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The SPAIC-11 and SPAICP-11: Two Brief Child- and Parent-Rated Measures of Social Anxiety

Brian E. Bunnell, Ph.D.[a,b,c], **Deborah C. Beidel, Ph.D., ABPP**[a], **Liwen Liu, Ph.D.**[d], **Dana L. Joseph, Ph.D.**[a], and **Charmaine Higa-McMillan, Ph.D.**[e]

Brian E. Bunnell: bunnellb@musc.edu; Deborah C. Beidel: Deborah.Beidel@ucf.edu; Liwen Liu: liwenliu36@gmail.com; Dana L. Joseph: Dana.Joseph@ucf.edu; Charmaine Higa-McMillan: higac@hawaii.edu

[a]University of Central Florida, Orlando, FL

[b]Medical University of South Carolina, Charleston, SC

[c]Ralph H. Johnson VAMC, Charleston, SC

[d]American Institutes for Research, Washington, DC

[e]University of Hawai'i at Hilo, Hilo, HI

Abstract

The Social Phobia and Anxiety Inventory for Children-11 (SPAIC-11) and Social Phobia and Anxiety Inventory for Children's Parents-11 (SPAICP-11) were developed as brief versions of the Social Phobia and Anxiety Inventory - Child and Parent Versions via item response theory (IRT) using child and parent reports of social anxiety. A sample of 496 children was analyzed using IRT analyses, revealing 11 items that exhibit measurement equivalence across parent and child reports. Descriptive and psychometric data are provided for the child, parent, and combined total scores. Discriminant validity was demonstrated using logistic regression and receiver operating characteristic curve analyses. The SPAIC-11 and SPAICP-11 are psychometrically sound measures that are able to measure social anxiety invariantly across children and their parents. These brief measures which include combined parent and child perception of the child's social anxiety may provide notable benefits to clinical research.

Keywords

Assessment; Social Anxiety; Phobia; Child; Parent

Please address all correspondence to Brian E. Bunnell, Ph.D., College of Nursing, Medical University of South Carolina, 99 Jonathan Lucas St. MSC 160, Charleston, SC 29425; Office: 843.792.5146; bunnellb@musc.edu.

1 Introduction

1.1 Social Anxiety

Social anxiety disorder (SAD) is diagnosed typically during late-childhood to mid-adolescence (age 11 to 15; DeWit, Ogborne, Offord & MacDonald, 1999; Silverman et al., 1999; Weiss & Last, 2001), and is an intense fear and apprehension of social situations during which one might be evaluated, judged, or criticized by others (DSM-5; American Psychiatric Association [APA], 2013). SAD is marked by frequent avoidance of social situations (e.g., avoiding talking in front of the class and/or meeting new peers) and this pattern of apprehensive fear and avoidance of social situations creates significant functional impairment. Specifically, children with SAD tend to have fewer friends, poorer social relations and skills, academic problems, and elevated feelings of loneliness and school refusal (Beidel, 1991; Beidel, 1998; Beidel, Alfano, & Bunnell, 2013; Beidel, Turner, & Morris, 1999; La Greca & Lopez, 1998; Last, Hersen, Kazdin, Orvaschel, & Perrin, 1991; Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992).

1.2 The Social Phobia and Anxiety Inventory for Children

The Social Phobia and Anxiety Inventory for Children (SPAI-C; Beidel, Turner, & Morris, 1995) is an empirically derived self-report measure of social anxiety for children. The measure, intended for children and adolescents between the ages of 8 and 14, consists of 26 items rated on a 3-point Likert scale that reflect the frequency of social anxiety symptomatology in particular social situations. The SPAI-C provides a total score which ranges from 0 to 52, with a cutoff-score at or above 18 indicating probable SAD (Beidel et al., 1995). Although the SPAI-C does not provide specific subscale totals when calculating the total score, factor analyses have revealed specific factors in addition to an overall latent factor of social anxiety. Previous investigations have found evidence for initially a three- (Beidel et al., 1995), and later five- (Beidel, 1996; Storch, Masia-Warner, Dent, Roberti, & Fisher, 2004) factor structure for the measure. These factors measure the child's social anxiety as it relates to assertiveness, general conversation, public performance, physical/cognitive symptoms, and avoidance of social situations.

