decided against returning after the sixth session.

2.3.2. Intervention

The group treatment consisted of 12 sessions, each lasting 90 min, over a nine-week period. The cognitive-behavioral manual-based intervention included (1) recognizing anxious feelings and somatic reactions, (2) recognizing and modifying social phobic cognitions, (3) role play for practicing social competent behavior, and (4) in vivo exposure to anxious situations (Tuschen-Caffier et al., 2009). The treatment was delivered by master-level clinical psychologists with advanced training in CBT and graduate students of clinical psychology. All treatment sessions were videotaped and reviewed during the continuous supervision by the second and last author. Ethical approval for this study was obtained from an independent ethic committee.

2.4. Statistical analysis

In order to examine pretreatment differences between groups we used χ^2 tests to compare frequencies with respect to gender, parents' educational level and comorbidity. Analyses of variance were used to test differences with respect to age, social anxiety severity (SPAI-C-Score at pretreatment) and parent report of symptom severity (CBCL-A-Score).

Missing data did not exceed 5%, with the exception of the MAS at post-treatment for which 9% of the values were missing. Missing data analysis revealed no pattern to the occasional missing scores. Thus, missing values were imputed using the expectation-maximization algorithm (Schafer & Graham, 2002) through SPSS MVA (Little's MCAR test, $p = .41$). Repeating analyses with and without missing values showed similar results. A

Table 1

Means and standard deviations of study variables and pre–post comparison with RM-MANOVA.

Variable	Pre ($n = 75$)	Post ($n = 75$)	$F(6, 69)$	p	d
Child self-report					
SPAI-C	21.62 (9.44)	18.18 (9.65)	11.70	.001	.36
CDI	11.36 (6.42)	8.82 (6.53)	16.72	<.001	.39
SCQ-C	42.50 (11.79)	41.34 (13.04)	.91	.34	.09
MAS	24.75 (5.66)	23.20 (6.83)	4.03	.05	.25
Parent report of child					
CBCL Total score	43.75 (21.34)	31.71 (22.35)	45.85	<.001	.55
CBCL Anxious Subscale	11.76 (4.52)	8.80 (4.64)	35.10	<.001	.65
Parent self-report					
Global severity index (BSI)	.38 (.33)				

Pre = pretreatment; Post = post-treatment; SPAI-C = Social Phobia and Anxiety Inventory for Children; CDI = Children's Depression Inventory; SCQ-C = Self-Consciousness Questionnaire for Children and Adolescents; MAS = Maladaptive Strategies Scale with respect to anxiety; CBCL = Child Behavior Checklist; BSI = Brief Symptom Inventory.

repeated measure multivariate analysis of variance (RM-MANOVA) examined pre–post changes in children and parent reports. In addition, the effect sizes (Cohen's d for dependent variables) were calculated to provide an outcome measure independent of sample size.

Blockwise linear regression analyses were used to examine predictors of pretreatment symptomatology and outcome change scores. With respect to assumptions of a regression analysis, Durbin–Watson statistics showed independence and no multicollinearity as can be seen from the Tolerance and VIF statistics. Univariate and multivariate outlier-analysis were conducted with inspection of box-plots, the residuals and computing the Mahalanobis's distance. No outliers were found. All analyses were conducted using PASW Statistics 18.

3. Results

3.1. Preliminary analysis

3.1.1. Did pretreatment differences exist dependent on site?

The children from the three centers were compared with respect to age, gender, social anxiety severity (SPAI-C-Score at pretreatment), comorbidity, parent report of symptom severity (CBCL-Scores) and parental education level either through an analysis of variance (ANOVAs) or χ^2 tests. The groups did not show significant differences in these characteristics (all p values $>.05$).

