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Comparison of Behavioral Profiles for Anxiety-Related Comorbidities including ADHD and Selective Mutism in Children

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Abstract

Background—Elucidating differences in social-behavioral profiles of children with comorbid presentations, utilizing caregiver as well as teacher reports, will refine our understanding of how contextual symptoms vary across anxiety-related disorders.

Methods—In our pediatric anxiety clinic, the most frequent diagnoses and comorbidities were mixed anxiety (MA; 1 anxiety disorder; N = 155), anxiety with comorbid attention-deficit hyperactivity disorder (MA/ADHD, N = 47) and selective mutism (SM, N = 48). Behavioral measures (CPRS, CTRS) were analyzed using multiple one-way multivariate analyses of covariance tests. Differences between the three diagnostic groups were examined using completed parent and teacher reports (N = 135, 46 and 48 for MA, MA/ADHD and SM groups, respectively).

Results—Comparisons across the MA, MA/ADHD and SM groups indicate a significant multivariate main effect of group for caregiver and teacher responses ($p < 0.01$). Caregivers reported that children with SM are similar in profile to those with MA, and both groups were significantly different from the MA/ADHD group. Teachers reported that children with SM had more problem social behaviors than either the MA or MA/ADHD groups. Further comparison indicates a significant main effect of group ($p < 0.001$), such that children with SM have the greatest differences in behavior observed by teachers versus caregivers.

Conclusions—Clinical profiles between MA/ADHD, MA and SM groups varied, illustrating the importance of multi-rater assessment scales to capture subtle distinctions and to inform treatment planning given that comorbidities occur frequently in children who present with anxiety.

Keywords

attention deficit disorder with hyperactivity; anxiety disorders; school children; selective mutism

Introduction

Anxiety disorders are the most prevalent mental health disorders in children/adolescents¹ with up to 20% of children scoring above diagnostic cut-offs for one or more anxiety disorders^{2,3}. However, pediatric anxiety disorders are often undetected and consequently untreated^{3,4}. Children with anxiety disorders have an increased risk for many psychiatric disturbances, substance abuse and conduct problems as adolescents⁵ indicating that anxiety disorders have persistent course and negative outcomes⁶. However, early intervention has

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been shown to be effective⁷ and maintained with follow-up^{8,9}. Consequently, timely diagnosis and treatment of children is vital in ensuring their long-term mental health.

In order to increase early and appropriate diagnosis and treatment, it is essential to understand the presentation of anxiety disorders and their frequent comorbidities, such as other anxiety disorders and ADHD. Between 15–35% of children with ADHD or an anxiety disorder have both at the same time, such that ADHD is the most common externalizing comorbidity for anxiety^{10–12} and is associated with marked social impairments, as well as difficulties in school settings¹³. However, there is less research available on other disorders that co-occur with anxiety and how they compare across school and home settings. For example, selective mutism (SM) is marked by a consistent failure to speak in certain social situations despite speaking and knowledge of the spoken language in other situations, namely at home. Often SM is identified when the child enters the school system, although age of onset occurs between 2–5 years^{14–16}. Although children with SM are often described as ‘shy’, SM significantly interferes with social communication and educational/occupational achievement. As adults, people who had SM as children often have significant social anxiety and ongoing deficits in social communication^{15,17}. In addition, the long-term impairment from SM and response to treatment may be impacted by age of diagnosis^{18,19}.

Recent studies have shown that teachers are better at identifying some types of anxiety in children, as compared to parents²⁰. In addition, examining responses across multiple raters aids in the development of broader sense of impairment²¹. This study was undertaken to examine the prevalence of anxiety comorbidities in a pediatric population and to distinguish identifying characteristics between common presentations, including other anxiety disorders, ADHD and SM. Conners’ Parent Rating Scale (CPRS) and Conners’ Teacher Rating Scale (CTRS) were used as they are broad, comprehensive behavioral screening tools that are easy to use and are familiar to most psychologists and psychiatrists. We hypothesized that there would be qualitative distinctions between presentation of anxiety disorders and common comorbidities. In particular, children with SM would have greater impairments in social behavior than those with MA or MA/ADHD. Furthermore, we hypothesized that teachers would give higher scores of social impairment than caregivers to children with SM, and thus may be critical for early and more accurate identification of the disorder.

