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Parent and Teacher Concordance on the Social Responsiveness Scale for Children with Autism

Gazi Azad, PhD, Erica Reisinger, MEd, Ming Xie, MS, and David S. Mandell, ScD

University of Pennsylvania Perelman School of Medicine, Center for Mental Health Policy & Services Research, 3535 Market Street, 3rd Floor, Philadelphia, PA, 19104-3309

Abstract

There are inconsistent findings regarding parent and teacher agreement on behavioral ratings of their children with autism. One possible reason for this inconsistency is that studies have not taken autism severity into account. This study examined parent and teacher concordance of social behavior based on symptom severity for children with autism. Participants were 123 parent-teacher dyads who completed the Social Responsiveness Scale. Symptom severity was assessed using the Autism Diagnostic Observation Schedule (ADOS). Results indicated that parent and teacher ratings were statistically significantly correlated at the beginning and end of the academic year, but only for severely affected children. Teacher report of social deficits was correlated with symptom severity as measured by the ADOS; parent report was not. These findings have implications for improving assessment procedures and parent-teacher collaboration.

Keywords

social behavior; parent-teacher relationships; autism; autism spectrum disorder; Social Responsiveness Scale

Best practices in assessing and treating children with autism encourages the use of multiple sources of information (Bagnato and Neisworth, 1991; Voelker, Shore, Lee, and Szuszkiewicz, 2000). Multi-informant assessment provides a richer and more accurate picture of the wide variety of social-communication and behavioral challenges that children with autism experience (Jepsen, Gray, and Taffe, 2012; Macintosh and Dissanayake, 2006, Matson and Nebel-Schwalm, 2007). Informants are expected to report on the child's strengths and weaknesses, and subsequently prioritize related interventions (Rapin, Steinberg, and Waterhouse, 1999).

Agreement among informants who know the child well, such as parents and teachers, can profoundly affect the selection of interventions by the treatment team, consistency of

Correspondence should be addressed to: Gazi Azad PhD; gaziiazad@upenn.edu; Tel: 215-573-7087, Fax: 215-349-8715.

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Compliance with Ethical Standards

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent was obtained from all individual participants included in the study.

practices across home and school, and parent satisfaction with care (Sheridan & Kratochwill, 2008; Tucker & Schwartz, 2013). If parents and teachers show high disagreement, it may be more difficult for them to come to a consensus about treatment targets and implement interventions with fidelity across home and school. Therefore informant discrepancy has emerged as a critical area of study (De Los Reyes, 2011; Drabick and Gadow, 2012; Gadow and Drabick 2012; Kaat, Gadow, and Lecavalier, 2013). In the following introduction, we review the literature on agreement between parent and teacher ratings, why it is important to examine informant agreement on social skills, and the moderating effect of symptom severity on informants' agreement.

There are inconsistent findings regarding the extent to which informants agree about the level of impairment in the same child. Constantino et al. (2000; 2003) reported strong agreement between parents and teachers on the social behaviors of children with autism using the Social Responsiveness Scale (SRS), and this agreement showed stability in a two-year follow-up. Other studies have not replicated this finding. For example, a modest correlation was found between parents and teachers on measures of behavior (Murray, Ruble, Willis, and Molloy, 2009; Rapin et al., 1999) and social skills (Murray et al., 2009) for children with autism.

Some studies find low agreement between parents and teachers. Evidence to date suggests that patterns of agreement between parents and teachers of typically developing children do not apply to children with autism (Jepsen et al., 2012). For example, Kanne, Abbacchi, and Constantino (2009) found moderate-to-strong correlations between parents and teachers on six of the seven diagnosis-oriented subscales in their typically developing sibling sample. However, only four subscales in the autism sample showed significant correlations, all at low-to-moderate levels. According to Kaat et al. (2013), parent and teacher agreement on autism-related impairments and symptoms is poor to fair at best.

