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The Development and Psychometric Properties of the Selective Mutism Questionnaire

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Research on selective mutism (SM) has been limited by the absence of standardized, psychometrically sound assessment measures. The purpose of our investigation was to present two studies that examined the factor structure and initial reliability and validity of the Selective Mutism Questionnaire (SMQ), a 17-item parent report measure of failure to speak related to SM. Study 1 ($N = 589$) utilized an Internet sample of parents of children ages 3 to 11 to demonstrate that the SMQ has a theoretically and clinically meaningful factor structure accounting for a significant portion of variance in responses with good internal consistency. Study 2 ($N = 66$) supported the validity of the SMQ in that scores discriminated clinic-referred children with SM from children with other anxiety disorders. Scores on the SMQ were correlated with measures of several theoretically and clinically important dimensions.

Selective mutism (SM) is a childhood behavioral disorder characterized by persistent failure to speak in specific social situations despite speaking in other situations. According to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed. [*DSM-IV*]; American Psychiatric Association, 1994), lack of speech

must cause interference, last at least 1 month, and must not be due to a lack of knowledge of the relevant language. SM is considered to be an impairing condition that interferes with both educational achievement and socialization (e.g., Bergman, Piacentini, & McCracken, 2002; Dummit et al., 1997). Although previously thought to be rare, a recent study found that 0.71% of Kindergarten through second-grade children in a large urban school district appeared to meet criteria for SM (Bergman et al., 2002). A similar study of somewhat younger children revealed a similar prevalence rate of 0.76% (Elizur & Perednik, 2003). Although SM has been the focus of greater attention recently, there is a relative lack of consensus on many issues related to the epidemiology, phenomenology, and treatment of the disorder.

One factor that hampers research related to SM is the lack of standardized measures that directly assess SM

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symptoms. Without access to such measures, researchers have attempted to assess SM-related behavioral problems without actually measuring the specific core symptoms of the disorder. For example, one recent study (Elizur & Peredik, 2003) used items from the Child Behavior Checklist (Achenbach, 1991) to measure symptoms thought to be associated with SM (e.g., worrying, doesn't get involved with others) but did not directly assess speaking behaviors. Other studies examining SM diagnoses (e.g., Vecchio & Kearney, 2005; Yeganeh, Beidel, Turner, Pina, & Silverman, 2003), phenomenology (e.g., Cunningham, McHolm, Boyle, & Patel, 2004; Dummit et al., 1997; Kristensen, 2001) and outcome (e.g., Remschmidt, Poller, Herpertz-Dahlmann, Hennighausen, & Gutenbrunner, 2001) similarly failed to include a standardized and well-validated measure of severity of the child's failure to speak. Of perhaps greater importance, treatment studies for SM have either failed to include psychometrically sound measures of speech failure or used nonstandardized measures complicating both comparisons of results across studies and replication efforts (Black & Uhde, 1994; Dummit, Klein, Tancer, Asche, & Martin, 1996).

Given the phenomenological overlap between SM and social anxiety, social anxiety measures (e.g., Social Anxiety Scale for Children-Revised [SASC-R; LaGreca & Stone, 1993], Social Phobia Anxiety Inventory for Children [Beidel, Turner, & Morris, 1995]), are relevant to the study of SM. However, standardized instruments assessing the core features of SM (e.g., failure to speak in certain situations) are clearly needed to better understand this disorder. The Selective Mutism Questionnaire (SMQ), a parent-report measure assessing the frequency of a child's speech across the functional domains of childhood was designed to address this need.

Several recent studies have demonstrated the initial utility of the SMQ in distinguishing children with SM from those with social phobia, other anxiety disorders, and/or normal controls (Bar-Haim et al., 2004; Chavira, Shipon-Blum, Hitchcock, Cohan, & Stein, in press; Manassis et al., 2003; Manassis et al., 2007). The SMQ was also utilized in a Web-based CBT program designed for the treatment of SM (Fung, Manassis, Kenny, & Fiksenbaum, 2002). This article describes the development and psychometric properties of the SMQ. Study 1 examined the factor structure and internal validity of the SMQ using data collected via the Internet from 589 parents visiting Web sites of two large SM-related organizations. Study 2 reports on a clinical sample of 48 children diagnosed with SM and 18 additional children who did not meet criteria for SM but were diagnosed with other *DSM-IV* (APA, 1994) anxiety disorders. The clinic-referred sample allowed for an evaluation of the construct validity, internal consistency, and treatment sensitivity of this measure.