Materials and Methods

The subjects in this study were seeking services at an urban mental health clinic that treats anxiety disorders in youth. Calls by caregivers, teachers, pediatricians and others seeking services for treatment were screened to ensure that clients were appropriate for evaluation by the clinic. If the information collected during the screening suggested significant anxiety issues, registration in the clinic was commenced. Caregivers were mailed information and questionnaires to complete, as well as those for their child’s teacher(s). Caregivers completed questionnaires providing information on their child’s psychiatric illness, development and treatment history. Teachers were asked to complete forms about the child’s behavior and affective symptoms, as well as how they believed the child is accepted by their peers. Caregivers and their children met with the clinician to complete the evaluation. If the child met criteria for an anxiety disorder, the family was asked to provide consent, and the child was asked to provide assent, to the use of their de-identified data to be included as part of an ongoing risk and protective factors study. All of our study procedures are in compliance with the Code of Ethics of the World Medical Association (Declaration of Helsinki) and were approved by the university IRB.

The clinic sample includes 305 children ages 2 – 19 with enrollment occurring between 2002 and 2010. Inclusion criteria were the child met criteria for at least one anxiety disorder

or SM, this disorder was the primary reason for seeking evaluation or treatment, and at least one caregiver gave consent. Subjects with incomplete diagnostic information were excluded. The mean age of the remaining sample (N=292) was 10.06 (SD = 3.89) and 50.30% were male. Over half of the study sample self-identified as Caucasian (55.30%), with remainder identifying as Latino (17.90%), African-American (15.50%), Other (8.10%) and Asian (3.10%). Education information was available for 62.50% of fathers and 60% of mothers for this clinical sample. Of these 175 fathers and 168 mothers, most (18.80% of fathers, 21.20% of mothers) had completed college, or more (20.50%, 15.80% respectively). A small subset (4.00% of fathers and mothers) had no high school diploma, or obtained a high school diploma but did not attend college (11.30% of fathers, 9.90% of mothers). The remaining 7.90% of fathers and 9.20% of mothers continued their studies after high school, but did not obtain a college degree.

Youth and parents completed paper-and-pencil measures and received a two-part diagnostic evaluation consisting of: (1) a general mental health evaluation interview administered during the first visit to obtain information about the presenting problem as well as developmental, family, and treatment history; and (2) a semi-structured interview administering relevant diagnostic modules from the Anxiety Disorders Interview Schedule for Children (ADIS-IV-C/P^{22,23}) during the second visit a week later. The ADIS-IV-C/P is a semi-structured interview used to diagnose anxiety disorders, as well as mood disorders, externalizing disorders, and screens for pervasive developmental disorders and SM. The ADIS has demonstrated excellent retest reliability²⁴, convergent validity²⁵, and good inter-rater reliability²⁶. The ADIS was performed by an MD, PhD or LCSW trained clinician, and an interdisciplinary team including child psychiatrists, licensed clinical psychologists, social workers and trainees reviewed assessments for each patient.

SM, MA and MA/ADHD Groups

The most common comorbidities were other anxiety disorders, ADHD and SM within this clinic sample. The large number of children with SM is due to this anxiety center being a regional referral center for children with SM. Children were grouped into three categories, based on completed initial evaluations and DSM-IV criteria, to determine behavioral differences between the groups. Children with pervasive developmental disorders, learning disorders, phonological disorders, depression, tic disorders and psychosis were excluded (N=42) given the variability of their clinical presentations. The MA groups included diagnoses defined as anxiety disorders in DSM-IV, including Generalized Anxiety Disorder (GAD), Obsessive Compulsive Disorder (OCD), Social Anxiety Disorder (SA), Separation Anxiety Disorder (SAD) and anxiety not otherwise specified (NOS). The MA group was comprised of 155 children (N=85 female, N=70 male), where as the MA/ADHD group was comprised of 47 children (N=12 female, N=35 male). Children were included in the SM group if they fulfilled ADIS/DSM-IV diagnostic criteria when seen in the clinic. The SM group was comprised of 48 children (N=35 female, N=13 male).

Sociodemographic information about the children in these groups, as well as their parents, is shown in Table 1. Of the 229 subjects who participated, 21 did not complete the CTRS and the CPRS. Our final study sample was N=135 with MA, N=46 with MA/ADHD and N=48 with SM, with ages ranging between 3–16 as Conners' rating scales are valid for 3–17 year olds. Completed teacher reports are more difficult to obtain than parent reports in a clinic sample. Although some subjects were missing either CPRS or CTRS (34 and 84 MA, 14 and 20 MA/ADHD, and 9 and 15 SM, respectively), analyses of CPRS and CTRS profiles included all subjects with completed reports, and did not exclude subjects that only completed one in order to minimize missing data bias and to maximize our sample size. In our subset of subjects (N=32 SM, 25 MA/ADHD and 55 MA) where both measures were

completed, difference scores between CPRS and CTRS across identical subscales for each individual were calculated in order to test differences across raters at school versus home.