A more thorough examination of parent-teacher concordance suggests patterns in the way informants rate symptoms. Several studies report that parents rate their children as being more impaired. This has been shown for core symptoms of autism (Posserud, Lundervold, and Gillberg, 2006; Ronald, Happe, and Plomin, 2008), specific social (Murray et al., 2009) and behavioral (Nicpon, Doobay, and Assouline, 2010) challenges, as well as comorbid psychiatric symptoms such as those related to ADHD (Pearson et al., 2012). An exception is Jepsen's et al. (2012) study, which found that teachers rated children as being more impaired in social functioning than did parents. Item level analyses suggests that parents are more likely to use extreme rating categories (i.e., absent or regularly performed), whereas teachers are more likely to rate skills as emergent (Voelker et al., 2000). For example, Ryland, Hysing, Posserud, Gillberg, and Lundervold (2012) found that parents rated the item "bullied by other children" as "certainly true" significantly more than teachers. The authors suggested that parents perceive lack of friends or peer interactions as indicating the presence of bullying.

A majority of the studies in informant discrepancy compare parent and teacher report (as described above) or parent report compared to clinician observation. For example, parents may under-report the social skills deficits of children with autism compared to clinicians'

observations (Overton, Fielding, & Garcia de Alba, 2007). In a more recent study, Blacher, Cohen, and Azad (2014) showed that Anglo mothers reported more symptoms related to autism, but Latino children were observed by clinicians to display more symptoms related to autism. One limitation of these studies is that it did not use teacher report. It is unclear how these parent and teacher ratings compare with independent clinicians' observations. In summary, there are inconsistent findings in the literature regarding informant agreement, with studies reporting high, moderate, and low agreement between raters. There are also patterns in the way informants rate symptoms. However, there are no studies to our knowledge that compare parent and teacher ratings with clinical observations.

It is well-established that deficits in social skills are one of the signature markers for children with autism. Unfortunately, social functioning is not only difficult to define and measure, but it is also vulnerable to subjectivity. Therefore, it is not surprising that parents and teachers consistently disagree about the quality of social function (Dekkar, Nunn, and Koot, 2002; Jepsen et al. 2012; Tasse and Lacavalier, 2000). Characteristic social difficulties such as lack of peer relationships and unusual eye contact may be more evident in certain social situations than others, depending on the social dynamics (Ronald et al., 2008). Studies utilizing the Social Skills Rating Scale (Jepsen et al., 2012; Macintosh and Dissanayake, 2006; Vickerstaff, Heriot, Wong, Lopes, and Dossetor, 2007) and the Social Skills Q-Sort (Locke, Kasari, and Wood, 2014) suggest little convergence between parents and teachers. (However, it is important to note the context of these studies. For example, the Locke et al. (2014) study included a sample of children that were mainstreamed into general education.) More specifically, Murray et al. (2009) found that parents consistently rated their children as initiating interactions more than teachers did, whereas teachers consistently rated children as maintaining and responding to interactions more than parents did. Collectively, these studies suggest that it is difficult for informants to agree on social functioning, even though this is the hallmark characteristic of children with autism.

The severity of a child's autism symptoms may affect parent-teacher agreement. This idea first emerged in the 1990's when severity of autism was examined as a contributor to inter-rater agreement about adaptive behaviors in preschoolers (Hundert, Morrison, Mahoney, Mundy, and Vernon, 1997; Rapin et al., 1999; Voelker et al., 2000). These studies suggested that parent-teacher concordance (or lack thereof) may depend on whether children were low or high functioning. For example, Szatmari, Archer, Fisman, and Steiner (1994) reported low agreement between parents and teachers for high functioning preschoolers with PDD. More recently, several authors (Pearson et al., 2012; Voelker et al., 2000) raise the question of whether it may be particularly difficult to agree on the challenges faced by children who are less severely affected by autism. Therefore, symptom severity may serve as a moderate to informant agreement.