STUDY 1

Method

Participants and Procedure

The initial respondents were 785 parents who identified their child as having difficulties speaking in some settings despite speaking normally in others. Parents completed the SMQ via the Internet over the course of a 1-year period. Parents also provided information regarding the current age, age of onset, date of onset, and gender of the child and responded to a screening question regarding the presence of speech at home. Web sites of two organizations that promote education, understanding, and research regarding SM (Selective Mutism Foundation, <http://www.selectivemutismfoundation.org>; Selective Mutism Group-Child Anxiety Network, <http://www.selectivemutism.org>) posted information regarding the SMQ and a link to an information page approved by the University of California-Los Angeles' Institutional Review Board and to the SMQ. In an effort to increase the likelihood that the children who were rated did, in fact, have SM, questionnaires that listed the age of the target child as younger than 3 years of age ($n = 6$) or older than 11 years of age ($n = 146$), or that were missing information regarding the child's speech at home ($n = 26$), were excluded from further analysis. As recommended by Kraut et al. (2004) in their report on Internet research methods, data from identical Internet protocol addresses ($n = 18$) were also excluded in an effort to eliminate duplicate responses. The final dataset consisted of data for 589 children.

The mean age of the 589 participants was 6.27 years ($SD = 2.05$), and the mean reported age of symptom onset was 3.06 years old ($SD = 1.1$). Sixty-eight percent of the sample was girls. Independent samples t tests revealed no significant differences in current age, $t(635) = 1.42$, $p = .15$, or age of onset, $t(631) = 32$, $p = .757$, between this group and the clinically diagnosed SM group participating in Study 2 (see the later section). Similarly, the results of a chi-square analysis did not reveal a significant difference in gender ratios from the Internet versus the clinically diagnosed group from Study 2, $\chi^2(1, N = 634) = .556$, $p = .52$. Almost half (47.3%) of parents reported that a psychologist or psychiatrist had previously diagnosed their child with SM.

Measures

SMQ. The SMQ was developed as a parent-report measure of a child's frequency of failure to speak across various settings. The initial item pool consisted of 18 behavior items developed in consultation with clinical psychologists experienced with the SM and parents of children with SM. Each item consists of a statement

regarding speaking behavior and four possible responses regarding how frequently the child speaks in that situation, ranging 0 (*never*), 1 (*seldom*), 2 (*often*), and 3 (*always*). Parents were instructed to rate verbalizations of average loudness. Lower scores on the SMQ reflect lower frequencies of speaking behavior.

Results

Exploratory Factor Analysis

A principal components analysis with Varimax rotation was conducted on the 18 SMQ items. Several criteria were used to examine the number of factors for further analysis including the eigenvalues greater than one rule, inspection of the scree plot, and parallel analysis. Although the principal components analysis and the parallel analysis initially suggested a four-factor solution, examination of the scree plot was more suggestive of a three-factor solution. Furthermore, the fourth factor contained four items, three of which also loaded on another factor making the fourth factor complex and difficult to interpret. In the interest of parsimoniously capturing the phenomenology of SM and maximizing the clinical utility of this instrument, only the first three factors were retained. Therefore, as recommended by several authors (e.g., Chaplin, 2005; Fabrigar, Wegener, MacCallum, & Strahan, 1999; Reise et al., 2000), factors were ultimately chosen based on conceptual utility and interpretability. One item (speaks with friends outside of school) only loaded on the fourth factor and was dropped from the scale. The remaining three factors accounted for approximately 51.8% of the variance in item ratings and assess frequency of speech in the following situations: at school, at home/with family, and in public/social settings. The 17 retained SMQ items and loadings are presented in Table 1.

Internal Consistency and Item Analysis

Internal consistency estimates for the 17-item measure were generated using the Reliability procedure in the Statistical Package for the Social Sciences 10th Version (SPSS-10). The total scale and three subscales all demonstrated very good internal reliability, as shown in Table 2.