Measures

Long versions of the Conners' Parent Rating Scale – Revised (CPRS-R:L²⁷) and the Conners' Teacher Rating Scale – Revised (CTRS-R:L²⁸)—As ADHD and SM were two of the most common comorbid diagnoses in our clinic sample (see below), and SM manifests differently based on environment, the CTRS and CPRS were analyzed as they address social behavior in home and school settings. CPRS-R:L is an 80-item parent-report scale usually used to help assess ADHD, behavioral and internalizing symptoms in people aged 3–17 years. Caregiver and teachers rate symptoms on 14 (Figure 1) or 13 (Figure 2) scales, respectively, on a four point Likert scale ranging from 0 (Not true at all) to 3 (Very much true). The CTRS-R:L is similar to the CPRS-R:L, although it has 59 questions and does not include a psychosomatic subscale. Caregivers were instructed to fill out the CPRS-R:L and to have their child's teacher(s) complete the CTRS-R:L prior to the initial clinic visit.

Analysis

All statistical analyses were performed using SPSS Statistics 19²⁹.

Comorbidity Prevalence—The number of discrete diagnoses for all subjects for whom diagnostic information was available (N=292) was calculated. To determine the most prevalent diagnoses in the clinic sample, the frequency of diagnosis across primary, secondary and tertiary diagnoses was performed. Across all levels, anxiety diagnoses were most common (63.99% of all diagnoses). These included GAD, OCD, anxiety NOS, and SA. ADHD accounted for 12.34% of all diagnoses, and SM for 9.98%.

Caregiver and Teacher Reports Across Groups—To examine both differences across SM, MA, and MA/ADHD groups on the CPRS-R:L and CTRS-R:L subscales, and differences between home and school behaviors, separate one-way multivariate analyses of covariance tests (MANCOVA) were conducted with the diagnostic category (SM, MA, MA/ADHD) as the fixed factor and the subscales as the dependent variables. Main effects across the three groups were elaborated upon by analyses of covariance (ANCOVA) tests on the subscales of interest, followed by post-hoc Tukey analyses. Two of the scales on CPRS-R:L and CTRS-R:L are total scales, and as such they were analyzed using separate one-way ANCOVAs, with diagnostic category as the fixed factor and subscale as dependent variable. As gender and age differed significantly across the groups (Table 1), they were used as covariates. To assess differences in racial demographics of the diagnostic groups (Table 1) we compared Caucasian and non-Caucasian groups because of uneven distributions across non-Caucasian groups. In this analysis there were no significant differences across diagnostic groups (Table 1). In addition, there were no differences across parental education levels between groups (Table 1). Mean difference scores between CPRS and CTRS across identical subscales were similarly compared (psychosomatic was excluded as it does not appear on the CTRS-R:L, Figures 2 & 3). No adjustments for multiple corrections were done given the exploratory design of this clinical study and in order to minimize Type II error rates.

Results

All children in our clinical sample were diagnosed with at least one anxiety disorder or SM, with 55.80% diagnosed with one or more comorbidities. Across primary, secondary and tertiary diagnoses for all individuals in the study, the most common diagnoses were GAD

(16.63%), SA (13.70%), ADHD (12.34%), OCD (10.37%), SM (9.98%), SAD (7.83%) and Anxiety NOS (5.87%). Within the MA group, 65.08% of the individuals had no comorbidities. Across the entire subset of children with MA, the most common diagnosis was GAD (25.81%), followed by OCD (21.51%), anxiety disorder NOS (9.68%), separation anxiety (9.14%) and specific phobia (8.06%). As per the definition, all individuals in the MA/ADHD group had at least one comorbidity. The most prevalent non-ADHD diagnoses in this subgroup were GAD (30.36%), followed by separation anxiety (16.07%), anxiety disorder NOS (12.50%), specific phobia (10.71%) and OCD (8.92%). For the SM group, the most common comorbidities were social anxiety disorder (74.28%) and GAD (11.42%). However, 41% of the children with SM did not fit full criteria for other current anxiety disorders. Note this does not rule out sub threshold levels of anxiety or past history of anxiety disorders because the ADIS focuses on current symptomology. There was no effect of age ($X^2(17) = 22.08, p = 1.82$), gender ($X^2(1) = 0.08, p = 0.78$) or ethnicity ($X^2(4) = 7.99, p = 0.09$) on current number of comorbidities.