The present study examined parent and teacher concordance on a measure of social behavior for children with autism, and whether concordance varied as a function of symptom severity. Based on a review of the literature, we hypothesize that parents and teachers would show greater concordance for more severely affected children. Due to limited previous research, we did not hypothesize about whether parents or teachers ratings of social behavior would be more correlated with clinicians' observations of symptom severity.

Social functioning is a critical construct to measure because it is one of the most salient features of autism and consequentially, a frequent target for intervention. Examining whether parents and teachers agree on social functioning may facilitate assessments that are more efficient. Specifically, high congruency for a particular subsample of children with autism would provide confidence in using a single informant approach (and therefore save time) under the presumption that the second informant is likely to provide limited incremental information (Murray et al., 2009; Pearson et al., 2012). The additional time and burden to include the second informant would outweigh the benefit. Efficient assessment may in turn, expedite effective treatment planning and implementation for children with autism. Low congruency between raters would lend support for the necessity of multi-informants to develop a complete and reliable depiction of the child's social functioning across environments (Murray et al., 2009; Ronald et al., 2008). Such inter-rater inconsistencies would suggest that more time and resources be spent on interpreting conflicting assessment data and coming to a consensus about treatment targets.

Method

Participants

Data were taken from a randomized trial of a school-based intervention in a large, urban school district for children in kindergarten-through-second grade autism support classrooms (Mandell, Stahmer, Shin, Xie, Reisinger, and Marcus, 2013). In these classrooms, all children had an educational classification of autism. Teachers were recruited through individual visits to their classrooms by the research team and with letters sent through the district main office. The teachers sent the primary caregivers letters describing the study and asking them to complete a form giving the research team permission to contact them.

Of the approximately 500 students in these classrooms, 319 parents agreed to participate in the study. Of this group, 123 had teachers who completed the Social Responsiveness Scale at the beginning and end of the same academic year, resulting in a final sample size of 123 parent-teacher dyads. There were more male children (88%) than female children (12%) with an average age of 6.2 years ($SD = .9$). A majority of the children were Black/African American (50%) or White (25%). More than half of the parents reported obtaining either a high school degree/GED (40%) or college degree (18%); 29% reported an annual income of 40K or higher. There were 28 teachers, a majority of who were female (96%) and identified themselves as White (71%); 64% of the teachers had a master's degree.

Procedure

All procedures were approved by research review committees at the university and school district. At the beginning of the school year, children were assessed by research reliable clinicians using the Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore, and Risi, 2008) to confirm a diagnosis of autism. Parents and teachers completed the Social Responsiveness Scale (SRS; Constantino and Gruber, 2005) at the beginning (September) and end (May) of the school year for two consecutive years. Data were entered by research assistants who were not familiar with the parents, teachers, or assessment outcomes. During the school year, teachers received consultation to implement Strategies for

Teaching Based on Autism Research (STAR; Arick et al., 2004; Arick et al., 2003). The STAR curriculum combines three instructional approaches: discrete trial training (DTT), pivotal response training (PRT), and functional routines (FR) into a comprehensive curriculum.

Measures

Social Responsiveness Scale (SRS; Constantino et al. 2003). The SRS is a 65-item questionnaire designed for parents, teachers and caregivers to measure autistic social impairment across a variety of environmental settings. The SRS is designed to be completed in 15 minutes by an adult who has observed the child for at least two months in a naturalistic setting. Respondents are asked to rate each item on a 4 point likert scale (*1= Not true, 2= Sometimes true, 3= Often true, and 4= Almost always true*). Five symptom domain scales are generated from the measure (social awareness, social cognition, social communication, social motivation, and autistic mannerisms) as well as one total score used to measure severity of social impairment (Constantino, Gruber, David, Hayes, Passanante, Przybeck, 2004; Constantino and Todd, 2008). Scores on the SRS range from 0 to 195. Higher scores indicate greater social impairment. Raw scores were analyzed in the primary research and validation studies of the SRS, while *T*-scores are used more widely in clinical settings (Constantino and Gruber 2005). For the present study, we used the raw scores. When using raw scores for analyses, the SRS manual suggests a cutoff of 70 for males and 60 for females (sensitivity of .77 and specificity of .75) for screening any autism spectrum condition. A score of 85 from two separate informants lowers sensitivity but increases specificity to 90% for males and females (Constantino and Gruber 2005). Overall, the SRS shows strong internal consistency (Constantino, LaVesser, Zhang, Abbacchi, Gray, and Todd, 2007; Constantino et al., 2003; Constantino and Todd, 2003), test-retest reliability (Constantino et al. 2003; Constantino and Todd 2003; 2008) and inter-rater reliability (Pine, Luby, Abbacchi, and Constantino, 2006).

