

## Cognitive Correlates of Social Phobia Among Children and Adolescents

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We examined different cognitive phenomena in relation to social phobia among children (aged 7 to 11) and adolescents (aged 12–16) separately. Fifty socially phobic youths were compared to 30 normal control children on measures of social anxiety, social expectation as well as self- and observer-rated performance during two social tasks involving a same-aged peer. Additionally, a video-mediated recall procedure was conducted immediately following the two behavioral tasks to examine specific types of self-talk. Results indicated that socially phobic youths had lower expectations of their performance and rated their actual performance worse than controls during a social interaction task, but not a read-aloud task. Self-ratings of decreased performance among socially phobic youths were corroborated by blind observers. Although differences in specific types of self-talk were found between the two groups, these findings were generally moderated by age. Furthermore, certain cognitive symptoms associated with the disorder were more commonly found among older socially phobic youths. The current findings highlight the importance of considering developmental factors in the presentation and treatment of social phobia in youths.

**KEY WORDS:** social phobia; cognitions; behavioral assessment; negative expectations.

Recent prevalence estimates of childhood social phobia indicate that up to 3–4% of children may be affected (Beidel, Turner, & Morris, 1999), placing it among the most common of childhood psychiatric disorders. As such, identification of factors presumed to both underlie and maintain the disorder has become a burgeoning area of research. Although characterized by physiological reactions such as heart palpitations, sweating, and blushing, it also is generally recognized that social phobia is associated with cognitive symptoms. Cognitive models of adult social anxiety (e.g., Clark & Wells, 1995) propose that socially phobic individuals possess biases in the way they process, attend to, and expect to perform in social

situations. In particular, Clark and Wells' (1995) model poses that within social contexts, attention is shifted away from external social cues and instead is excessively self-focused. The socially phobic individual is characterized as being flooded with negative self-images and thoughts of his/her behavior that occupy the individual's primary focus. These negative self-images are purported to lead to the (inaccurate) belief that others see him/her in the same negative fashion. Overall, this process is considered to result in perpetual feelings of excessive anxiety and expectations of decreased social performance over time.

The presence of negative cognitions, irrational beliefs, and low expectations of performance all have support in the adult social phobia literature (e.g., Beidel, Turner, & Dancu, 1985; Foa, Franklin, & Perry, 1996; Rapee & Lim, 1992). In fact, such findings have led to the general belief that cognitive factors assist in maintaining emotional distress and behavioral avoidance. By comparison, research examining cognitive features of childhood social phobia has only begun to accumulate. Although empirical data continue to emerge (e.g., Bogels & Zigterman, 2000; Chansky & Kendall,

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1997; Kendall & Chansky, 1991; Spence, Donovan, & Brechman-Toussaint, 1999), overall results are less robust than is commonly found within the adult literature. Specifically, although some child studies have reported the presence of aberrant/dysfunctional cognition among socially phobic youths, other studies have not. Indeed, there are several possible explanations for these divergent findings including differences in methodology and types of measurement, a lack of attention to developmental factors and competing definitions of the term "cognition" (see Alfano, Beidel, & Turner, 2002 for review of this literature).

Among the available studies, Spence et al. (1999) examined cognitive content in relation to a social-evaluative task. Using a video-mediated recall procedure, socially phobic children and adolescents (ranging from 7 to 14 years of age) reported a significantly greater number of negative cognitions compared to their nonanxious peers. Using a verbal thought-listing procedure, Beidel (1991) also assessed self-talk among socially phobic, overanxious, and normal control children following a social-evaluative task. All groups reported few thoughts when actually engaged in the task. Furthermore, there were no significant differences for any type of cognition. Also using a thought-listing procedure, children and adolescents (ages 9 to 15 years) diagnosed with DSM-III-R overanxious disorder, avoidant disorder, and separation anxiety disorder did not report more negative self-evaluative thoughts than normal controls, but they did report more negative thoughts overall (Chansky & Kendall, 1997). Taken together, these disparate findings illustrate the lack of clarity regarding cognitive phenomena and childhood social phobia.

Comparatively, research examining social expectation has produced somewhat more consistent results. Available empirical data indicate that socially phobic children tend to have poorer expectations of their performance within social contexts than normal control children. For example, socially phobic children expected to perform more poorly on both a role-play and read-aloud task than normal control children (Spence et al., 1999). Interestingly, however, after the task, there was no group difference for self-evaluated performance ratings. Thus, socially phobic children's lower expectations were not confirmed by their perceptions of their performance. Also with regard to social expectancies, anxiety-disordered children endorsed significantly higher levels of negative expectation in anticipation of a social interaction with a peer compared to control children (Chansky & Kendall, 1997). Unfortunately, because children did not rate their actual task performance, it is unclear how these expectations compare to self-ratings of actual performance. Thus,

although available data suggest that anxious children expect to perform less well than their peers in social situations, it is not clear whether socially phobic children perceive their actual performance differently (i.e., poorer) than normal children. Meanwhile, among adult samples of social phobics, such differences have commonly been reported (Alden & Wallace, 1995; Beidel et al., 1985; Rapee & Lim, 1992; Wallace & Alden, 1997).

A related area of study involves the role of emotional understanding in childhood social phobia. Available data suggest that clinically anxious children may have a poor meta-cognitive understanding of emotion compared to their nonanxious peers (Southam-Gerow & Kendall, 2000). In particular, socially anxious children may possess difficulties understanding the linkages between cognition and emotion (Banjee & Henderson, 2001). Although this preliminary research awaits replication, potential deficits in emotional understanding may impact report of negative cognition. Specifically, based on such deficits, socially anxious youths may be more likely to report emotional responses when asked about their specific thoughts. Currently, however, it remains unclear how potential deficits in emotional understanding may affect socially phobic children's detection and report of their own thoughts.