Primary Caregiver Reports Across Groups

For CPRS subscales the MANCOVA revealed a significant multivariate main effect of group (Wilks' $\Lambda = 0.262, F(9,156) = 36.709, p < 0.001$). There were significant differences across groups on multiple measures (Figure 1). Post-hoc analyses showed that children with SM had significantly lower scores on oppositional behavior, cognitive problems/inattention, hyperactivity, ADHD index, restless/impulsive, total global index, inattention, hyperactive/impulsive and DSM-IV total scores compared to their peers with MA/ADHD ($p = 0.01$ for all). A similar pattern emerged for comparisons across SM and MA groups ($p = 0.03$). Social impairment scores between SM and MA trended towards significance ($p = 0.06$), with children with SM scoring higher. In the psychosomatic domain, children with SM had significantly lower scores than either the MA/ADHD ($p = 0.03$) and MA ($p = 0.018$) groups. MA and MA/ADHD group comparisons were identical to SM and MA/ADHD group results ($p = 0.01$) with the exception of oppositional behavior, which was not significantly different ($p > 0.05$). There was no significant difference across the three groups in scores on the anxious/shy subscale ($p > 0.05$).

Teacher Reports Across Groups

As we found for the primary caregiver reports, the MANCOVA revealed a significant multivariate main effect of group (Wilks' $\Lambda = 0.211, F(9,97) = 40.389, p < 0.001$) in CTRS measures. Results show that teachers report children with SM as significantly different from those with MA and MA/ADHD across multiple measures of the CTRS (Figure 2). Specifically, children with SM have significantly lower scores than their peers with MA/ADHD in measures of oppositional behavior, hyperactivity, ADHD Index, restless/impulsive, emotional lability, total global index, DSM-IV inattentive as well as hyperactive/impulsive and total score ($p = 0.01$ for all). In addition, children with SM and MA were similar in multiple measures ($p > 0.05$), with the exception of lower scores on hyperactivity, ADHD Index, restless/impulsive, total global index, hyperactive/impulsive and DSM IV total T-score ($p = 0.015$ for all). However, children with SM had significantly higher scores in the social problem domain than either the MA/ADHD or MA groups ($p = 0.01$ for both). There were no significant differences across MA and MA/ADHD groups on any CTRS measures, nor was there a significant difference between the three groups on the anxious/shy subscale ($p > 0.05$ for all).

Comparison of Primary Caregiver and Teacher Reports

Given that behavioral profiles of children vary in school to home environments, we compared the differences across setting reports by measuring differences between CPRS and CTRS scores. There was a statistically significant difference between diagnostic groups

across environments (Wilk's $\Lambda = 0.412$; $F(26, 176) = 9.649$, $p < 0.001$). Figure 3 summarizes the difference scores between caregiver and teacher ratings across all three groups. Mean difference scores in the cognitive problems domain for children with SM were significantly different from both MA/ADHD and MA groups, as were the scores on the inattention measure ($p < 0.01$ for all), such that caregiver and teacher scores were close to equal for the SM group on many measures, but for either MA group parents gave greater impairment ratings than teachers. There were also significant differences in the social problems subscale ($p = 0.013$). Parents gave greater impairment ratings on this measure than teachers for both MA groups, but teachers rated children with SM as having greater social impairments than parents. These results indicate that on multiple measures parents rate children with MA or MA/ADHD as having greater difficulties than teachers, where as the reverse is true with regards to social problems only in the case of SM.

Discussion

This study confirms evidence that anxiety disorders are often comorbid with other psychiatric disorders, including other anxiety disorders, ADHD and SM⁶. Establishing a detailed behavioral profile of common anxiety disorders and comorbidities will aid in increasing diagnosis and treatment, which is necessary to prevent long term effects of anxiety disorders in children that continue on into adulthood. Our results also indicate that children with SM differ across multiple measures from children with other anxiety disorders. In addition, ratings across caregiver and teacher respondent groups differ significantly, indicating which features of SM, MA and MA/ADHD are most difficult in school settings, developing a more complete summary of each condition's contextual impairments. Of particular significance is the difference in social problems scores between diagnostic groups and respondents. Caregivers reported equal levels of social problems between SM, MA and MA/ADHD children, while teachers indicated greater social problems in children with SM compared to either MA group. The similarities in teacher ratings between MA and MA/ADHD groups also provide novel insight into how disruptive anxiety is in a classroom setting, arguing for careful assessment of children referred based on behavior at school. Teachers gave significantly higher impairment scores to children with SM on social problems compared to parents. As SM manifests most strongly outside the home these results were not unexpected, yet the degree to which these scores differ when compared to those across other diagnostic groups is striking.