3.1.2. Treatment outcome: did the treatment have a benefit?

After the completion of the twelve group treatment sessions, children reported significantly less social anxiety symptoms on the SPAI-C, significantly lower depression scores measured with the CDI and decreased maladaptive anxiety regulation strategies. The means of the SCQ-C suggested a slight decline in children's self reported self-consciousness; however, this pre–post difference did not reach statistical significance (see Table 1). The RM-MANOVA with repeated measures for the analysis of pre–post differences in the parents' CBCL reports showed a significant reduction of the total sum score as well as in the anxious subscale (CBCL-A)

Table 1 summarizes means and standard deviations for all dependent variables at pre and post assessment as well as the F statistic from the RM-MANOVA and effect sizes for pre–post comparisons.

3.2. Predictor analysis

3.2.1. Did children's pretreatment symptomatology and parent psychopathology predict changes in child-rated social anxiety or in parent-rated child anxiety?

We conducted two multiple regression analyses with one using treatment related improvements of child-rated social anxiety (pre–post changes of SPAI-C scores) as the dependent variable and the other with treatment related improvements of parent-rated anxious symptoms (pre–post changes of CBCL-A scores) as the dependent variable. Three types of pretreatment variables were entered in these analyses: (a) symptom severity of social anxiety (SPAI-C) and depression (CDI) from the child's perspective, (b) anxious symptoms of the children from the parents' perspective (CBCL-A), and (c) global severity index (BSI) used for indicating the level of psychological distress for the participating parent. Table 2 shows correlations between study variables. In the first multiple regression analysis with SPAI-C change scores as dependent variable only one of four predictors was significant (see Table 3). Children's reported social anxiety on the SPAI-C significantly predicted changes in anxiety. Higher levels of child social anxiety were associated with greater changes in social anxiety, and thus better treatment response. The contribution of children's self-reported social anxiety at pretreatment accounted for 18.4% of the overall variance in social anxiety changes. Children's pretreatment CDI-Scores and parents' self reported psychopathological symptoms on the BSI, respectively, as well as parents' ratings of the child's anxious symptomatology (CBCL-A) had no significant influence on children's self-reported anxiety changes in the regression model. Similar results occurred in the second multiple regression analysis with change scores of parent-rated child's anxiety as the dependent variable. Except for the pretreatment CBCL-A scores no further variable was a significant predictor for treatment related improvement in child anxiety from parents' perspective (see Table 3).

3.2.2. Did changes in self-consciousness and maladaptive anxiety coping strategies predict changes in child-rated social anxiety and parent-rated child anxiety?

For both dependent outcome variables three separate regression analyses were conducted to test this hypothesis. In order to control for the impact of pretreatment scores of self-consciousness and maladaptive anxiety coping strategies on changes in self-consciousness (SCQ) and maladaptive anxiety coping strategies (MAS), these variables were additionally entered as predictors. In the first regression analysis, we entered self-consciousness at pretreatment and pre–post changes of this variable as predictors and SPAI-C change score as dependent variable. As summarized in Table 4, the pretreatment SCQ-C score was not associated with changes in social anxiety, whereas changes in children's self-consciousness significantly predicted changes in social anxiety ($p = .006$).

In the second regression analysis we entered pretreatment maladaptive anxiety coping scores and the pre–post changes of this variable as a predictor and, again, changes of the SPAI-C score as dependent variable. We found no association between MAS pretreatment scores and anxiety change. However, the MAS change score significantly predicted the SPAI-C change score again, $p = .006$ (Table 4).

In a last step, we entered both, changes in self-consciousness (SCQ-C) and changes in maladaptive anxiety coping (MAS) as predictors to determine if they explained an independent amount of variance of the overall social anxiety change (SPAI-C). Both change scores together accounted for 15% of the SPAI-C change score variance ($p = .003$). However, only changes in maladaptive anxiety coping predicted changes of social anxiety from pre-

post-treatment ($p = .03$), whereas changes in self-consciousness did not reach statistical significance ($p = .09$).