Table 3 contains means and standard deviations for the 17 retained items from the SMQ. The frequencies with which speaking behaviors were endorsed varied widely. According to the responses collected, the least prevalent speaking behavior was “speaks to family friends (adults) s/he doesn’t know” which was marked as *never* by 76.4% of respondents. In contrast, “speaks to family in unfamiliar places (i.e., away from home) was endorsed as *never* by only 4.4% of respondents. The item for which *always* speaks was most frequently endorsed was “speaks on the phone to parents and

TABLE 1
Selective Mutism Questionnaire Item Factor Loadings

SMQ Item	Factor Loading
Factor 1 (School)	
Speaks to Most Peers at School	.474
Speaks to Selected Peers at School	.406
Answers Teacher	.820
Asks Teacher Questions	.757
Speaks to Most Teachers	.762
Speaks in Groups of Peers	.747
Factor 2 (Home/Family)	
Speaks to Family at Home When Others Present	.687
Speaks to Family in Unfamiliar Places	.595
Speaks to Extended Family	.689
Speaks on Phone to Parents/Siblings	.434
Speaks to Familiar Family Friends (Adults)	.694
Speaks to Babysitter	.672
Factor 3 (Public/Social)	
Speaks to Unfamiliar Peers	.654
Speaks with Unfamiliar Family Friends (Adults)	.767
Speaks with Doctor and/or Dentist	.667
Speaks to Store Clerks/Waiters	.794
Speaks in Clubs/Teams Outside Of School	.440

Note: Results are from a principal components analysis using varimax rotation. All cross factor item loadings < 0.4.

siblings” (41%) versus “speaks in clubs and teams outside of school” and “speaks in groups/in front of class,” which were endorsed as *always* by only 0.5% of respondents.

Age Trends

As seen in Table 4, one-way analyses of variance revealed significant differences between age groups in terms of severity of SM as measured by the SMQ. With regard to gender, the youngest group (3–5 years old) contained 70% girls, the middle group (6–8 years old) contained 69% girls, and the oldest group (9–11 years old) contained 59% girls. Pearson chi-square analysis revealed no significant differences between these gender ratios, $\chi^2(1, N = 580) = 4.38, p = .11$.

Severity Characteristics

Paired sample *t* tests revealed that the mean score of .36 (*SD* = .47) for the Public/Social subscale was significantly lower than the mean of .47 (*SD* = .52) for the Home/Family subscale, $t(560) = 49.28, p < .001$,

TABLE 2
Internal Consistency of the Selective Mutism Questionnaire (SMQ) for the Internet Group

SMQ Factor	No. of Items	Cronbach's α
Total	17	.84
School	6	.80
Home/Family	6.75	
Public/Social	5.78	

Note: $n = 589$.

TABLE 3
Item Responses on the Selective Mutism Questionnaire for the Internet Sample

Item	<i>M</i>	<i>SD</i>
Most Peers at School	.51	.76
Selected Peers at School	1.04	1.00
Answers When Called on by Teacher	.54	.81
Asks Teacher Questions	.26	.53
Speaks to Most Teachers at School	.29	.58
Speaks in Groups or in Front of the Class	.23	.49
Speaks to Family at Home When Others Present	1.47	.91
Speaks to Family in Unfamiliar Places	1.83	.89
Speaks to Extended Family not Living at Home	1.52	.90
Speaks on Phone to Parents/Siblings	1.93	1.06
Speaks with Friends Outside of School ^a	1.37	.99
Speaks to Familiar Family Friends	1.30	.97
Speaks to Unfamiliar Family Friends	.26	.53
Speaks to Babysitter	1.28	1.16
Speaks with Doctor and/or Dentist	.41	.68
Speaks to Clerks/Waiters	.35	.66
Speaks in Clubs/Teams Outside of School	.36	.58
Speaks to Unfamiliar Peers	.44	.68

Note: $n = 589$. Lower scores represent less frequent speaking behavior (more severe Selective Mutism symptoms).

^aItem deleted from scale.

and for the School subscale ($M = .47$, $SD = .52$), $t(538) = 4.53$, $p < .001$. The mean score for the School subscale ($M = .47$, $SD = .52$) was lower than for Home/Family subscale ($M = 1.57$, $SD = .64$), $t(541) = 34.34$, $p < .001$. The mean total SMQ score of 14.06 ($SD = 7.03$) did not significantly differ from that of the clinically defined Study 2 SM group described next ($M = 12.99$, $SD = 7.23$), $t(610) = .90$, $p = .369$.