In summary, important questions remain regarding cognitive factors associated with childhood social phobia. A better understanding of the role of cognition in the clinical presentation of social phobia among children and adolescents has the potential to inform both clinical and research efforts. To better understand these phenomena, this study compared the self-talk, expected performance, self-rated, and observer-rated performance of socially phobic and normal control children in relation to two social tasks. Additionally, based on the suggestion of several researchers (e.g., Alfano et al., 2002; Morris, Hirshfeld-Becker, Henin, & Storch, 2004) who have noted a general lack of attention toward developmental factors in the assessment of childhood anxiety, we categorized socially phobic youths into two groups: younger children (7 to 11 years) and adolescents (12–16 years).

## METHOD

### Subjects

The patient sample consisted of 50 children and adolescents referred for the treatment of social phobia at one of two sites: the Maryland Center for Anxiety Disorders (MCAD) at the University of Maryland in College Park, Maryland or Children's Hospital Medical

Center (CHMC) in Cincinnati, Ohio. Children were referred by school counselors, physicians, other professionals, or their parents responded to advertisements regarding free treatment for “shy” children. Parents and children were provided with detailed information regarding the treatment study, including the behavioral assessment tasks, and signed consent/assent forms prior to their participation. Mean age for all socially phobic youths was 11.94 years ( $SD = 2.65$ ), with an age range of 7–16 years. Twenty-eight subjects (56%) were male. There were 39 (78%) Caucasian children, 9 (18%) African-American children, 1 (2%) Hispanic child, and 1 (2%) Asian-American child in the patient sample (see Table I). All children were of normal intelligence as assessed by the Vocabulary and Block Design subtests of the WISC-III and based on their enrollment in regular classroom settings.

The control sample consisted of 30 children and adolescents recruited at MCAD as role-play confederates and/or “peer-helpers” for the same treatment program. All normal control children were recruited through the use of community flyers or local advertisements for “friendly” children/adolescents. Similar to the socially phobic group, consent/assent was obtained from control children and their parents prior to participation in the study. Normal control children first participated as a subject in the current study before serving as a confederate or peer-helper. Mean age for all control subjects was 11.87 ( $SD = 2.16$ ) years (range 7–16 years), and 17 (57%) children were female. There were 15 (50%) Caucasian children and 15 (50%) African-American children in the

control sample. Of note, although control children were recruited as peer-helpers for a treatment study, this role required only that children assist with the behavioral assessment (described below) and participate in group social activities with other children. Control children were not required to give performances in front of their peers or demonstrate any specific types of social skill. Accordingly, examination of control children’s scores on a validated measure of childhood social anxiety (SPAIC; Beidel, Turner, & Morris, 1995) indicated social fears considered to be the normative range ( $M = 7.9$ ,  $SD = 7.6$ ; see Beidel et al., 1995). As such, rather than representing a “supernormal” subsample of normal children, control children reported age-appropriate amounts of social anxiety.

For analyses based on age, children under the age of 12 and adolescents 12 years and older comprised two separate groups. For the 32 young children in the study, the mean age was 9.3 years ( $SD = 1.26$ ) and for 48 adolescents, the mean age was 13.6 years ( $SD = 1.28$ ). No differences in mean ages between socially phobic youths and normal control children were found.

## Assessment

### Diagnostic Interview

All children (as well as their parents) were interviewed by a licensed clinical psychologist, a postdoctoral fellow in clinical psychology or an advanced doctoral student in clinical psychology using the Anxiety Disorders Interview Schedule for Children for DSM-IV (ADIS-C; Silverman & Albano, 1996). The same clinician interviewed the parent (first) and the child (second). For the current investigation, diagnoses were based on information provided by the child and the parent during separate interviews. Twenty-five percent of interviews were videotaped and rated by a second clinician blind to diagnostic status. The resulting kappa coefficient for the diagnosis of social phobia was 0.85. All socially phobic children met criteria for a primary AXIS I diagnosis of social phobia. Also, 28 (56%) socially phobic youths met criteria for at least 1 secondary AXIS I diagnosis. Comorbid diagnoses included generalized anxiety disorder ( $n = 8$ ), specific phobia ( $n = 8$ ), separation anxiety disorder ( $n = 5$ ), attention deficit hyperactivity disorder ( $n = 4$ ), dysthymia ( $n = 4$ ), selective mutism ( $n = 4$ ), oppositional defiant disorder ( $n = 1$ ), and depression ( $n = 1$ ). Anxious children were excluded from participating if they met criteria for a psychotic disorder, bipolar illness, or severe depression. Children in the control group

**Table I.** Demographic Characteristics

	MCAD <i>n</i> (%)	CHMC <i>n</i> (%)	TL Soc Phob <i>n</i> (%)	Control <i>n</i> (%)
Gender				
Female	12 (43)	10 (46)	22 (44)	17 (57)
Age				
Under 12	11 (39)	10 (45)	21 (42)	11 (37)
M ( <i>SD</i> )	9.5 (1.1)	8.9 (1.2)	9.2 (1.2)	9.5 (1.3)
12 & older	17 (61)	12 (55)	29 (58)	19 (63)
M ( <i>SD</i> )	13.8 (1.5)	14.0 (.95)	13.9 (1.3)	13.2 (1.1)
Ethnicity				
Caucasian	17 (61)	22 (100)	39 (78)	15 (50)
African-American	9 (32)	0	9 (18)	15 (50)
Hispanic	1 (4)	0	1 (2)	0
Asian-American	1 (4)	0	1 (2)	0

*Note.* MCAD = Maryland Center for Anxiety Disorders; CHMC: Children’s Hospital Medical Center; TL Soc Phob: socially phobic youths across both sites.

did not meet diagnostic criteria for any lifetime AXIS I disorder.

### *Self-Report*

All children completed the Social Phobia and Anxiety Inventory for Children (SPAIC; Beidel et al., 1995). The SPAIC assesses a range of potentially fearful social situations, including physiological and behavioral reactions, and is a reliable measure of childhood social phobia (Beidel, Turner, Hamlin, & Morris, 2000; Morris & Masia, 1998). Additionally, the SPAIC contains seven items aimed at measuring dysfunction/negative cognitions (self-talk). For example, "When I am with other people . . . I think . . . whatever I say will sound stupid." Although not specifically validated separate from the inventory itself, we examined children's self-report on these items in addition to examining the SPAIC total score. Internal consistency (coefficient alpha) for this sample was  $\alpha = .92$  for total SPAIC scores and  $\alpha = .89$  for the SPAIC cognitive items.