Caregiver and teacher ratings of anxiety severity correspond to previously published studies³⁰. CPRS was able to differentiate between MA, MA/ADHD and SM, although CTRS results do not distinguish between MA and MA/ADHD groups. The SM, MA and MA/ADHD groups did not differ significantly in anxiety subscale scores, arguing that children with SM display levels of anxious behavior similar to their peers with other, traditional, anxiety diagnoses. This is of particular importance as SM is not formally an anxiety disorder according to DSM-IV. However, SA is strongly comorbid with SM^{19,31} and most clinicians find SM comorbid with SAD as well as ongoing SA over the course of development. Children with SM report anxiety levels similar to those with social phobia^{32,33}, which has led some to postulate that SM is an avoidance behavior related to SA³⁴. The similarity in anxiety measures across child self-report as seen in previous studies, as well as the similarities across settings and reporters in this study, argues for the contextualization of SM as a separate anxiety disorder. However, much work remains to be done to better understand the relationship between anxiety and the development of SM.

In our clinic sample we found that approximately 10% of children referred to our specialty anxiety clinic had SM. Our clinical and specialty expertise in SM has contributed to some of these referrals and the number of SM children was greater than what was expected^{35,36} in

comparison to other general clinic populations. In addition, significantly more girls than boys had an SM diagnosis. This is in line with some previous studies^{16,37,38}, although other clinical reports have shown only a slightly higher prevalence in girls^{39,40} or comparable rates between sexes^{30,35,41}. It has been argued that such differences in rates across sexes is due to social perceptions of 'shy' or 'anti-social' behavior⁴², or due to setting in which diagnosis is made³⁰. The cultural beliefs around 'shyness'⁴³ are also likely to contribute to under diagnosis of SM in general.

The results of this study have multiple implications for clinical practice. Using CPRS and CTRS enabled us to capture behavior at both home and school settings, and we show that these scales are sensitive not only for ADHD diagnoses, but capable of identifying common anxiety symptom-related behaviors and possible comorbidities. The marked social impairments evidenced by the behavior of SM children indicates that this disorder is more impairing than previously believed, particularly outside the home. This argues for more comprehensive screening for anxiety disorders in general that include ratings from settings outside the home, such as school. However, SM is not considered a common condition and may be underdiagnosed if symptoms are not severely impacting functioning. More resources for support to aid in screening and obtaining treatment are necessary. We propose that based on these results, clinicians pay particular attention to children who appear markedly quiet or shy, and to parents who mention that their children have atypical behavior at school or community settings or even inconsistent behavior at home or familiar settings. Increased screening for all anxiety disorders and SM, and appropriate referral to psychiatric specialists, will also help ensure positive long-term health for children with anxiety disorders.

Limitations of this study include an unequal number of respondents for CPRS and CTRS. As these were used as baseline measures on entering the study, obtaining responses following initiation of treatment would have confounded the results and made later obtained scales difficult to interpret. Getting busy teachers to complete additional paperwork is an ongoing challenge. More persistent parents in better resourced schools may have been able to facilitate CTRS completion. We focused on CPRS/CTRS because they are easy to add to a pediatric assessment, well-validated, commonly used to diagnose/assess a range of psychiatric symptoms, provide details of overall behavior across home/school settings, and are appropriate for young children^{27,28}. Other diagnostic questionnaires may provide more information of specific social problems or measures of anxiety, although few available screening assessments have paired teacher and parent ratings that can be compared directly and visually graphed.

In addition, as this clinic is a regional center for pediatric anxiety disorders, children come from a variety of urban and rural settings. There may be differences across groups between home environments that were not addressed in this study. There may also be differences between ethnic groups that we were not able to assess due to the small percentage of non-Caucasian subjects in each diagnostic group (Table 1). These limitations inform future studies, as utilizing multiple questionnaires, comparing home settings and obtaining higher response rates may illuminate more similarities and differences across the disorders to aid in screening. Furthermore, replication of this study is warranted to ensure findings hold across samples without such limitations. In addition, examining both parental anxiety as well as child self-report of behavioral impairments across home and school settings may help develop a more accurate understanding of function, as results may be influenced by a parent's own history response to their child's anxiety. Current clinical practice often prohibits school or home observation visits, so having teachers rate the behavior of the child in comparison to typical groups is particularly helpful when caregiver anxiety or family history may bias assessments. Ideally, multi-teacher and multi-caregiver assessments may be

required in childhood disorders especially with decreasing time to directly observe children in clinical and other settings.