The SPAI-C has demonstrated excellent psychometric properties, including good internal consistency (Aune, Stiles, & Svarva, 2008; Beidel et al., 1995; Olivares, Sanchez-Garcia, Lopez-Pina, & Rosa-Alcazar, 2010; Storch et al., 2004) and test-retest reliability (Aune et al., 2008; Beidel et al., 1995; Olivares et al., 2010; Storch et al., 2004). A number of studies have also examined the validity of the SPAI-C, with results suggesting good construct, convergent, external, internal, and concurrent validity (Aune et al., 2008; Beidel, 1996; Beidel et al., 1995; Beidel, Turner, Hamlin, & Morris, 2000; Inderbitzen-Nolan, Davies, & McKeon, 2004; Kuusikko et al., 2009; Morris & Masia, 1998; Ogliari et al., 2012;; Storch et al., 2004). The SPAI-C has demonstrated excellent sensitivity and specificity to both diagnosis (Inderbitzen-Nolan et al., 2004; Kuusikko et al., 2009) and treatment effects (Gauer, Picon, Davoglio, da Silva, & Beidel, 2009). With regard to discriminant validity, the SPAI-C is able to effectively discriminate between children with and without a diagnosis of SAD (Beidel, 1996; Beidel et al., 2000; Beidel et al., 1995; Gauer et al., 2009).

1.3 The Parent Version of the SPAI-C

The parent version of the SPAI-C (SPAIC-PV; Beidel, Turner, & Morris, 2004) has been used in a number of investigations (e.g., Bunnell & Beidel. 2013; Higa, Fernandez, Nakamura, Chorpita, & Daleiden, 2006; Rork & Morris, 2009; Young, Bunnell, & Beidel, 2012) and consists of 26 items that have been adapted from the SPAI-C to reflect a parent's report of his/her child's anxiety (e.g., the SPAI-C item "I feel anxious when speaking to peers" is reworded as "my child feels anxious when speaking to peers" on the SPAIC-PV). Higa and colleagues (2006) examined the psychometric properties of the SPAIC-PV, finding adequate internal consistency and concurrent validity as well as modest support for a 3-factor model (i.e., assertiveness/general conversation, traditional social encounters, and public performance factors), rather than the traditional 5-factor model. Given the modest fit found for this three factor model, as well as questions regarding the parent's ability to accurately respond to some items (e.g., Item 24, which asks about the child's cognitive responses/worries during social interactions), further investigation into this measure may be warranted. Further, the SPAI-C and SPAIC-PV, although not unreasonable in length, do take approximately 20 to 30 minutes to complete, which may impede use of the measure in both practice and research where a shorter measure would be most practical for inclusion in a larger test battery. Most importantly, because no prior work has examined the measurement equivalence of the SPAI-C and SPAIC-PV, it remains unclear whether the SPAI-C and SPAIC-PV are assessing the same construct, in the same way across parents and children. The current investigation seeks to address these limitations (i.e., unclear factor structure, inappropriate parent items, relatively long length of the measures, and the need to establish measurement equivalence) by using item response theory (IRT) to develop abbreviated versions of the SPAI-C and SPAIC-PV that demonstrate measurement equivalence across both parent and child reports.

1.4 Item Response Theory

IRT models the relationship between respondents' observed scores and latent traits (Hulin, Drasgow, & Parsons, 1983), and ideal items are those that discriminate among respondents (e.g., the item can discriminate between high and low anxiety individuals such that those with high anxiety endorse the item whereas individuals with low anxiety do not) and exhibit low differential item function (DIF). DIF occurs when the probability of endorsing an item differs across groups of respondents who have the same standing on the latent trait (e.g., a parent and a child may respond differently to an item assessing the child's anxiety despite having similar beliefs about the child's actual levels of anxiety; Raju, van der Linden, & Fleer, 1995). In order to develop a brief version of the SPAI-C that can be used for both parent and child reports, the current paper uses IRT (as opposed to traditional scale development procedures, or classical test theory [CTT]) because IRT offers a more "psychometrically sound" assessment of DIF (Raju & Ellis, 2002, p. 157) than CTT. This is of particular importance in the current paper where we seek to develop a measure that is invariant across child and parent reports (i.e., displays low parent-child DIF).