Autism Diagnostic Observation Schedule (Lord et al. 1999). The ADOS is a semi-structured, standardized, play-based observational assessment used to determine a categorical diagnosis of autism spectrum disorder. In research settings, administration of the ADOS must be done by a trained and reliable clinician rater. Verbal ability and developmental age are used to determine which one of four modules is appropriate for administration. Behavior is coded using a standardized protocol and codes are input into a diagnostic algorithm to identify subjects as typically developing, PDD-NOS, or autism. For the current study, we used the ADOS severity metric, developed by Gotham, Pickles, and Lord (2009). This revised ADOS severity algorithm allows for cross-module comparisons of symptom severity over time, and has been shown to be more highly correlated to the SRS than the original ADOS algorithm. Severity scores were based on percentiles of raw totals corresponding to each diagnostic classification. Children with scores between 1–5 are classified as less severely affected by autism and children with scores between 6–10 are classified as more severely affected by autism. This classification provides a method for quantifying symptom severity that is less influenced by individual characteristics, and is therefore, better than using ADOS raw total scores (Harker, Reisinger, Sherman, Xie, Shin, and Mandell 2010).

Data Analysis—The present study was designed to answer two research questions. First, we were interested in the extent to which parents and teachers agree on the SRS total and subscale scores at two points in time, and as a function of symptom severity. As mentioned previously, we dichotomized the ADOS symptom severity score into two variables: less severely affected by autism (scores 1–5) or more severely affected by autism (scores 6–10). For these two groups, we separately examined correlations between parent and teacher agreement on the SRS at the beginning and end of the school year. Our second question was the extent to which parent and teacher reports on the SRS corresponded with direct observations of symptom severity, as measured by the ADOS. To answer this question, we used linear regression with random effects for classroom. The dependent variable was SRS raw scores at the end of the school year. Our independent variables were severity score, rater (parent or teacher), as well as several covariates such as age, race, income, and education. All analyses were completed using SAS.

Results

For the first research question, we present correlations separately for more and less severely affected children with autism. For the two severity categories, we present correlations for the beginning and end of the school year. For the second research question, we present a visual description of Figure 1, following by the statistical results.

To what extent do parents and teachers agree on the SRS total and subscale scores based on symptom severity? For more severely affected children, teachers did not report a change in social functioning over the course of the school year. Parents reported a slight increase in social impairment. There was statistically significant agreement between parents and teachers on the SRS total scores at the beginning ($r = .28, p = .005$) and end ($r = .47, p < .0001$) of the school year. At the beginning of the school year for this group, there was a statistically significant correlation between parents and teachers for all SRS subscales, except mannerisms ($r = .16, p = .13$). At the end of the school year, agreement on all subscales was statistically significant.

For less severely affected children, both parents and teachers reported an improvement in social functioning over the course of the school year. Parent-teacher concordance on the SRS total scores was low at the beginning ($r = .14, p = .48$) and end ($r = .14, p = .46$) of the school year. At the beginning of the school year, there was no statistically significant correlation between parents and teachers on any of the SRS subscales. At the end of the school year, there was a statistically significant correlation between parents and teachers on the motivation subscale ($r = .39, p = .04$). The means and corresponding standard deviations for the SRS total and subscale scores, as well as the correlations between parents and teachers for more and less severely affected children, at both the beginning and end of the school year, are presented in Table 2.