Similarly, we conducted three multiple regression analyses to test the predictive value of pretreatment SCQ-C and MAS scores and the pre–post change scores of these variables for changes in parent-rated child anxiety (CBCL-A score). As summarized in Table 4, the first multiple regression analyses with the change score in parent-rated child anxiety as dependent variable indicated that neither the pretreatment SCQ-C score nor changes in children's self-consciousness were associated with changes in parent-rated child anxiety. We also found no association between MAS pretreatment scores and anxiety change in the second regression analysis. Finally, neither the SCQ-C nor the MAS change scores predicted parent-rated child anxiety changes significantly when considered separately (Table 4). However, when both change scores were considered simultaneously, both just met the threshold for significant predictors but nevertheless only accounted for 5% of the CBCL-A change score variance ($p = .05$). Relative to child self-report of social anxiety, parent-rated positive change in child anxiety was also associated with the amount of diminished self-consciousness in children. In contrast, less positive change in maladaptive anxiety coping predicted more positive change in parent-rated child anxiety.

4. Discussion

The aim of the present study was to investigate potential predictors of CBT outcome in children with a primary SAD diagnosis. In general, children with a principal diagnosis of SAD benefited from the 9-week (12 session) CBT group program, both with respect to child and parent ratings. The significant within-treatment effects are comparable with results of other outcome studies, which investigated the efficacy of CBT in children and youths suffering from anxiety disorders (e.g., In-Albon & Schneider, 2007; Silverman et al., 2008). However, the medium to large effects of this study as well as of other outcome studies show clearly that not all included children benefit equally well from CBT. Therefore, identifying predictors of outcome to improve treatment for these children may be a helpful step.

Child reported social anxiety severity assessed with the SPAI-C occurred as a significant predictor for the reduction in SAD symptoms, i.e. the more socially anxious the child was at pretreatment, the larger the decline in social anxiety at post-treatment. Similarly, parent reported child anxiety severity assessed with the CBCL-A occurred as a significant predictor for the reduction in parent-rated child anxiety; i.e. the more anxious parents perceived their children at pre-treatment, the larger the reported decline in anxiety at post-treatment according to parental report. This means that especially children who suffer from severe SAD symptomatology may benefit the most from CBT and thus showed the greatest decline in (social) anxiety. However, results also indicate that more severe (social) anxiety symptomatology at pretreatment is still associated with higher (social) anxiety severity at post-treatment (SPAI-C: $r = .59$, $p < .001$; CBCL-A: $r = .55$, $p < .001$). Furthermore, it is possible that the association between pretreatment severity and degree of change is influenced by regression towards the mean or due to the linear interdependence of predictor and outcome variable.

Contrary to our hypothesis neither parents' ratings of child anxiety symptoms nor child rated depressive symptoms predicted social anxiety reduction. Our results are in line with those from Alfano et al. (2009) who also found that depressive symptoms in children with SAD did not moderate the outcome. Depressive symptoms do not seem to impair beneficial effects of CBT in SAD, at least at the present level of depression. It remains unclear whether stronger depressive symptoms or a comorbid depressive disorder

Table 2
Correlations among study variables.

	1	2	3	4	5	6	7	8	9
1. SPAI-C pre	–								
2. CDI pre	.31**								
3. CBCL-A pre	.25*	.16							
4. BSI: global severity index	.13	.34**	.37***						
5. SCQ-C pre	.23*	.32**	.27*	.36**					
6. MAS pre	.43***	.29**	.17	.08	.36***				
7. SCQ-C – change	.01	.16	.06	.05	.32**	.25*			
8. MAS – change	.22	.05	–.11	–.21	–.08	.40***	.40***		
9. SPAI-C – change	.44***	.19	–.07	.00	.03	.14	.31**	.34**	
10. CBCL-A – change	.05	–.14	.45***	.06	.05	–.06	.15	–.15	–.08

SPAI-C=Social Phobia and Anxiety Inventory for Children; CDI=Children’s Depression Inventory; SCQ-C=Self-Consciousness Questionnaire for Children and Adolescents; CBCL-A=Child Behavior Checklist-Anxious Subscale; BSI=Brief Symptom Inventory; SCQ-C=Self-Consciousness Questionnaire for Children and Adolescents; MAS=Maladaptive Strategies Scale (anxiety).