STUDY 2

Method

Participants

Participants were drawn from a consecutive series of children, aged 3 to 10 years, undergoing diagnostic

evaluation at a university-based child anxiety clinic. All children met *DSM-IV* diagnostic criteria for a primary diagnosis of either SM ($n = 48$) or another anxiety disorder (without SM; $n = 18$).

The SM group consisted of 48 target children (30 female, 18 male) with a mean age of 5.83 ($SD = 1.65$). The ethnic breakdown was as follows: 64.6% Caucasian, 14.6% Latino, 10.4% mixed, 8.3% Asian/Pacific Islander, 2.1% African American, and 2.1% unreported. All 48 children received a principal diagnosis of SM based on *DSM-IV* diagnostic criteria. Most (91.7%) received a secondary or tertiary diagnosis of social phobia (SP), making it the most frequent comorbid diagnosis among this sample. The mean total number of diagnoses, including SM, assigned to a child in this group was 2.27 ($SD = .71$). The mean onset age for SM ranged from 2 to 7 years of age ($M = 3.13$, $SD = 1.16$). In terms of current treatment status at the time of evaluation, 40 (83.6%) children were untreated, 4 (8.3%) were on psychotropic medication, and treatment data were unavailable for 4 (8.3%) children.

The Non-SM Anxiety group (NonSM) consisted of 18 children (5 female, 13 male) with a mean age of 6.33 years ($SD = 1.78$). Most were Caucasian (83.3%), with 5.6% African American, 5.6% Latino, and 5.6% Asian/Pacific Islander. Principal diagnoses included obsessive-compulsive disorder (55.6%), separation anxiety disorder (22.2%), generalized anxiety disorder (5.6%), specific phobia (11.1%), and anxiety disorder not otherwise specified (5.6%). Three children had social phobia as a secondary diagnosis. The mean total number of diagnoses in this group was 1.76 ($SD = 1.03$). The onset age for the principal diagnosis ranged from 2 to 7 years of age ($M = 4.64$, $SD = 1.97$). Fifteen (83.3%) were not in treatment at the time of intake, whereas 3 (16.7%) were receiving psychotropic medication.

Procedure

Measures used in our study were collected as part of a larger intake battery routinely administered to

TABLE 4
Selective Mutism Questionnaire Scores for Different Age Groups From Internet Sample

Domains	Age Group			<i>F</i> (2, 587)	<i>p</i>
	3–5 Years ^a	6–8 Years ^b	9–11 Years ^c		
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)		
School	.33 (.44) _a	.54 (.54) _b	.62 (.56) _b	14.96	.001
Home	1.62 (.63)	1.52 (.62)	1.58 (.73)	1.42	.242
Public/Social	.28 (.40) _a	.40 (.47) _b	.53 (.56) _b	10.93	.001
Total	13.18 (6.04) _a	14.37 (7.44)	15.73 (7.83) _b	4.82	.008

Note: $N = 589$. Lower scores represent less frequent speaking behavior (more severe selective mutism symptoms). Means within a given row having different subscripts are significantly different at $p \leq .03$ in the Dunnett post hoc comparisons.

^a $n = 224$. ^b $n = 229$. ^c $n = 95$.

individuals presenting for clinical services at this clinic. Informed consent to use these data for research purposes was obtained from parents (and assent from children older than 7) prior to the assessment. Each intake evaluation included a comprehensive diagnostic evaluation, conducted by either a doctoral-level psychologist or a closely supervised doctoral student in clinical psychology. Most children in our study ($n = 61$, 92.4%) diagnosed using the Anxiety Disorders Interview Schedule for *DSM-IV* (ADIS-IV; Silverman & Albano, 1996), a semistructured clinician interview designed for use with childhood anxiety disorders. However, five children (7.5%) were diagnosed by the first author, who administered a nonstructured clinical interview. Although children were interviewed when tolerated, given their young age and the limited verbal responses typical from children with SM, parents served as the primary informant in all cases. All interviewers underwent extensive training led by a licensed psychologist (see Wood, Piacentini, Bergman, McCracken, & Barrios, 2002, for details). Prior to participating in the diagnostic interview, parents completed relevant parent report measures (e.g., SMQ, Multidimensional Anxiety Scale for Children [MASC], etc.). Interviewers did not use these ratings as the basis for their diagnoses.