## **Procedure**

### *Behavioral Assessment*

Social skill and anxiety were evaluated during two tasks. Children were told that the purpose of these tasks was to examine how children interact with other children. Order of task presentation was randomized for all subjects and children were informed that they could discontinue the tasks at any time. Normal controls participated first as subjects, prior to any participation as a peer. For the social interaction task, five role-play scenes requiring interaction with a peer assessed children's ability to (1) carry on a conversation, (2) give a compliment, (3) graciously receive another child's offer for help, (4) receive a compliment, and (5) request that another child change their negative behavior. The confederate was a peer of the same age and gender. Peer-helpers were prompted to direct two separate statements toward socially phobic youths (using standardized cue cards). Subjects were instructed to respond to the peer as they would if they were actually in that situation (i.e., including instances where they would not respond to their peer). The performance task required children to read aloud an age-appropriate story (i.e., Jack and the Beanstalk for children under 12 years; The Ransom of Red Chief for adolescents 12 years and older) for 10 min in front of two individuals: the peer used for the role-play task and the adult assessor.

### *Video-Mediated Recall Procedure*

Following the two behavioral tasks and rating of anxiety and performance (see below), peers left the room while subjects viewed a videotape of him or herself engaged in the tasks. The videotape was stopped twice during each task at which point the children were asked to retrospectively recall their thoughts (self-talk). Specific stop points were chosen arbitrarily but allowed for children to view an ample portion of each task prior to recalling their specific thoughts. For the current investigation, a videotape shot from the child's perspective was used based on previous research that this perspective assists children in retrospectively recalling their thoughts (Lodge, Tripp, & Harte, 2000).

### *Self-Rated Expectation/Performance*

Immediately prior to each behavioral task (but following task directions), all children completed a four-item questionnaire regarding their performance expectations including (1) overall performance on the tasks, (2) ability to hide their anxiety, (3) use of task-specific skills, and (4) peer's evaluation of their performance. Each question was rated on a 4-point likert-type scale where 1 = poorly, 2 = somewhat poorly, 3 = somewhat well, and 4 = well. Thus, for each task a maximum total score of 16 was possible. For the role-play task, the expectation questionnaire was administered following a practice scene to ensure that the children understood the task's requirements. Immediately following both tasks, children were asked to complete a similar four-item questionnaire regarding how well they thought they actually performed on the previous task. Items on the performance questionnaires matched items on the expectation questionnaires but were worded in the past tense. Although peers were present when questionnaires were completed, they were unable to see the children's ratings. Coefficient alphas for the four performance measures were as follows: role-play expectancy,  $\alpha = .89$ , read-aloud expectancy,  $\alpha = .84$ , read-aloud performance,  $\alpha = .91$ , and read-aloud performance,  $\alpha = .87$ .

### *Self-Rated Anxiety*

Following each task, children were asked to rate their anxiety while engaged in the actual task. A 5-point likert-type scale was used, with 1 reflecting very little to no anxiety and 5 reflecting extreme anxiety. The scale used pictorial representations of anxiety levels to assist children in anchoring their feelings. Similar to rating of

expectation/performance, anxiety ratings were kept hidden from peers.

*Observer-Rated Anxiety/Performance*

All behavioral tasks were videotaped and later rated by independent raters blind to diagnostic status. Independent raters used 4-point likert-type scales and rated anxiety (1 = extremely anxious to 4 = not at all anxious) and performance (1 = not at all effective to 4 = very effective) for the two tasks. In addition, observers rated facial gaze (i.e., appropriate eye contact) and speech latencies during the role-play task. All raters were trained prior to rating videotapes. Twenty-five percent of the videotapes were rated independently by a second rater to ensure interrater reliability. Respectively for the role-play and read-aloud tasks, interrater reliability (kappa) was 0.88/0.85 for anxiety and 0.82/0.84 for performance. For specific social skills, interrater reliability was 0.92 for facial gaze and 0.95 for speech latency.

*Coding of Self-Talk*

During the video-mediated recall procedure, the children’s self-talk (thoughts) was recorded verbatim. For younger children (under 12 years), a form consisting of a cartoon scene resembling the actual assessment was used to record actual self-talk and children were told that the assessor would be writing down their thoughts in the empty “thought bubbles.” Independent judges coded each thought into 1 of 10 categories (see Table II for category descriptions). Thoughts were coded based on both their valence (negative vs. positive vs. neutral) and their content (performance vs. task vs. emotion). Additionally, thoughts were coded as “Other” if they did not fit into any of the above categories. Twenty-five percent of all cases were rated independently by a second rater to determine interrater reliability.

**RESULTS**

**Site Differences**

Chi-square and *t*-tests revealed no site differences between socially phobic children with the exception of ethnicity. Specifically, there was a significantly higher percentage of African-American children among the socially phobic group presenting to MCAD compared to CHMC [ $\chi^2(1, N = 50) = 11.08, p < .05$ ]. However, follow-up

**Table II.** Original Cognition Categories

(1) Negative performance	Thoughts specifically related to the child’s performance that are negative in nature. Example: (“I can’t do this.”)
(2) Neutral performance	Thoughts specifically related to the child’s performance that are neither positive nor negative. (Example: “How do you pronounce this word?”)
(3) Positive performance	Thoughts specifically related to the child’s performance that are positive in nature. (Example: “I am a good reader.”)
(4) Negative task	Thoughts specifically related to the task that are negative in nature. (Example: “This is boring and I don’t want to do this anymore.”)
(5) Neutral task	Thoughts specifically related to the task that are neither positive nor negative. (Example: “Something like that happened to me once.”)
(6) Positive task	Thoughts specifically related to the task that are positive in nature. (Examples: “I like this story.”)
(7) Negative emotion	A feeling or emotion (rather than a thought) that is specifically negative in nature. (Example “I feel nervous.”)
(8) Neutral emotion	A feeling or emotion (rather than a thought) that is neutral in nature. (Example: “I feel tired/hungry.”)
(9) Positive emotion	A feeling or emotion (rather than a thought) that is positive in nature. (Example: “I feel happy.”)
(10) Other	Thoughts that are unrelated to the child’s performance or the task and do not express an emotion/feeling. (Example: “I will have pizza later.”)