* $p < .05$.
** $p < .01$.
*** $p < .001$.

may have a more negative impact on primary outcome. Our study resembled the Alfano et al. (2009) study in that depressive symptom scores were on average rather low and no child fulfilled criteria for a comorbid mood disorder. It is quite typical for this young age group to show low depressive symptom levels and small numbers of mood disorders (Rao et al., 2007), as more severe depressive symptoms will probably develop later, i.e. in consequence of the impairment caused by SAD and with gaining more cognitive insight due to developmental changes. Moscovitch, Hofmann, Suvak and In-Albon (2005), for example, showed in a study with social phobic adults, that changes in social anxiety mediated changes in depres-

sion but not reversed. Future studies aiming at investigating the influence of depressive symptomatology on treatment outcome in social phobic children, therefore, should include older children, with more severe depressive symptomatology or comorbid mood disorder.

Furthermore, based on previous studies and the association between parent and child psychopathology, it was hypothesized that a larger degree of parental psychopathology predicts less changes in social anxiety in children. Again, this assumption was not supported. However, previous results relating to the impact of parental psychopathology on treatment outcome primarily

Table 3
Prediction of change in child self-reported social anxiety and of change in parent-reported child anxiety by symptom measures at pretreatment.

Variables	Pre-post change in child-reported social anxiety (SPAI-C)					Pre-post change in parent-reported child anxiety (CBCL-A)				
	B	SE B	β	R ²	F _{Model}	B	SE B	β	R ²	F _{Model}
				.23	5.17*** (df=4.70)				.25	5.92*** (df=4.70)
Child self-report										
SPAI-C (pre)	.42	.10	.46***			–.003	.05	–.01		
CDI (pre)	.12	.16	.09			–.13	.08	–.20		
Parent report of child										
CBCL-A (pre)	–.36	.22	–.19			.49	.11	.51***		
Parent self-report										
BSI (pre)	–.57	3.14	–.02			–.78	1.53	–.06		

SPAI-C=Social Phobia and Anxiety Inventory for Children; CDI=Children’s Depression Inventory; CBCL-A=Child Behavior Checklist-Anxious Subscale; BSI=Brief Symptom Inventory.

*** $p < .001$.

Table 4
Prediction of change in child self-reported social anxiety and of change in parent-reported child anxiety by child reported changes in self-consciousness and maladaptive anxiety coping strategies.

Variables	Pre-post change in child-reported social anxiety (SPAI-C)					Pre-post change in parent-reported child anxiety (CBCL-A)				
	R ²	B	SE B	β	F _{Model}	R ²	B	SE B	β	F _{Model}
Self-consciousness	.10				3.98* (df=2.72)	.02				.87 (df=2.72)
SCQ-C – pre		–.06	.09	–.08						
SCQ-C – change		.28	.10	.33**						
Maladaptive anxiety coping strategies	.12				4.71** (df=2.72)	.02				.89 (df=2.72)
MAS – pre		.005	.19	.00						
MAS – change		.44	.16	.34**						
Change predictors	.15				6.37** (df=2.72)	.08				3.11** (df=2.72)
SCQ-C – change		.17	.10	.20			.11	.05	.26*	
MAS – change		.34	.16	.26*			–.17	.08	–.26*	

Notes. SPAI-C=Social Phobia and Anxiety Inventory for Children; SCQ-C=Self-Consciousness Questionnaire for Children and Adolescents; MAS=Maladaptive Strategies Scale (anxiety). A positive SCQ-C change score indicates a reduction in child self-consciousness, a positive MAS change score reflects a reduction in dysfunctional emotion regulation related to anxiety. A positive change score in the SPAI-C or the CBCL-A implies better treatment outcome.