Conclusion

Presentation of anxiety disorders in pediatric patients differs significantly based on comorbidity, and these differences can aid in proper and early identification and treatment. Children with SM have greater social problems than their peers with other, traditional anxiety disorders. Comparisons across raters indicate that children with SM, MA and MA/ADHD manifest different behaviors based on setting and illuminate the importance of having responses from multiple raters across contexts, including teachers, to establish the severity of impairment. While it had been previously believed that SM manifested most significantly in social settings, our results support the view that SM along with other anxiety disorders require multi-contextual evaluations. Accurate and early diagnosis and referral to treatment is imperative to ensure that children with anxiety develop into healthy adults.

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References

1. Kessler RC, Avenevoli S, Costello EJ, et al. Prevalence, Persistence, and Sociodemographic Correlates of DSM-IV Disorders in the National Comorbidity Survey Replication Adolescent Supplement. *Arch Gen Psychiatry*. Dec 5.2011
2. Pine DS, Helfinstein SM, Bar-Haim Y, Nelson E, Fox NA. Challenges in developing novel treatments for childhood disorders: lessons from research on anxiety. *Neuropsychopharmacology*. Jan; 2009 34(1):213–228. [PubMed: 18754004]
3. Chavira DA, Stein MB, Bailey K, Stein MT. Child anxiety in primary care: prevalent but untreated. *Depress Anxiety*. 2004; 20(4):155–164. [PubMed: 15643639]
4. Schwartz RH, Freedy AS, Sheridan MJ. Selective mutism: are primary care physicians missing the silence? *Clin Pediatr (Phila)*. Jan-Feb;2006 45(1):43–48. [PubMed: 16429215]
5. Bittner A, Egger HL, Erkanli A, Jane Costello E, Foley DL, Angold A. What do childhood anxiety disorders predict? *J Child Psychol Psychiatry*. Dec; 2007 48(12):1174–1183. [PubMed: 18093022]
6. Connolly SD, Suarez L, Sylvester C. Assessment and treatment of anxiety disorders in children and adolescents. *Curr Psychiatry Rep*. Apr; 2011 13(2):99–110. [PubMed: 21225481]
7. Rapee RM, Kennedy SJ, Ingram M, Edwards SL, Sweeney L. Altering the trajectory of anxiety in at-risk young children. *Am J Psychiatry*. Dec; 2010 167(12):1518–1525. [PubMed: 20810472]
8. Hirshfeld-Becker DR, Micco JA, Mazursky H, Bruett L, Henin A. Applying cognitive-behavioral therapy for anxiety to the younger child. *Child Adolesc Psychiatr Clin N Am*. Apr; 2011 20(2):349–368. [PubMed: 21440860]
9. Cartwright-Hatton S, McNally D, Field AP, et al. A new parenting-based group intervention for young anxious children: results of a randomized controlled trial. *J Am Acad Child Adolesc Psychiatry*. Mar; 2011 50(3):242–251. e246. [PubMed: 21334564]
10. Jarrett MA, Ollendick TH. A conceptual review of the comorbidity of attention-deficit/hyperactivity disorder and anxiety: implications for future research and practice. *Clin Psychol Rev*. Oct; 2008 28(7):1266–1280. [PubMed: 18571820]
11. Jensen PS, Mrazek D, Knapp PK, et al. Evolution and revolution in child psychiatry: ADHD as a disorder of adaptation. *J Am Acad Child Adolesc Psychiatry*. Dec; 1997 36(12):1672–1679. discussion 1679–1681. [PubMed: 9401328]
12. Souza I, Pinheiro MA, Mattos P. Anxiety disorders in an attention-deficit/hyperactivity disorder clinical sample. *Arq Neuropsiquiatr*. Jun; 2005 63(2B):407–409. [PubMed: 16059589]
13. Larson K, Russ SA, Kahn RS, Halfon N. Patterns of comorbidity, functioning, and service use for US children with ADHD, 2007. *Pediatrics*. Mar; 2011 127(3):462–470. [PubMed: 21300675]