Following the intake interview, for 86% of the cases in our sample, clinicians made a case presentation to a diagnostic review team led by licensed psychologists specializing in the diagnosis and treatment of childhood anxiety. During these presentations, clinicians presented the symptoms endorsed by the parent without divulging the diagnosis he or she had assigned. The review panel then discussed the case and developed a consensus *DSM-IV* diagnostic profile, including consensus clinical severity ratings (CSRs). Although not as stringent as a formal interrater reliability exercise, this procedure provided some data regarding the integrity of the diagnostic process. This procedure yielded a kappa of .92 for agreement between clinician and consensus primary diagnosis. For the small number of cases (14%) that did not undergo the formal diagnostic review, clinician-generated diagnostic information was utilized.

Measures

SMQ. The same 17-item version of the SMQ employed in Study 1 was used in Study 2.

ADIS-IV. The ADIS-IV is a semistructured diagnostic interview that assesses the major *DSM-IV* anxiety, mood, and externalizing disorders experienced by school-aged children and adolescents. Psychometric support for the ADIS includes data confirming interrater (Grills & Ollendick, 2003) and test-retest reliability

(Silverman, Saavedra, & Pena, 2001) as well as support for the concurrent and divergent validity of the social phobia and separation anxiety diagnoses assigned on the basis of the interview (Wood et al., 2002). In addition to providing a format for the qualitative diagnostic assessment, administration of the ADIS-IV also includes assignment of CSRs, based on an 8-point scale, ranging 0 (*not present*) to 4 (*clinically significant*) to 8 (*very significant*), for each diagnosis (Silverman & Albano, 1996). These CSR ratings were included in our analyses.

SASC-R. The SASC-R is a parent-report measure of child social anxiety with reported convergent and discriminant validity (La Greca & Stone, 1993). In addition, SASC-R parent report discriminated children with and without assigned social anxiety disorder diagnoses (Kristensen & Torgersen, 2006). As noted in previous research (Bergman et al., 2002; Dummit et al., 1997), social anxiety items directly pertaining to speech tend to be elevated in an SM sample. Therefore, in an effort to isolate social anxiety symptoms from SM symptoms and to more meaningfully investigate the relationship between items attempting to measure one versus the other, we analyzed data from the SASC-R with and without five items related to speaking. The internal consistencies were excellent ($\alpha = .91$ for both versions).

MASC-Parent Report (MASC-P). The MASC-P (March, Parker, Sullivan, Stallings, & Conners, 1997) is a 38-item parent-report measure of child anxiety with adequate test-retest reliability and demonstrated convergent and divergent validity (March et al., 1997; Kovacs, 1992). The original MASC is a child measure designed for ages 8 and older and not suitable for the young children in this sample. MASC-P items are identical to items from the original MASC with wording altered to match the parental perspective. Recent investigation of the MASC-P suggests a factor structure that is similar to the structure of the original child version of the measure (Baldwin & Dadds, 2007). The internal consistency of this measure in our sample was satisfactory ($\alpha = .78$).

Results

Comparisons of SM and NonSM Groups

A series of independent samples *t* tests revealed no significant group differences in age at intake, mean number of psychiatric diagnoses, or severity of primary diagnosis. Pearson chi-square analyses revealed no significant differences between the SM and NonSM groups with respect to ethnic composition, $\chi^2(1,$

$N = 61$) = 3.10, $p = .541$, or medication status, $\chi^2(1, N = 59) = 5.71$, $p = .450$, at the time of evaluation. The SM group was significantly younger at age of illness onset ($M = 3.12$, $SD = 1.17$) than the NonSM group ($M = 4.64$, $SD = 1.97$), $t(21.77) = 3.08$, $p < .01$. The SM group also contained more female children than the NonSM group, $\chi^2(1, N = 66) = 6.34$, $p = .012$.

Psychometric Properties of the SMQ

The internal consistency of the total SMQ scale and its subscales in the SM group was excellent: Total scale $\alpha = .97$, School $\alpha = .97$, Home/family $\alpha = .88$, and Public/Social $\alpha = .96$. A series of t tests were used to compare SMQ scores between children classified in the SM group versus the NonSM group. As seen in Table 5, the SM group evidenced significantly less speech across all of the domains assessed by the SMQ than did the NonSM group ($p < .001$ for all comparisons).