* $p < .05$.
** $p < .01$.

included samples of children with various anxiety disorders. The present results show that with a homogenous sample of children with a principal diagnosis of SAD, parental psychopathology plays only a minor role or that there is no actual impact on child social anxiety. However, the level of parental psychopathology was again rather low in this study leaving the possibility of a floor effect. Inconsistent results may also be explained by methodological differences in assessing parental psychopathology in general and more specific symptoms like anxiety and depression (Legerstee et al., 2008; Thienemann, Moore, & Tompkins, 2006; Victor et al., 2007). A more precise measurement of psychopathology could be useful. This has been shown by Cooper, Gallop, Willetts and Creswell (2008), who found that a maternal diagnosis of a generalized anxiety disorder does not influence the treatment outcome, whereas a diagnosis of SAD negatively influenced the latter. Thus, it might be necessary to meet diagnostic criteria for specific emotional disorders to exert impact on child emotional symptoms. Finally, in numerous studies mothers are the primary parental informant though several studies have already indicated that paternal psychopathology may be as relevant for child development (Crawford & Manassis, 2001; Liber et al., 2008; Rapee, 2000). Therefore, in future studies, paternal ratings should be taken into account more systematically. Based on our findings, there is no clear indication for pretreatment predictors that might help identifying SAD non-responders to CBT or those who respond less well than others. This pattern is comparable to the mixed results reported in adult literature (Eskildsen, Hougaard, & Rosenberg, 2009).

The second aim of this study was to investigate treatment change processes. We found evidence that based on child report, change in self-consciousness and in maladaptive anxiety coping predicted changes in social anxiety. However, when considering both simultaneously, only changes in maladaptive anxiety coping were maintained as a significant predictor of change. In comparison, when considering parent report of anxiety symptoms in children, both, changes in self-consciousness and maladaptive coping did only predict changes in parent-rated child anxiety when considered simultaneously. While changes in self-consciousness seem to play a significant role in child rated social anxiety and parent rated child anxiety, changes in maladaptive anxiety coping resulted in the opposite direction when using parent reported child anxiety (and not child rated social anxiety) as an outcome variable. These results imply across informant stability related to the role of self-consciousness but not necessarily in maladaptive anxiety regulation in the treatment of SAD children: the children whose self-consciousness decreased during treatment benefited more with regard to the decline in social anxiety specifically as well as with regard to parent rated child anxiety in general. The degree of self-consciousness at pretreatment had no influence. This result is consistent with findings from adult literature on SAD. Those studies indicate that a decline of self-consciousness is associated with a greater treatment improvement (Hofmann, 2000; Woody et al., 1997). Also the study from Hodson et al. (2008) shows that self-focused attention is a predictor for social anxiety in children aged between 11 and 14 years. Therefore it can be assumed that the maintaining role of increased self-consciousness in SAD in adults may also be relevant for the treatment of children. Consequently, treatments focusing on children and adolescents with SAD should specifically address self-consciousness in order to achieve improvements (Higa & Daleiden, 2008). Our results indicate that CBT treatments without concrete interventions focusing on changing the child's self-consciousness (as the present CBT group program) do not necessarily also lead to a significant reduction of the latter. Waters, Wharton, Zimmer-Gembeck and Craske (2008) found mixed results for whether traditional CBT alone can sufficiently change attentional bias in anxious children. If traditional

CBT is supplemented by a training to direct the focus of attention towards either the task or features of the environment, social phobic adults showed an additional improvement (Rapee, Gaston, & Abbott, 2009). Thus attention retraining techniques, which have already achieved promising results in adults, could probably constitute a useful supplement to traditional CBT treatments in children with anxiety disorders (Coward & Ollendick, 2010). Based on the results of the present study it appears promising to further explore ways in which self-consciousness can be more directly targeted in treatments for SAD in children.