To what extent do parent and teacher reports on the SRS correspond with direct observations of symptom severity, as measured by the ADOS? Figure 1 shows average parent and teacher ratings on the SRS as a function of symptom severity, which was measured by the ADOS severity algorithm. Visual inspection of Figure 1 suggests that parents and teachers follow

the same pattern of ratings (i.e., greater social impairment for more severely impaired children with autism). However, the variability of teacher report is greater (i.e., steeper slope) than the variability of parent report (i.e., flat slope). Therefore, it is the magnitude of the difference that varies by rater.

These observations were borne out in statistical analysis. In the linear regression, after adjusting for age, race, income, and education level, there was a main effect for symptom severity ($\gamma = 5.20$, $p < .0001$) and rater ($\gamma = -8.42$, $p = .01$). Since there were main effects, we examined the interaction between symptom severity and rater and found that it was statistically significant ($\gamma = -5.30$, $p = .003$). In other words, a one unit increase in ADOS symptom severity was associated with a 5.3-point greater increase in teacher SRS report than in parent SRS report. (This pattern of findings was true for the SRS measured at the beginning of the school year. Specifically, there was a significant symptom severity by rater interaction ($\gamma = -4.24$, $p = .014$.) We also conducted the linear regressions using the SRS subscales as the outcomes measure. A significant interaction between symptom severity and rater was found for awareness ($\gamma = -.88$, $p < .0001$), cognition ($\gamma = -.74$, $p = .009$), communication ($\gamma = -1.53$, $p = .059$), motivation ($\gamma = -.96$, $p < .0001$), and mannerisms ($\gamma = -1.19$, $p = .012$).

Discussion

In this study, parents and teachers agreed on the social deficits of more severely affected children at the beginning and end of the school year. However, they did not agree on the social deficits of less severely affected children at the beginning or end of the school year. Teachers' report of social behavior was correlated with direct observations of symptom severity, while parent report was not.

Consistent with our hypothesis, parents and teachers agreed on the SRS total score more for more severely affected children at the beginning and end of the school year. At the beginning of the school year, there was agreement between parents and teachers with regard to children's awareness, cognition, communication, and motivation. The only subscale on which parents and teachers did not agree was mannerisms. By the end of the school year, parents and teachers agreed on all five subscales of the SRS. In contrast, parents and teachers did not agree on the SRS total score for less severely affected children at the beginning or end of the school year; there was agreement only on the motivation subscale, and only at the end of the school year. These findings may help explain why some studies have found high agreement (Constantino et al., 2003) and others low agreement (Locke et al., 2014) on the SRS. For example, the Locke et al. (2014) study had as its sample children who were included with their typically developing peers in school, suggesting less severe impairment. The slight increase in agreement at the end of the school year may be due to increased exposure to child behavior or more home-school collaborations that allowed parents and teachers to compare and align their perspectives.

Our results are consistent with prior investigations which have shown that agreement is usually higher when the disorder is more severely impairing (Pearson et al., 2012; Rapin et al 1999). Parent-teacher agreement may be higher for more severely affected children

because these children have more obvious maladaptive behaviors that they exhibit at home and at school. Conversely, the behaviors of less severely affected children may be more context specific or open to interpretation.

Our second finding was that at the end of the school year, teachers' ratings of social deficits were associated with clinicians' observations of symptom severity, but parents' ratings were not. This was a robust finding because it appeared with the SRS total score, as well as all of the SRS subscales. Although parents and teachers followed the same pattern of ratings (i.e., greater social impairment for more severely impaired children with autism), the variability of teacher report was greater (i.e., steeper slope) than the variability of parent report (i.e., flat slope). This difference between parents and teachers may relate to differences in environmental demands or differences in informants' experiences (Achenbach, McConaughy, and Howell, 1987; Jepsen et al., 2012; Posserud et al., 2006; Renk and Phares, 2004; Ryland et al., 2009; Voelker et al., 2000).