ANOVAs examining anxiety, expectation of performance, performance ratings and total thoughts (self-talk) did not reveal any site differences. Therefore, socially phobic children from both clinic sites were combined to represent one group.

**Demographics**

There were no significant group differences based on age or gender. There was a significant difference between the socially phobic (SOC) and normal control (NOR)

groups in terms of ethnicity [ $\chi^2(1, N = 80) = 9.78, p < .05$ ], with more African-American children in the control group. Although there is no obvious reason to assume a meaningful relationship between cognitive factors related to social anxiety and ethnicity, a follow-up  $2 \times 2$  (group  $\times$  ethnicity) MANOVA across all dependent measures did not reveal any significant group differences. Thus, race was not included as a covariate for final analyses.

## Self-Report

### Anxiety

A  $2 \times 2$  (group  $\times$  age) MANOVA was conducted for all dependent anxiety measures (SPAIC, cognitive items on the SPAIC, anxiety rating on the role-play task, and anxiety rating on the read-aloud task). The overall  $F$  was significant [ $F(1, 79) = 16.16, p < .001$ ]. Follow-up univariate ANOVAs revealed that socially phobic youths scored significantly higher on the SPAIC [ $F(1, 79) = 4.07, p < .001$ ], role-play ratings of anxiety [ $F(1, 79) = 33.55, p < .001$ ], and read-aloud ratings of anxiety [ $F(1, 79) = 9.79, p < .01$ ] compared to control children. No significant main effects emerged for age. However, a significant group  $\times$  age interaction was detected for the cognitive items on the SPAIC [ $F(1, 79) = 6.29, p < .05$ ]. In order to better understand the specific nature of this difference, data for socially phobic children and adolescents and control children and adolescents were recoded into four separate groups (socially phobic children, socially phobic adolescents, control children, and control adolescents). An ANOVA and follow-up Tukey's test revealed that both socially phobic adolescents ( $M = 6.6$ ) and socially phobic younger children ( $M = 4.6$ ) scored higher on these items than control adolescents ( $M = 1.2$ ).

### Expectation of Performance

A  $2 \times 2$  (group  $\times$  age) MANOVA examining scores on the role-play expectation questionnaire revealed that socially phobic youths expected to perform less well than the control group on the role-play task [ $F(1, 79) = 4.05, p < .01$ ; see Table III]. Follow-up univariate ANOVAs revealed that compared to the control children, socially phobic youths believed they would be less able to hide their anxiety [ $F(1, 79) = 7.07, p < .01$ ] and that the peer would judge their performance to be worse [ $F(1, 79) = 9.65, p < .01$ ]. There was no significant main effect for age. However, there was a significant group  $\times$

**Table III.** Mean Scores and Standard Deviations for Self-Report of Anxiety, Expectation, and Performance

	Soc Phob ( $n = 50$ ) $M$ ( $SD$ )	Control ( $n = 30$ ) $M$ ( $SD$ )
SPAIC		
Under 12	23.3 (9.7)	10.5 (9.3)
12 & over	26.6 (12.6)	6.3 (5.9)
Total	25.2 (11.5)	7.94 (7.5)**
Role-play task		
Expectation		
Under 12	11.57 (2.8)	12.82 (4.0)
12 & over	10.68 (2.7)	14.63 (2.0)
Total	11.06 (2.8)	13.97 (3.0)*
Performance		
Under 12	10.95 (4.1)	12.55 (3.9)
12 & over	10.55 (3.1)	14.68 (1.7)
Total	10.72 (3.5)	13.90 (2.9)**
Read-aloud task		
Expectation		
Under 12	11.67 (3.3)	12.55 (4.9)
12 & over	11.79 (2.1)	14.32 (2.1)
Total	11.74 (2.6)	13.67 (3.2)
Performance		
Under 12	11.65 (3.2)	12.27 (3.1)
12 & over	10.79 (2.6)	12.89 (3.3)
Total	11.14 (2.9)	12.67 (3.2)

\* $p < .01$ ; \*\* $p < .00$ .

age interaction for children's expectation regarding their ability to "think of things to say" to the peer during the role-plays [ $F(1, 79) = 4.65, p < .05$ ]. A follow-up ANOVA and Tukey's test examining scores across all four groups revealed that socially phobic adolescents ( $M = 2.4$ ) expected to perform worse than control adolescents ( $M = 3.6$ ) on this particular aspect of the task.

A  $2 \times 2$  (group  $\times$  age) MANOVA examining scores on the read-aloud expectation questionnaire revealed that overall, socially phobic children did not expect to perform less well than the control group on this task [ $F(1, 79) = 2.24, p = .07$ ]. No significant main effect for age or group  $\times$  age interactions was found.

### Performance

Results of a  $2 \times 2$  (group  $\times$  age) MANOVA examining scores on the role-play performance questionnaire revealed that socially phobic youths believed that they performed less well than the control group [ $F(1, 79) = 5.55, p < .001$ ]. Follow-up univariate ANOVAs revealed that compared to control children, socially phobic youths believed that they were less able to hide their anxiety [ $F(1, 79) = 19.09, p < .001$ ] and that the peer judged their performance to be worse [ $F(1, 79) = 4.07, p < .05$ ].

No significant main effect emerged for age. However, a significant group  $\times$  age interaction was found regarding children's self-rated ability to generate conversation topics during the role-plays [ $F(1, 79) = 5.06, p < .05$ ]. A follow-up Tukey's test revealed that both younger socially phobic children ( $M = 2.6$ ) and socially phobic adolescents ( $M = 2.3$ ) believed that they were less able to think of things to say than control adolescents ( $M = 3.6$ ).

A  $2 \times 2$  (group  $\times$  age) MANOVA examining scores on the read-aloud performance questionnaire revealed that overall, socially phobic youths did not differ from control children in terms of their ratings of their performance on this task. No significant main effect for age or group  $\times$  age interactions was found.