However, results also indicate that changes in these processes may be overlapping with changes in maladaptive anxiety coping. In line with earlier research (see Suveg et al., 2009), the reduction of maladaptive anxiety regulation strategies predicted social anxiety change scores based on child report. Considering the changes in maladaptive anxiety regulation attained through the treatment in this study, effects were small to moderate. More precise comparisons of disorders as well as of treatments are necessary to find out if this smaller effect is due to the specific intervention or the sample: children with SAD may show only smaller changes in maladaptive anxiety regulation strategies compared to children with other principal anxiety disorders. Furthermore, if analyses were repeated with parent report of child anxiety, a reduction in child anxiety (based on parent report) was associated with an increase in maladaptive emotion regulation (based on child report). Therefore, we could not establish across informant stability related to maladaptive emotion regulation. In fact, it seems like parents rate their child less anxious the more maladaptive emotion regulation strategies the child uses. If this result were replicated in future studies, it may imply that parents are unable to identify the dysfunctional role of child internal and external behavior in their anxiety regulation. In fact, they may misinterpret the child behaviors as a sign of anxiety reduction. This would speak for educating parents more comprehensively about the functional and dysfunctional emotion regulation skills that children may engage in to cope with their anxiety. In general, the results suggest that considering specific intervention components, which specifically target emotion regulation, could be another promising attempt to enhance treatments (Hannesdottir & Ollendick, 2007; Suveg, Southam-Gerow, Goodman, & Kendall, 2007). Including parents in this component may be helpful.

Changes in self-consciousness do not seem to be independent from changes in maladaptive emotion regulation skills. Controlling attentional resources are a part or even a necessary precursor of functional emotion regulation skills (Werner & Gross, 2010). The refocusing of attention to positive or neutral emotional stimuli instead of negative stimuli or shifting the attention outwards for obtaining information from the environment is a necessary requirement for children with SAD to have the possibility to recognize positive reactions from interaction partners. Findings from Muris, Mayer, Van Lind and Hofman (2008) also suggest that attentional control is necessary for emotion regulation skills. Against this background, increased self-focused attention also represents a maladaptive strategy to regulate emotions. In future studies it will be important to investigate more precisely how attentional processes and emotion regulation are associated and how both can be measured independently from one another.

The present study has several strengths, including a (1) large homogenous sample of children with SAD as a principal diagnosis, (2) thorough assessment of symptomatology from the child and parent perspective (multi-informant approach), (3) the use of diagnostic interviews to assess disorders and (4) a multi center approach for assessment and treatment. However, some limitations also apply which are (1) that our study, as many other studies, was not primarily designed as a predictor study and therefore the sample size

was small, allowing only a limited number of predictors. (2) The investigation of the predictive value of certain variables for diagnostic recovery at post-treatment was not assessed across sites. (3) The low alpha of the maladaptive anxiety regulation strategies is limiting the present results to some extent. Interestingly, the alpha at pretreatment (.52) is consistent with what is reported in the questionnaire manual (Grob & Smolenski, 2005). This may be due to the heterogeneity of items and might be explained through the different characteristic of the maladaptive strategies that children commonly used prior to treatment. However, at post-treatment the internal consistency increased considerably (.75). This implies that with an overall reduction in the use of these different maladaptive emotion regulation strategies the heterogeneity of the scale reduces considerably. Therefore, it is unclear if the low internal consistency at pre-treatment is a result of a generally heterogeneous questionnaire or if it indeed implies a low reliability. (4) Only a limited age group was included in the present study, and comparisons with other studies need to take into account the different developmental stages of the children. This could be important however, as depressive symptoms as well as self-consciousness are supposed to increase with age. Despite the potential impact of floor effects, several of the investigated predictors in this study actually did explain a significant amount of variance.

5. Conclusions

A promising starting point in the investigation of predictors in order to improve treatment outcomes is to better understand underlying change mechanisms during treatment, which may positively or negatively influence treatment outcome. Instead of focusing on parental psychopathology per se, it might be more beneficial to focus on specific parenting processes, which may mediate this association. Corresponding moderating or mediating variables must be taken into account, which itself could be a starting point for supplementary interventions. A better understanding or even a sound theoretical model about what causes change in social anxiety in children may help considerably in identifying predictors of change.

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