If environmental demands are different across settings, parents and teachers may in fact observe the child exhibiting different behaviors at home and at school (Gadow and Drabick 2012; Kaat et al., 2013). Classroom structure may require more attention, organization, and behavioral inhibition than the home environment (Hartman, Rhee, Willcutt, and Pennington, 2007; Jepsen et al., 2012; Pearson et al., 2012). These demand characteristics may be more similar to the demands of the testing environment during the ADOS than are the demands at home. The classroom and testing environments are relatively inflexible; that is, the demands are the same regardless of the severity of the child. Such an inflexible environment may make social impairments more apparent than they are in the home environment, especially among more severely affected children. At home, parents may change the demand characteristics contingent on the severity of the child. There may be very low demands for more severely affected children and higher demands for less severely affected children. This adjustment of environmental demands may create an equilibrium, in which differences in social impairment are less apparent.

Another possible reason for the observed difference may be due to informants' experiences. Teachers and parents have different comparison samples to base their ratings. Specifically, teachers have more opportunities to observe many different children with autism in more socially taxing environments (Jepsen et al., 2012; Ryland et al., 2012). Our study took place in autism support classrooms, and therefore, teachers were rating students as compared to other children with autism. The teachers in our study were also receiving consultations on the STAR curriculum (which includes strategies for promoting social skills), and this experience may have biased their ratings. Similar to teachers, clinicians have prior experiences with children exhibiting a range of impairment. In contrast, parents typically observe fewer children with autism. They are likely to base their ratings in comparison to typically developing children (Ryland et al., 2012). Parents also share a deep emotional connection with their children, which may affect their ratings. In contrast, teachers may be able to take a more objective viewpoint. The broader set of experiences to which teachers and clinicians are exposed may make them better able to perceive a gradient in symptom severity.

Several study limitations should be noted. First, our study did not have a control group of children with other developmental disabilities, such as intellectual disabilities, to determine whether patterns of parent-teacher concordance generalize to other groups or are unique to autism samples. Further, our clinicians only conducted the ADOS at school. It is possible that parent-clinician agreement would be better if the ADOS was conducted at home. Due to the limited sample size of the teachers, we also could not determine whether differences between parent and teacher report of social behavior were due to differences in income, education, and/or race. For example, it is unclear whether Black/African-American parent-teacher dyads would be more aligned in their ratings than Black/African-American and Caucasian dyads. In addition, we only examined social behavior in autism support classrooms where teachers were receiving consultations on the STAR curriculum, and therefore, cannot make generalizations about whether the pattern of findings would hold true for other areas of impairment or settings. Finally, our assessments used the ADOS, and not the ADOS-2, which has a different scoring algorithm. The findings from the present study would be more robust if replicated in future research using the ADOS-2.

Implications

Despite these limitations, the findings from the present study have important implications for assessing and treating children with autism in schools. Pearson et al. (2012) urged investigators to determine whether there are subgroups of children for whom it is especially critical to have ratings from both parents and teachers. Our findings suggests that it may be more efficient to assess more severely affected children using a single-informant approach since parents and teachers show high concordance. For example, during the summer months (when it may not be feasible to obtain teacher ratings) parents may be confident about their assessment of social deficits and avoid an unnecessary delay in treatment (Pearson et al., 2012). To accurately assess less severely affected children, it may be necessary to invest more time and resources in order to obtain information from multiple informants. Future research may examine whether including or excluding one informant (based on symptom severity) impacts the efficiency of assessment and efficacy of intervention.

Although parents and teachers function in their unique settings, it may be important to provide them with similar opportunities on which to base their ratings. If parents observe children in school and teachers observe children at home, both informants would have a similar basis on which to rate behavior, and more importantly, a better understanding of the others' environment. It will be important for future investigators to verify whether allowing parents and teachers to observe the child across both environments improves inter-rater agreement.