#### *Expectation Versus Perceived Performance*

A  $2 \times 2 \times 2$  (evaluation period  $\times$  group  $\times$  age) repeated measures MANOVA was conducted using total expectation and performance scores across both tasks to examine changes in self-ratings from pre- to post-task. Interestingly, all children (i.e., both the socially phobic and control groups) rated their actual performance to be poorer than their initial expectations on the read-aloud task [ $F(1, 79) = 5.37, p < .05$ ]. On the role-play task, however, when compared to the control group ( $M_{exp} = 14.0, M_{perf} = 13.9$ ), only socially phobic youths ( $M_{exp} = 11.1, M_{perf} = 10.7$ ) believed that they had performed less well compared to their initial expectation of their performance [ $F(1, 79) = 6.55, p < .05$ ]. No significant main effect for age or interaction terms emerged.

### **Independent Observer-Ratings**

#### *Anxiety*

Results of a  $2 \times 2$  (group  $\times$  age) ANOVA examining observer-rated anxiety during the role-play task revealed that socially phobic youths exhibited significantly higher levels of anxiety than control children [ $F(1, 79) = 34.54, p < .001$ ]. There was neither a main effect for age nor for the interaction term. A similar ANOVA examining observer-rated anxiety during the read-aloud task also revealed that the socially phobic youths exhibited significantly higher levels of anxiety during the task than control children [ $F(1, 79) = 12.72, p < .001$ ]. Again, no significant main effect for age or interaction terms emerged.

#### *Performance*

Two separate  $2 \times 2$  (group  $\times$  age) ANOVAs were used to examine overall observer-rated performance during the two tasks. For the role-play task, socially phobic youths were judged to be less socially effective than the control group of children [ $F(1, 79) = 66.68, p < .001$ ]. Similar results emerged for the read-aloud task, where reading performance among socially phobic youths was rated as less effective than the control children [ $F(1, 79) = 18.05, p < .01$ ]. For both tasks, no significant main effect for age or interaction terms emerged. For facial gaze, there were no main effects for group or age. For speech latencies, main effects for both group [ $F(1, 79) = 28.82, p < .001$ ] and age [ $F(1, 79) = 4.16, p < .05$ ] were detected. Compared to the control group, socially phobic youths had significantly longer speech latencies during the role-play task. In terms of age, younger children had significantly longer speech latencies during the role-play task compared to adolescents aged 12 and older. Results of this ANOVA also revealed a significant group  $\times$  age interaction. A follow-up of Tukey's test revealed that socially phobic children required a significantly longer period of time to respond to the peer than the other three groups, including socially phobic adolescents, control children, and control adolescents. Means and standard deviations for all observer-rated measures across groups are presented in Table IV.

### **Self-Talk**

#### *Data Reduction*

Few or no children reported thoughts coded as positive performance, positive task, positive emotion, neutral emotion, or other thoughts. Thus, to increase statistical power for subsequent analyses, these categories were deleted, resulting in a total of five self-talk categories (including negative performance thoughts, neutral performance thoughts, negative task thoughts, neutral task thoughts, and negative emotions). Means and standard deviations for each category are provided in Table V. Interrater reliability (kappa coefficients) was as follows: negative performance = 0.91, neutral performance = 0.87, negative task = 0.80, neutral task = 0.98, and negative emotions = 0.95.

#### *Video-Mediated Recall of Self-Talk*

A  $2 \times 2$  (group  $\times$  age) ANOVA conducted for total number of thoughts across the two tasks revealed no main

**Table IV.** Mean Scores and Standard Deviations for Observer Ratings of Anxiety, Effectiveness, and Social Skill

	Soc Phob ( <i>n</i> = 50) <i>M</i> ( <i>SD</i> )	Control ( <i>n</i> = 30) <i>M</i> ( <i>SD</i> )
Role-play task		
Anxiety		
Under 12	2.8 (0.75)	1.7 (0.42)
12 & over	2.4 (0.85)	1.6 (0.34)
Total	2.6 (0.82)	1.6 (0.37)**
Effectiveness		
Under 12	1.8 (0.72)	3.3 (0.26)
12 & over	2.3 (0.77)	3.4 (0.59)
Total	2.1 (0.78)	3.4 (0.49)**
Speech latency		
Under 12	4.4 (2.9)	0.74 (0.68)
12 & over	2.2 (1.7)	1.0 (1.0)
Total	3.2 (2.5)	0.94 (0.93)**
Facial gaze		
Under 12	0.33 (0.39)	0.46 (0.33)
12 & over	0.38 (0.39)	0.49 (0.37)
Total	0.36 (0.39)	0.48 (0.35)
Read-aloud task		
Anxiety		
Under 12	2.2 (1.0)	1.5 (0.41)
12 & over	1.9 (0.50)	1.4 (0.56)
Total	2.0 (0.76)	1.5 (0.50)**
Effectiveness		
Under 12	2.3 (0.88)	3.2 (0.37)
12 & over	2.6 (0.74)	3.2 (0.68)
Total	2.5 (0.81)	3.2 (0.58)**

\* $p < .01$ ; \*\* $p < .00$ .

effect for group. However, there was a main effect for age. Adolescents reported significantly higher frequencies of self-talk ( $M = 5.5$ ) than young children [ $M = 3.8$ ;  $F(1, 79) = 5.03, p < .05$ ]. To control for the effect that overall frequency of thoughts may exert on the specific types of thoughts reported, number of thoughts was entered as a covariate for all subsequent analyses.