14. Black B, Uhde TW. Psychiatric characteristics of children with selective mutism: a pilot study. *J Am Acad Child Adolesc Psychiatry*. Jul; 1995 34(7):847–856. [PubMed: 7649954]
15. Steinhausen HC, Wachter M, Laimböck K, Metzke CW. A long-term outcome study of selective mutism in childhood. *J Child Psychol Psychiatry*. Jul; 2006 47(7):751–756. [PubMed: 16790010]
16. Steinhausen HC, Juzi C. Elective mutism: an analysis of 100 cases. *J Am Acad Child Adolesc Psychiatry*. May; 1996 35(5):606–614. [PubMed: 8935207]
17. Remschmidt H, Poller M, Herpertz-Dahlmann B, Hennighausen K, Gutenbrunner C. A follow-up study of 45 patients with elective mutism. *Eur Arch Psychiatry Clin Neurosci*. Dec; 2001 251(6):284–296. [PubMed: 11881843]
18. Kolvin I, Fundudis T. Elective mute children: psychological development and background factors. *J Child Psychol Psychiatry*. Jul; 1981 22(3):219–232. [PubMed: 6167589]
19. Cohan SL, Price JM, Stein MB. Suffering in silence: why a developmental psychopathology perspective on selective mutism is needed. *J Dev Behav Pediatr*. Aug; 2006 27(4):341–355. [PubMed: 16906012]
20. Viana AG, Beidel DC, Rabian B. Selective mutism: a review and integration of the last 15 years. *Clin Psychol Rev*. Feb; 2009 29(1):57–67. [PubMed: 18986742]
21. Comer JS, Kendall PC. A symptom-level examination of parent-child agreement in the diagnosis of anxious youths. *J Am Acad Child Adolesc Psychiatry*. Jul; 2004 43(7):878–886. [PubMed: 15213589]
22. Silverman, WK.; Albano, AM. *The Anxiety Disorders Interview Schedule for DSM-IV-Child and Parent Versions*. London: Oxford University Press; 1996.
23. Silverman, WK.; Albano, AM. *The Anxiety Disorders Interview Schedule (ADIS-IV) Child Interview Schedule*. London: Oxford University Press; 2006.
24. Silverman WK, Saavedra LM, Pina AA. Test-retest reliability of anxiety symptoms and diagnoses with the Anxiety Disorders Interview Schedule for DSM-IV: child and parent versions. *J Am Acad Child Adolesc Psychiatry*. Aug; 2001 40(8):937–944. [PubMed: 11501694]
25. March JS, Parker JD, Sullivan K, Stallings P, Conners CK. The Multidimensional Anxiety Scale for Children (MASC): factor structure, reliability, and validity. *J Am Acad Child Adolesc Psychiatry*. Apr; 1997 36(4):554–565. [PubMed: 9100431]
26. Rapee RM, Barrett PM, Dadds MR, Evans L. Reliability of the DSM-III-R childhood anxiety disorders using structured interview: interrater and parent-child agreement. *J Am Acad Child Adolesc Psychiatry*. Sep; 1994 33(7):984–992. [PubMed: 7961354]
27. Conners CK, Sitarenios G, Parker JD, Epstein JN. The revised Conners' Parent Rating Scale (CPRS-R): factor structure, reliability, and criterion validity. *J Abnorm Child Psychol*. Aug; 1998 26(4):257–268. [PubMed: 9700518]
28. Conners CK, Sitarenios G, Parker JD, Epstein JN. Revision and restandardization of the Conners Teacher Rating Scale (CTRS-R): factor structure, reliability, and criterion validity. *J Abnorm Child Psychol*. Aug; 1998 26(4):279–291. [PubMed: 9700520]
29. SPSS. 19. Armonk, NY: IBM;
30. Carbone D, Schmidt LA, Cunningham CC, et al. Behavioral and socio-emotional functioning in children with selective mutism: a comparison with anxious and typically developing children across multiple informants. *J Abnorm Child Psychol*. Nov; 2010 38(8):1057–1067. [PubMed: 20496108]
31. Cohan SL, Chavira DA, Stein MB. Practitioner review: Psychosocial interventions for children with selective mutism: a critical evaluation of the literature from 1990–2005. *J Child Psychol Psychiatry*. Nov; 2006 47(11):1085–1097. [PubMed: 17076747]
32. Yeganeh R, Beidel DC, Turner SM. Selective mutism: more than social anxiety? *Depress Anxiety*. 2006; 23(3):117–123. [PubMed: 16421889]
33. Yeganeh R, Beidel DC, Turner SM, Pina AA, Silverman WK. Clinical distinctions between selective mutism and social phobia: an investigation of childhood psychopathology. *J Am Acad Child Adolesc Psychiatry*. Sep; 2003 42(9):1069–1075. [PubMed: 12960706]
34. Bogels SM, Alden L, Beidel DC, et al. Social anxiety disorder: questions and answers for the DSM-V. *Depress Anxiety*. Feb; 2010 27(2):168–189. [PubMed: 20143427]