As displayed in Table 6, evidence of the convergent validity of the SMQ was indicated by significant correlations between SMQ scores and the SASC (with and without the talking items), MASC Social Anxiety subscale, and ADIS CSR. In support of the discriminant validity of the SMQ and as predicted, the measure was not significantly correlated with the MASC Harm Avoidance, Separation Anxiety, and Physical Symptoms subscales.

To examine sensitivity to treatment response, the SMQ was completed pre- and posttreatment for a subsample of the SM group ($n = 11$) who underwent a course of behavioral therapy (M length of treatment = 28 sessions). A paired samples t test indicated a significant increase in total SMQ scores from pretreatment ($M = 13.83$, $SD = 5.00$) to posttreatment ($M = 31.07$, $SD = 7.01$), $t(10) = 6.674$, $p < .001$, demonstrating an increase in speech following treatment.

Discussion

Despite recent research suggesting that SM may be more prevalent than previously believed (Bergman et al.,

2002; Elizur & Perednik, 2003) and clear agreement regarding the necessity for standardized assessment tools for assessing SM (e.g., Stone, 2002), our article is the first to describe a parent-report measure specifically designed to assess the core features of SM. The results of our investigation provide clear support for the psychometric properties of the new SMQ. The examination of the factor structure of the SMQ revealed a three-factor solution that was clearly interpretable and had good internal reliability and consistency. The resulting subscales (School, Home/Family, Public/Social Settings) closely reflect the clinical phenomenology of SM and allow clinicians and researchers to assess varying levels of SM symptomatology across situations, to identify symptom patterns, and/or to assess response to treatment. As such, the SMQ is likely to prove useful for treatment planning, determining treatment response, and increasing understanding about the phenomenology and course of SM.

Inspection of the data derived from the Study 1 Internet sample suggested that the youngest group (3–5-year-olds) was more impaired than the older groups (6–8 and 9–11-year-olds) on both the school and the public/social factors. There was no significant age difference for the home factor, indicating that this factor seems to be the least influenced by age-related changes in development. This study is among the first to present data, albeit cross-sectional, specifically relevant to broad age-related symptom differences among children with SM. Moreover, the results are consistent with findings that among a subset of children with SM, symptoms seem to become somewhat attenuated as children become older (Bergman et al., 2002). Although age-related differences could reflect normative developmental changes or difficulties in assessing symptoms among younger children, preliminary data indicate no significant age-related differences in SMQ scores among normal controls (Stein, Chavira, Shipon-Blum, Hitchcock, & Cohan, 2006), thus suggesting that observed age differences on the SMQ reflect true symptom differences.

The results of this study also provide support for the concurrent validity of the SMQ. Based on current understanding of the phenomenology of SM, we would predict relatively strong relationships between SMQ scores and measures of social anxiety, but not other types. In line with predictions, SMQ scores correlated significantly with MASC Social Anxiety subscale ratings but not with MASC Global and Nonsocial subscales. Convergent validity was also demonstrated by the predicted strong relationships between the SMQ and clinician-rated ADIS diagnostic clinical severity ratings as well as with parent-report SASC-R social anxiety scores. Of importance, SASC-R correlations remained high even when social anxiety items that included a speaking component were removed. This suggests that

TABLE 5
Selective Mutism Questionnaire Scores for Children With Selective Mutism (SM) Versus Those Without

Domains	SM M (SD)	NonSM M (SD)	t (64)
Total	12.99 (7.23)	46.00 (5.94)	16.05
School	.30 (0.42)	2.65 (0.49)	19.19
Home/Family	1.70 (0.76)	2.90 (0.62)	9.49
Public/Social	.34 (0.45)	2.50 (0.53)	16.43

Note: SM, $n = 48$; NonSM, $n = 18$. Lower scores represent less frequent speaking behavior (more severe SM symptoms). For all values, $p < .001$.

TABLE 6
Correlations Between Mean Selective Mutism Questionnaire (SMQ) Subscale Scores and Other Anxiety-Related Measures

Measure	SMQ Total	SMQ School	SMQ Home/Family	SMQ Public/Social
SASC-R Total	-.52 **	-.47**	-.29	-.59***
SASC-R Without Talking Items	-.44*	-.27	-.36*	-.39*
Parent MASC Total	-.21	-.18	-.21	-.24
Parent MASC Harm Av	.32	.23	.39	.26
Parent MASC Soc Anx	-.62**	-.56**	-.58**	-.60**
Parent MASC Sep Anx	.17	.16	.20	.07
Parent MASC Phys Sx	-.15	-.07	-.27	-.12
ADIS Clinical Severity ^a	-.67***	-.33*	-.56***	-.38**

Note: SASC-R = Social Anxiety Scale for Children-Revised; MASC = Multidimensional Anxiety Scale for Children-Parent Report; ADIS = Anxiety Disorders Interview Schedule; Harm Av = Harm Avoidance; Soc Anx = Social Anxiety; Sep Ax = Separation Anxiety; Phys Sx = Physical Symptoms.