#### Role-Play Task

A  $2 \times 2$  (group  $\times$  age) multivariate analysis of covariance (MANCOVA) for thoughts during the role-play task revealed a significant main effect for group [ $F(1, 79) = 2.29, p < .05$ ]. Specifically, socially phobic youths ( $M = 0.26$ ) reported a greater number of negative performance thoughts than the control group [ $M = 0.03$ ;  $F(1, 79) = 4.42, p < .05$ ]. In contrast, control children ( $M = 1.4$ ) reported a greater number of neutral task thoughts than the socially phobic group [ $M = .74$ ;  $F(1, 79) = 10.12, p < .01$ ]. A significant main

**Table V.** Mean Scores and Standard Deviations for Cognition Categories Based on Group and Age

	Soc Phob ( <i>n</i> = 50) <i>M</i> ( <i>SD</i> )	Control ( <i>n</i> = 30) <i>M</i> ( <i>SD</i> )
Negative performance		
Under 12	0.00 (0.30)	0.00 (0.00)
12 & over	0.38 (0.68)	0.00 (0.23)
Neutral performance		
Under 12	0.48 (0.75)	0.55 (0.82)
12 & over	0.48 (0.83)	0.11 (0.32)
Negative task		
Under 12	0.00 (0.22)	0.00 (0.00)
12 & over	0.28 (0.88)	0.16 (0.50)
Neutral task		
Under 12	0.29 (0.56)	1.09 (1.04)
12 & over	1.07 (1.10)	1.63 (1.01)
Negative emotion		
Under 12	0.62 (0.97)	0.27 (0.65)
12 & over	0.14 (0.44)	0.00 (0.23)
Read-aloud task		
Negative performance		
Under 12	0.33 (0.66)	0.73 (0.79)
12 & over	0.79 (0.98)	0.74 (1.05)
Neutral performance		
Under 12	0.48 (0.81)	0.00 (0.30)
12 & over	0.52 (0.83)	0.47 (0.61)
Negative task		
Under 12	0.24 (0.62)	0.00 (0.00)
12 & over	0.52 (0.87)	0.37 (0.76)
Neutral task		
Under 12	0.38 (0.74)	0.55 (0.93)
12 & over	0.72 (1.03)	0.68 (0.89)
Negative emotion		
Under 12	0.38 (0.97)	0.73 (1.01)
12 & over	0.38 (0.73)	0.26 (0.56)

effect was also detected for age [ $F(1, 79) = 3.27, p < .05$ ]. Univariate tests revealed that younger children ( $M = 0.50$ ) (regardless of group) reported a greater number of negative emotions than adolescents [ $M = 0.10$ ;  $F(1, 79) = 8.94, p < .01$ ]. Additionally, adolescents ( $M = 1.29$ ) reported a greater number of neutral task thoughts compared to younger children [ $M = 0.56$ ;  $F(1, 79) = 4.36, p < 0.05$ ]. No significant interaction terms were found for types of cognitions reported during the role-play task.

#### Read-Aloud Task

A similar MANCOVA for thoughts reported during the read-aloud task did not reveal significant main effects for either group or age. Further, no significant group  $\times$  age interactions were found.

**Table VI.** Partial Correlations for Cognition Types Controlling for Number of Total Thoughts ( $N = 80$ )

	RPneg	RPneg	RPneut	RPneut	RPemot	RPemot	RPexp	RPperf	RDexp	RPperf	RPanx	RDanx	ADISsev
RPneg													
RDneg	0.30*												
RPneut	-0.39**	-0.15											
Rdneut	-0.23*	-0.37**	0.47**										
Rpemot	-0.08	-0.08	-0.37**	-0.14									
Rdemot	-0.14	0.01	-0.33*	-0.41**	0.38**								
Rpexp	-0.22	-0.21	0.11	0.09	0.08	-0.01							
Rpperf	-0.11	-0.18	0.08	0.09	0.1	0.00	0.82**						
Rdexp	-0.14	-0.14	0.07	0.00	0.08	-0.08	0.65**	0.62**					
RDperf	0.16	-0.33*	-0.01	0.09	0.15	-0.03	0.67**	0.70**	0.60**				
Rpanx	0.25*	0.11	-0.25*	-0.20	0.16	0.09	-0.58**	-0.63**	-0.29*	-0.42**			
Rdanx	0.22	0.15	-0.07	0.01	-0.03	0.14	-0.54**	-0.49**	-0.47**	-0.58**	0.64**		
ADISsev	0.20	0.11	-0.14	-0.11	-0.08	0.24	-0.14	-0.13	0.04	-0.10	0.07	0.13	

Note. RPneg = negative performance thoughts during the role-play; RDneg: negative performance thoughts during the read-aloud; RPneut: neutral task thoughts during the role-play; RDneut: neutral task thoughts during the read-aloud; RPemot: negative emotions during the role-play; RDemot: negative emotions during the read-aloud; RPexp: total expectation score on the role-play; Rpperf: total performance score on the role-play; RDexp: total expectation score on the read-aloud; RDperf: total performance score on the read-loud; Rpanx: role-play anxiety rating; Rdanx: read-aloud anxiety rating; ADISsev: ADIS-C social phobia clinical severity rating ( $n = 50$ )

\* $p < .05$ . \*\* $p < .001$

*Correlations Between Self-Talk and Self-Rated Performance*

Partial correlations controlling for total number of thoughts ( $n = 80$ ) revealed a moderate and significant negative correlation between negative performance thoughts during the read-aloud task and self-rated perceptions of their performance during the task ( $r = -.33, p < .05$ ). Role-play performance self-ratings were not significantly correlated with any specific type of cognition/emotion reported by children during the role-play task. Additionally, neutral task thoughts reported during the read-aloud task were significantly negatively correlated with both negative performance thoughts ( $r = -.37, p < .001$ ) and negative emotions ( $r = -.41, p < .001$ ) during the same task. Similar significant negative correlations were found for neutral task thoughts reported during the role-play task and both negative performance thoughts ( $r = -.39, p < .001$ ) and negative emotions ( $r = -.37, p < .001$ ). See Table VI for correlation matrix.

*Correlations Across All Variables*

Table VII depicts the correlations across demographic and dependent variables included in the current study. As expected, there were significant relationships between social phobia severity (as measured by the SPAIC) and most cognitive measures including children’s expecta-

tions and their perceived performance on both behavioral tasks.