1.6 Development of the SPAIC-11 and SPAICP-11

Because we sought to create equivalent parent and child report measures, we started the scale-shortening process by removing items from the SPAI-C and SPAIC-PV that exhibit DIF, and then we examined the remaining items for their ability to discriminate between high and low anxiety children. Ultimately, this process allowed us to shorten the scale while maintaining items that measure child anxiety equivalently across the SPAI-C and SPAIC-PV. The psychometric properties of the resulting brief versions of the SPAI-C (i.e., the SPAIC-11) and the SPAIC-PV (i.e., the SPAICP-11) were also examined, including discriminant validity, and sensitivity and specificity. These abbreviated scales will allow clinicians to functionally compare parent and child scores; without this, any differences in parent and child scores may be misinterpreted as meaningful, when in fact, these differences may have been caused by measurement nonequivalence. Further, a measure that is as equally valid as the SPAI-C, but takes less time to complete will be advantageous during the assessment process.

2 Method

2.1 Participants

The current investigation used participant data gathered from previous investigations (i.e., n = 243 from Beidel et al., 2007; n = 158 from Higa et al., 2006) as well as ongoing investigations and patient data collected at a university anxiety clinic in the South-Eastern United States (n = 95). Participants from Beidel et al. (2007) were treatment seeking children with SAD who participated in a pre-treatment assessment and were subsequently invited to participate in a randomized controlled trial. Participants from Higa et al. (2006) were recruited from a community sample seeking to validate the SPAIC-PV, and the remaining participants included both treatment seeking children with SAD and children with no psychiatric diagnosis who were recruited as part of ongoing investigations, or presented at the clinic seeking services for SAD at our research clinic.

Participants with missing data were excluded from the current study, yielding a final sample of 496 child self-ratings on the SPAI-C and 378 parent-reports of child social anxiety on the SPAIC-PV. A subsample of children and their parents (n = 307) were administered a diagnostic interview affirming either a diagnosis of SAD (n = 247) or no diagnosis (ND; n = 60). This sample was used for analyses examining discriminant validity of SPAIC-11 total scores. Children in these two groups did not differ significantly in age or sex. Chi-square results did reveal significant differences in race ($\chi^2[1, 5] = 25.621$, $p < .001$, $\Phi = .289$), although this may be expected given the large differences in sample size. Participant demographics for the overall sample and this subsample are displayed in Table 1.

2.2 Assessment Measures

2.2.1 Child- and Parent-Report—The SPAI-C and SPAIC-PV consist of 26 items which assess the frequency of anxiety symptoms during particular social situations. Participants rated each item using a 3-point Likert scale (0 = Never, or Hardly Ever, 1 = Sometimes, and 2 = Most of the Time, or Always). Responses for items with multiple response options were averaged and the mean score was rounded to an integer to facilitate the IRT analysis.

2.2.2 Diagnostic Interview—The Anxiety Disorders Interview Schedule for Children – Parent/Child Version (ADIS-C/P; Silverman & Albano, 1994) is a semi-structured diagnostic interview for childhood disorders. The ADIS-C/P was administered to both parents and their children and composite diagnoses were based on information provided by both informants.