35. Bergman RL, Piacentini J, McCracken JT. Prevalence and description of selective mutism in a school-based sample. *J Am Acad Child Adolesc Psychiatry*. Aug; 2002 41(8):938–946. [PubMed: 12162629]
36. Kumpulainen K, Rasanen E, Raaska H, Somppi V. Selective mutism among second-graders in elementary school. *Eur Child Adolesc Psychiatry*. Mar; 1998 7(1):24–29. [PubMed: 9563810]
37. Kristensen H, Torgersen S. A case-control study of EAS child and parental temperaments in selectively mute children with and without a co-morbid communication disorder. *Nord J Psychiatry*. 2002; 56(5):347–353. [PubMed: 12470308]
38. Kristensen H. Non-specific markers of neurodevelopmental disorder/delay in selective mutism--a case-control study. *Eur Child Adolesc Psychiatry*. Apr; 2002 11(2):71–78. [PubMed: 12033747]
39. Cunningham CE, McHolm A, Boyle MH, Patel S. Behavioral and emotional adjustment, family functioning, academic performance, and social relationships in children with selective mutism. *J Child Psychol Psychiatry*. Nov; 2004 45(8):1363–1372. [PubMed: 15482497]
40. Dummit ES 3rd, Klein RG, Tancer NK, Asche B, Martin J, Fairbanks JA. Systematic assessment of 50 children with selective mutism. *J Am Acad Child Adolesc Psychiatry*. May; 1997 36(5):653–660. [PubMed: 9136500]
41. Elizur Y, Perednik R. Prevalence and description of selective mutism in immigrant and native families: a controlled study. *J Am Acad Child Adolesc Psychiatry*. Dec; 2003 42(12):1451–1459. [PubMed: 14627880]
42. McInnes A, Manassis K. When silence is not golden: an integrated approach to selective mutism. *Semin Speech Lang*. Aug; 2005 26(3):201–210. [PubMed: 16155858]
43. Burstein M, Ameli-Grillon L, Merikangas KR. Shyness Versus Social Phobia in US Youth. *Pediatrics*. Nov; 2011 128(5):917–925. [PubMed: 22007009]

Figure 1.

Mean (SD) CPRS scores across SM, MA and MA/ADHD groups.

** Statistical significance between groups ($F(2,169) = 2.817 - 21.357$; $p < 0.01$)

Figure 2.

Mean (SD) CTRS scores across SM, MA and MA/ADHD groups.

** Statistical significance between groups ($F(2,107) = 4.494 - 13.088$; $p < 0.01$)

Figure 3.

Mean difference scores across caregiver and teacher reports. Shaded region indicates higher teacher ratings compared to caregiver.

* Indicates significant differences between groups ($F(2,101) = 3.114-10.620$; $p < 0.05$)

Table 1

Sociodemographic characteristics of SM, MA and MA/ADHD subgroups

	SM	MA	MA/ADHD
Age **			
Mean Age (SD) ^a	6.53 (2.63)	10.77 (3.88)	10.00 (3.14)
Sex **			
% Male ^b	27.08	45.16	74.47
Ethnicity ^c			
% Caucasian	50.00	49.68	70.21
% African-American	18.75	11.61	12.77
% Latino	12.50	25.16	12.77
% Asian	10.42	2.58	0
% Native American	0	0	0
% Other	6.25	10.97	4.26
Paternal education ^d			
% No HS diploma	0	3.53	0
% HS diploma	17.65	18.82	8.33
% Some college	11.76	15.29	8.33
% College degree	35.29	30.59	37.50
% More	35.29	31.76	45.83
Maternal education ^e			
% No HS diploma	9.38	0	3.85
% HS diploma	9.38	21.95	11.54
% Some college	9.38	17.07	11.54
% College degree	37.50	37.80	42.31
% More	34.38	23.17	30.77

Age and gender differed significantly between groups

**
 $p < 0.01$ ^aBrown Forsythe (2,163) = 33.71, $p < 0.01$,^b $\chi^2 (2) = 22.89$, $p < 0.01$,^cEthnicity: $\chi^2 (4) = 19.41$, $p < 0.01$; Comparing Caucasian vs non-Caucasian $\chi^2 (2) = 5.46$, $p = 0.065$,^d $\chi^2 (8) = 5.47$ $p = 0.707$,^e $\chi^2 (8) = 12.36$ $p = 0.136$;

HS (high school)