**DISCUSSION**

This study examined the relationship between different cognitive phenomena and childhood social phobia. The results of this investigation indicate that in anticipation of and following a social interaction, children and adolescents with social phobia were more likely to expect to perform poorly and to evaluate their performance as inferior to those of peers with no psychiatric disorder. Interestingly, although their evaluations were more negative, they were nonetheless accurate, as independent evaluators, blinded to group assignment, rated the youths with social phobia as significantly less skilled than their normal control counterparts. However, only socially phobic adolescents reported the presence of negative self-talk during a social interaction and even among this subgroup, only 20% of adolescents reported the presence of such self-talk.

The results are consistent with previous reports but raise interesting questions about the role of cognition, and especially self-talk, in the presentation of the disorder among youths. First, and consistent with others (Spence et al., 1999; Chansky & Kendall, 1997), the results indicated that socially phobic youths reported significantly greater self-talk (more negative performance thoughts) during a social interaction. However, the clinical

Table VII. Bivariate Correlations ( $N = 80$ )

	Age	Gender	SPAIC	cogSPAIC	RPanx	RDanx	ObsRPanx	obsRDanx	obsRPeff	obsRDDef	RPexp	RDexp	RPperf	RDperf	RPneg	RDneg
Age	-0.05															
Gender	0.02	0.00														
SPAIC	0.03	-0.03	0.82**													
cogSPAIC	-0.04	-0.09	0.56**	0.44**												
RPanx	0.00	-0.03	0.45**	0.32**	0.64**											
RDanx	-0.08	0.06	0.30**	0.08	0.42**	0.24*										
obsRPanx	-0.09	0.11	0.13	-0.06	0.28*	0.35**	0.54**									
obsRDanx	0.18	-0.04	-0.44**	-0.20	-0.44**	-0.28*	-0.64**	-0.52**								
obsRPeff	0.18	-0.23*	-0.30**	-0.07	-0.31**	-0.31**	-0.32**	-0.55**	0.62**							
obsRDDef	0.01	-0.08	-0.54**	-0.37**	-0.58**	-0.58**	-0.32**	-23*	0.39**	0.32**						
RPexp	0.11	-0.19	-0.43**	-0.26**	-0.51**	-0.51**	-0.29**	-0.33**	0.35**	0.35**	0.67**					
RDexp	0.05	-0.05	-0.51**	-0.31**	-0.51**	-0.51**	-0.42**	-0.31**	0.50**	0.34**	0.82**	0.64**				
RPperf	-0.06	-0.09	-0.27*	-0.17	-0.59**	-0.59**	-0.20	-0.23**	0.23*	0.26*	0.66**	0.61**	0.70**			
RDperf	0.13	0.10	0.24*	0.28*	0.25*	0.25*	-0.13	-0.01	0.04	-0.03	-0.24*	-0.13	-0.11	-0.20		
RPneg	0.15	-0.13	0.01	0.13	0.21	0.21	-0.15	-0.16	0.24**	0.25*	-0.24*	-0.12	-0.16	-0.34**	0.41**	
RDneg																

Note. cogSPAIC = SPAIC score for cognitive items; RPanx: role-play anxiety rating, RDanx: read-aloud anxiety rating; obsRPanx: observer-rated anxiety on the role-play; obsRDanx: observer-rated anxiety on the read-aloud; obsRPeff: observer-rated effectiveness on the role-play; obsRDDef: observer-rated effectiveness on the read-aloud; RPexp: total expectation score on the role-play; RDexp: total expectation score on the read-aloud; RPperf: total performance score on the role-play; RDperf: total performance score on the read-aloud; RPneg: negative performance thoughts during the read-aloud; RDneg: negative performance thoughts during the read-aloud.  
 \* $p < .05$ . \*\* $p < .001$ .

significance of this finding is unclear as the mean number of negative performance thoughts reported by the anxious group was approximately one quarter of one thought per subject. In fact, only 20% of the socially phobic youths reported the presence of any negative performance self-talk and all negative thoughts were reported by adolescents. The fact that negative performance thoughts were infrequently reported by socially phobic adolescents and were generally absent among young socially phobic children has implications for both childhood models of the disorder and its treatment. We discuss these implications below.

The presence of negative self-thoughts only among adolescents with social phobia highlights the importance of considering developmental factors in the assessment of cognition. For example, one fundamental question addressed in the current study is whether younger anxious children experience difficulty in differentiating self-talk (thoughts) from emotion, particularly during periods of increased anxiety. However, the current results do not support the hypothesis that confusing thoughts with emotional responses is specific to socially phobic youths. Rather, younger children, regardless of diagnostic status, more commonly reported emotions when questioned about their self-talk, likely reflecting a developmentally appropriate deficit in meta-cognitive skill. Although these results provide support for the use of developmentally sensitive methods of assessment among children, further research examining discrete domains of emotional understanding (as in Banjeree & Henderson, 2001) is needed.

The lack of negative performance thoughts reported by young children with social phobia raises important conceptual questions with regard to how negative self-talk relates to the etiology of this disorder. Although 20% of adolescents with social phobia reported negative performance thoughts during the role-play task, their absence among the other 80% of socially phobic adolescents (and all young children with social phobia) suggests that negative self-thoughts may be a potential epiphenomenon or consequence of the disorder rather than a specific causal factor. One possible explanation for their presence among only 20% of adolescents may be the inherently variable range of social experiences during this period. More specifically, negative self-thoughts may be more likely to develop following a multitude of previous social interactions where the adolescent perceives their performance as less than adequate. Over time, a growing number of (negative) social experiences may create an emotional state in which negative self-talk is most likely to emerge, resulting in their presentation among some adolescents and many adults with this disorder.

Of course, alternative explanations also exist. First, the presence of negative self-talk may be related to symptom severity. Specifically, a more severe form of the disorder among adolescents may directly moderate the relationship between such thoughts and level of development. However, there were no differences in negative thoughts based on age group (children vs. adolescents). Further evaluations of this relationship should use a broader age range and determine the relations between anxious severity and negative thoughts as a function of age. Another possibility is that the presence and severity of negative self-talk may directly relate to the assessment method used in the current study. As reviewed previously by the current authors (Alfano et al., 2002), different methods of assessment have produced somewhat variable frequencies of self-talk. Although a video-mediated recall procedure was selected based on previous research (Lodge et al., 2000; Spence et al., 1999), other methods might have yielded different results. Further, because video stop points were chosen arbitrarily, it is not clear whether allowing children to view longer (or shorter) segments of their performance might produce dissimilar rates of self-talk.