^aADIS Clinical Severity correlations are for selective mutism group only.

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

correlations were not merely based on simple overlap in questions regarding speech but instead were related to the phenomenological similarity between the constructs.

One of the most important findings regarding the validity of the measure was that the SMQ was able to distinguish groups of children based on their clinically determined *DSM-IV* diagnoses. That is, SMQ scores were significantly lower among children with SM than among children with other (non-SM) anxiety diagnoses. Our study provided compelling evidence of concurrent validity in that all three subscales of the SMQ were able to make discriminations within an anxiety-disordered sample, suggesting its usefulness for the study of SM. This is an important accomplishment, as there are some indications that distinguishing between the separate anxiety disorders may be a difficult measurement task (Wood et al., 2002).

A final goal of this study was to examine the sensitivity of the SMQ to treatment change. An assessment tool responsive to changes in clinical picture is necessary for treatment research. No such instrument existed prior to the SMQ, and studies on SM treatment have relied primarily on therapists' subjective reports of changes in speech, a methodology that is clearly problematic (Stone, Kratochwill, Sladeczek, & Serlin, 2002). Results of our study indicated that the children with SM who underwent behavioral therapy showed significant changes on the SMQ, which were representative of more frequent speaking behavior following a course of behavioral treatment.

One area of widespread interest among researchers investigating SM is the understanding of the complicated relationship between the diagnostic categories of SP and SM. Given that reluctance to speak characterizes many symptoms of SP as well as symptoms of SM (Silverman & Albano, 1996), using a measure such as the SMQ to assess failure to speak can complement efforts to contrast the two groups and increase our understanding of the similarities and differences

between children in these two diagnostic categories. Although the small sample size of children with only social phobia did not allow for such a comparison in our study, the SMQ has been used by other researchers to investigate the relationship between SM and SP and will likely prove a valuable tool for future efforts addressing this important question.

Although it was not possible to verify the SM diagnoses of the Internet group, recent research has shown that clinical samples obtained via the Internet can be similar to those obtained from those using traditional clinic-based methods (Gosling, Vazire, Srivastava, & Oliver, 2004; Woods et al., 2006). To maximize the likelihood of obtaining a clinically equivalent sample, we followed the recommendations of Kraut et al. (2004), including the use of large samples and employing procedures to identify and eliminate duplicate responses from the same individual. Overall, it appears that these efforts were successful in that several key descriptive features of the Internet group were consistent with previous reports of the characteristics of children with SM (e.g., age of onset, gender ratio, etc.). Perhaps even more important, the Internet group was virtually indistinguishable from a comparison sample of children with clinically diagnosed SM in terms of demographic status and clinical severity. Thus, it is reasonably likely that this sample is, in fact, composed of children meeting criteria for SM.

Implications for Future Research, Policy, and Practice

Future studies are needed to establish the suitability of the SMQ for use with older children affected with SM. In addition, although data from a small group of openly treated children indicated that the SMQ was sensitive to the effects of treatment, these findings remain to be replicated in larger controlled trials. Fortunately, a randomized controlled psychosocial treatment

trial currently underway will provide more rigorous data on this topic. Finally, additional data are needed to replicate and extend previous findings supporting the usefulness of the SMQ in distinguishing between children with primary SM and those with primary SP or no disorder.

The SMQ appears to be a psychometrically sound measure of the core feature of SM. The availability of a relevant and methodologically solid measure that focuses directly on lack of speech has positive implications for future research of SM and related disorders. Without access to such measures, research in the past has instead relied on measurement of more peripheral symptoms or on subjective measurements that are methodologically problematic. Preliminary results reported here indicate significant decreases in SMQ scores following treatment for SM, suggesting that the measure has utility for evaluating treatment-related symptom changes. The ability to evaluate response to treatment in a standardized fashion can provide meaningful benefit to both clinical research and clinical practice.

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