Establishing a collaborative environment is the first step in creating opportunities for parents and teachers to learn from each other. For example, less severely affected children may be more capable than their family members think. Parents may learn from teachers about the best ways to provide appropriate challenges for these children. For more severely affected children, parents may have developed effective coping strategies that are beneficial for teachers. When parents and teachers have the opportunity to learn from each other, there will likely be more consistent intervention practices across home and school.

In addition to establishing a collaborative relationship between parents and teachers, it is equally important to facilitate parent-clinician agreement. For example, comprehensive psychoeducational reports should include home-based assessment and observation. Clinicians also may consider using multiple methods of assessment, reflecting both the structure of the classroom and the flexibility of the home environment. Improving the efficiency of multi-informant assessment and home-school collaboration is necessary to provide a more comprehensive, reliable depiction of social functioning that may ultimately determine the nature, cost, and intensity of interventions, and perhaps more importantly, improve outcomes for children with autism (Jepsen et al., 2012; Murray et al., 2009; Rapin et al., 1999).

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Figure 1.
End of the school year parent and teacher reporting on the SRS based on symptom severity

Table 1

Demographic characteristics

Variable	Percentage
Child Characteristics	
Male	88.0
Female	12.0
Age 5	30.1
Age 6	35.8
Age 7	23.0
Age 8	10.6
Asian/Pacific Islander	5.7
Black/African American	50.4
Caucasian/White	25.2
Hispanic/Latino	11.4
Other	7.32
Parent Characteristics	
1 st –8 th Grade	3.3
Some High School	5.7
High School or GED	39.8
Vocational/Technical	10.6
Some College	20.3
College Degree	17.9
Advanced Degree	2.4
Under 20,000	44.7
20,001 to 40,000	26.8
40,001 to 60,000	13.0
Over 60,000	15.5
Teacher Characteristics	
Male	4.0
Female	96.0
Black/African American	28.6
Caucasian	71.4
Bachelor's Degree	35.7
Master's Degree	64.3

Table 2
Mean values and correlations on the SRS total and subscales scores based on symptom severity

	Less Severely Affected						More Severely Affected					
	Beginning of Year			End of Year			Beginning of Year			End of Year		
	Teacher M (SD)	Parent M (SD)	r	Teacher M (SD)	Parent M (SD)	r	Teacher M (SD)	Parent M (SD)	r	Teacher M (SD)	Parent M (SD)	r
Total Score	73 (37)	84.8 (29.4)	.14	66.9 (26.6)	73.4 (26.9)	.14	99.5 (34.5)	83.6 (26.2)	.28**	99.6 (36.9)	86.6 (26.7)	.46***
Awareness	10.9 (4.5)	10.5 (3.6)	-.03	9.5 (3.4)	10.7 (2.8)	.03	13.4 (4.1)	11.3 (3.6)	.27**	13.3 (5.0)	11.2 (3.1)	.43***
Cognition	14.5 (6.3)	17.6 (5.4)	-.02	14.3 (5.6)	15.2 (4.9)	.08	19.5 (6)	16.5 (5.3)	.22*	19.3 (6.9)	17 (5.3)	.43***
Communication	26 (14.3)	28.3 (10.9)	.23	22.6 (11)	25.1 (10.8)	.06	34.5 (12.8)	28 (9.6)	.21*	34 (13.1)	29.8 (10.4)	.46***
Motivation	10.8 (6.4)	12.8 (6.5)	.19	9.3 (4.6)	10.7 (5.1)	.39*	16.2 (6.9)	13.5 (4.1)	.28**	15.4 (7)	13.4 (5.4)	.37***
Mannerisms	10.8 (9)	15.6 (6.6)	.08	11.1 (6.7)	11.7 (7.1)	.03	15.8 (8.5)	14.3 (6.4)	.15	17.6 (9.3)	15.2 (7.2)	.22*

*
p < .05;

**
p < .01;

p < .001