Another possible explanation is that young socially phobic children may have had difficulty articulating negative self-talk related to their performance on the role-play task (i.e., despite their presence), perhaps highlighting basic developmental limitations in meta-cognitive skill. In fact, some of the self-talk may have actually been expressed as negative emotions. Although this remains a possibility, it should be noted that many younger children (both socially phobic and controls) reported at least one negative performance thought during the read-aloud task. Thus, because they were able to report the presence of negative self-talk during the read-aloud task, it appears unlikely that their absence during the social interaction task resulted from limited meta-cognitive skill. Alternatively, the greater complexity of the social interaction task (i.e., requiring flexible attention and greater cognitive resources) as compared to the read-aloud task may explain these differences in self-talk. Although completely untangling these alternative hypotheses are beyond the scope of this investigation, overall, the current data suggest that developmental differences in negative self-talk cannot be attributed to differences in levels of anxiety or meta-cognitive skill.

In contrast to the data for self-talk, decreased expectation of social performance appears more consistently in the disorder's clinical presentation. Regardless of age, socially phobic youths had significantly lower expectations of their performance during the social interaction task and rated their performance to be worse than their peers. These negative expectations and lower performance

ratings were confirmed by blinded independent observers, who rated socially phobic youths as less skilled during the social interaction task compared to their nonanxious peers. Interestingly, with regard to the specific ability to generate conversation topics, only socially phobic adolescents expected to perform worse than controls. Despite the fact that they later rated their actual ability to “think of things to say” similarly (i.e., poorly) to their adolescent counterparts, younger socially phobic children did not differ from controls on this measure of expectation. This finding is particularly surprising considering the fact that blinded observers judged socially phobic children to exhibit the longest speech latencies compared to the other three groups. Again, a mounting number of negative social experiences may have played a role in directly shaping adolescents’ expectations of this specific skill. Although all youths with social phobia may worry about their ability to generate conversation, expectations of decreased performance may become exaggerated and more specific over time, even in the presence of increased social skill. Such preemptive negative thoughts and expectations likely assist in maintaining anxious symptoms and behavioral avoidance over time.

Despite the fact that blinded observers rated the reading performance of socially phobic youths to be poorer than controls, no group differences for expectation, performance, or self-talk emerged. In fact, overall rates of self-talk differed considerably across the two tasks, with both the socially phobic and the control groups reporting significantly more negative self-talk during the read-aloud task. Additionally, a higher frequency of negative performance self-talk during the reading task was associated with lower self-ratings of performance, consistent with Spence et al. (1999). Although it might appear difficult to interpret these findings, it should be noted that the read-aloud task is conceptualized as an analogue public-speaking task for use with children. In this light, the lack of group differences and higher rate of negative performance self-talk, indicating greater concern about performance, is more understandable. Speaking in front of a group represents one of the most common fears reported by adolescents (Poulton et al., 1997), and it is likely that this task, which involved performance in front of a group, elicited some distress for all youths. In fact, while socially phobic youths reported similar levels of anxiety across both tasks, control children endorsed higher rates of anxiety for the reading task. Thus, for the current study, the social interaction task appeared to be a more effective discriminator of social phobia.

Several limitations of the current investigation should be noted. Specifically, in the absence of an adult comparison group, conclusions about the development of cogni-

tive aberrations over time are somewhat speculative. Additionally, for analyses based on both group and age, cell sizes in the current study were somewhat small, which inevitably resulted in a lack of statistical power. Future research utilizing larger samples of children and adolescents may reveal different findings. It should also be noted that since the current investigation was concerned with self-talk during actual anxiety-provoking situations, thoughts experienced prior to beginning the tasks were not assessed. Some previous research indicates an increase in negative self-talk during this period (Kendall & Chansky, 1991). Thus, examination of whether anticipatory self-talk may directly impact expectations of performance is needed. Finally, it will be important for future investigations to examine different diagnostic groups of anxious children to discern whether cognitive correlates vary in accordance with specific childhood anxiety diagnoses.

Overall, the current data indicate that negative self-talk during social interactions is uncommon among young children with social phobia, though they may be found among adolescents with this disorder. In contrast, negative beliefs regarding one’s ability to perform within social situations appear to be more consistently associated with social phobia in children of all ages. Although some researchers have suggested that such beliefs do not necessarily reflect realistic estimations of children’s social abilities (Cartwright-Hatton, Hodges, & Porter, 2003), findings from the current study do not support this thesis. Rather, consistent with their self-ratings of performance, socially phobic youths were judged by blinded observers to exhibit poorer performances than their nonanxious peers. This finding is consistent with other investigations where social skill deficits have been reported (Beidel et al., 1999; Ginsburg, LaGreca, & Silverman, 1998; Spence et al., 1999) and where significant improvements in overall functioning have resulted based on the inclusion of a social skills treatment component (Beidel, Turner, & Morris, 2000).

By comparison, the absence of negative self-talk among a majority of youths with social phobia appears to provide less support for treatment efforts attempting to eliminate or alter this aspect of negative cognition, although such interventions may be useful for those who do report their presence and perhaps may serve as a preventative strategy to prevent reoccurrence at a later date. In fact, rather than qualitative (i.e., positive vs. negative) thoughts regarding performance, data indicate that neutral on-task thoughts may be important markers of social anxiety and self-rated performance. For example, control children were most likely to report thoughts that were observational in nature (e.g., “I was thinking that if that

really happened, I would offer to help”), apparently indicating that these children were focused on the interaction itself. Together with a significant negative correlation for neutral task self-talk and anxiety during the interaction task, findings from the current study indicate that high levels of anxiety may directly interfere with children’s overall cognitive processing of social situations. However, because it remains unclear at the current time how self-talk may play a role in the onset and maintenance of social phobia in children and adolescents, future research based on the use of developmentally sensitive assessment methods is needed.

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