2.3 Analyses

2.3.1 IRT & DIF Analyses—To check the unidimensionality of the data to meet the assumption of IRT models, we conducted a series of confirmatory factor analyses (CFA) using MPlus 7 (Muthén & Muthén, 2012) on the ratings from children and parents. Because the data were categorical in nature, MPlus used weighted least square parameter estimation by default. If the unidimensional model showed acceptable fit, and also superior fit to the three- and five-factor model suggested in the previous studies (Beidel et al., 1995; Beidel, 1996) based on the fit indices such as the Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA), then the unidimensionality assumption was met. The discrimination and threshold parameters were then estimated for each item for the reference group (i.e., child's ratings) and the focal groups (i.e., parent's ratings). Because the SPAI-C and SPAIC-PV involve responses with multiple categories (i.e., they are polytomous), we used Samejima's Graded Response Model (SGRM; Samejima, 1969) to model the discrimination and threshold parameters using MULTILOG 7.03 (Thissen, Chen, & Bock, 2003). These parameters served as the input for the subsequent DIF analysis. In our study we used Raju et al.'s differential functioning of items and tests (DFIT) framework, and specifically, the NCDIF (noncompensatory DIF) index to identify both uniform and nonuniform DIF items. In this framework, each respondent's true score on item *i* is first estimated as if the respondent were from the reference group (e.g., child) and then the true score on the same item is estimated again as if the respondent were from the focal group (e.g., parent). After the difference of these two true scores is obtained, the expectation of the squared differences is calculated. This NCDIF index is then compared to a cutoff value to indicate whether the item has DIF or not. Baker's (1995) EQUATE 2.1 was used to translate the item parameters from the reference and the focal groups on a common scale and the NCDIF index was obtained for each item using the DFIT software (Raju, 1999). The DIF items were detected by comparing the NCDIF index of each item with the cutoff score. The regression-based cutoff value, which is a composite of sample size, scale length, number of response options, and their interactions (Tay, Nye, & Drasgow, 2010) was used for the current analyses. Items with significant DIF were removed from both the SPAI-C and SPAIC-PV to create the shortened scales (i.e., the SPAIC-11 and the SPAICP-11). After the high DIF items were removed, all remaining items were evaluated for their discrimination parameters individually and as a whole set to ensure the items discriminated between high and low anxiety children and provided information across the full latent trait spectrum.

2.3.2 Descriptive Data—Descriptive data and analyses for the discriminant validity of the shortened scales were derived from the subsample of children with diagnostic data (n = 307). Total scores for the SPAIC-11 (i.e., Child) and SPAICP-11 (i.e., Parent) were calculated by summing responses on the final measure items for the child and parent

versions and the child-parent Combined Score (i.e., child and parent) was calculated by averaging SPAIC-11 and SPAICP-11 Scores.

2.3.4 Discriminant Validity—Logistic regression was used initially to predict group membership (ND vs SAD) based values of the SPAIC-11, SPAICP-11, and Combined Score using SPSS 21.0 (IBM Corp., 2012). Diagnosis was coded as either 0 (ND) or 1 (SAD) and entered as a dependent binary variable, and the three Total Score variables were entered as predictors separately.

2.3.5 Sensitivity and Specificity—Receiver operating characteristic (ROC) curve analyses were conducted to examine the sensitivity (true positive rate) and specificity (false positive rate) of the three SPAIC-11 total scores to diagnosis as well as to establish optimal cutoff scores for probable SAD while maximizing these psychometric values. ROC curve analyses were conducted using SPSS 21.0 with diagnosis coded as either 0 (ND) or 1 (SAD) and entered as a dependent binary variable with total scores as predictor variables.

3 Results

3.1 IRT & DIF Analyses

The results of CFA supported unidimensionality of the scale for both the child ratings and parent ratings. For the unidimensional model, CFI = 0.917, TLI = 0.910 and RMSEA = 0.081 for the child's ratings, and CFI = 0.966, TLI = 0.963, and RMSEA = 0.103 for parent's ratings. These provided acceptable fit for item-level categorical data. The three- and the five-factor model showed a much worse fit than the unidimensional model for both the parent's and child's ratings. For the three-factor model, CFI = 0.588, TLI = 0.552 and RMSEA = 0.180 for the child's ratings, and CFI = 0.585, TLI = 0.549, and RMSEA = 0.358 for parent's ratings. For the five-factor model, CFI = 0.549, TLI = 0.496 and RMSEA = 0.191 for the child's ratings, and CFI = 0.570, TLI = 0.520, and RMSEA = 0.369 for parent's ratings. After confirming the unidimensionality of the data for both ratings, IRT analyses were conducted to obtain estimated item parameters (see Table 2). All *a*- and *b*-parameters were within the normal range for the child and parent ratings. Moreover, the mean *a*-parameter was larger for the parent rating (M = 1.489) than the child ratings (M = 1.027).

Table 3 shows the DFIT indices of each item. A cutoff value derived from the regression method described in Tay et al. (2010) was used. In this study, the regression-based cutoffs were developed by conducting simulations and examining how DFIT behaved under different conditions. The simulation results were then used to estimate a regression model that determines what the DFIT cutoff should be, given the number of response options, the sample size, and length of scale. Based the cutoff value of 0.009 derived from this regression model, 15 items were flagged as DIF items. In order to obtain shortened scales that functioned equivalently across parent and child reports, we removed all items that displayed significant DIF (i.e., items 1, 2, 5, 6, 7, 8, 9, 18, 19, 20, 21, 22, 24, 25, and 26 were removed). The remaining items were all highly discriminating and provided information across the full latent trait spectrum (see Table 2), so no additional items were

removed. Thus, the shortened scales, which we refer to as the SPAIC-11 and SPAICP-11, consisted of 11 items (i.e., items 3, 4, 10, 11, 12, 13, 14, 15, 16, 17, and 23).

3.2 Descriptive Data

Means and standard deviations on the SPAIC-11, SPAICP-11, and Combined Score are displayed in Table 4. The measures demonstrated good internal consistency (Cronbach's α = .897 for the SPAIC-11 and .918 for the SPAICP-11). Children with no diagnosis scored significantly lower than children with a diagnosis of SAD on the SPAIC-11 (F[1,305] = 45.00, p < .001, d = −2.33), SPAICP-11 (F[1,206] = 119.497, p < .001, d = −2.47), and Combined Score (F[1,206] = 86.61, p < .001, d = −1.73). Female children scored significantly higher than male children on the SPAIC-11 (F[1,305] = 11.78, p = .001, d = 0.36) and the Combined Score (F[1,206] = 7.05, p = .009, d = 0.37), but not on the SPAICP-11. Children did not differ on scores with respect to race/ethnicity (all ps > .05). Scores on the SPAIC-11 and SPAICP-11 did not differ significantly for parent-child dyads in the ND group, t(29) = .128, p = .899, Cohen's d = .02, r = .24. Scores on the SPAICP-11 were higher for SAD group, t(178) = .−10.71, p < .001, Cohen's d = .96, r = .29.

3.3 Discriminant Validity

The results of the logistic regression analyses predicting diagnosis from SPAIC-11, SPAICP-11, and Combined Score are displayed in Table 5. All scores predicted membership to diagnostic category significantly (all p's < .001), with the SPAICP-11 and Combined Score accounting for a larger proportion of the variance (R^2_{Nag} = 0.505 & 0.466 for SPAICP-11 and Combined Score, respectively) in comparison to the SPAIC-11 (R^2_{Nag} = 0.205). These results suggest that these total scores are able to predict a child's diagnosis (SAD vs ND) differentially.

3.4 Sensitivity and Specificity

The results of all ROC curve analyses were significant (all p's < .001). The AUC was fair for the SPAIC-11 (AUC = 0.739, SE = .048, 95% CI = 0.645–0.833). The AUC was good for the SPAICP-11 (AUC = 0.892, SE = .035, 95% CI = 0.823–0.962) and the Combined Score (AUC = 0.889, SE = .032, 95% CI = 0.825–0.953). The examination of the coordinate points of the ROC curve suggested optimal (i.e., maximized sensitivity and sensitivity) cutoff scores of 9 (exact score value = 9.167) for the SPAIC-11 (Sensitivity = 0.702, Specificity = 0.700), 13 (exact score value = 13.167) for the SPAICP-11 (Sensitivity = 0.831, Specificity = 0.833), and 11 (exact score value = 10.917) for the Combined Score (Sensitivity = 0.826, Specificity = 0.833).

4 Discussion

The purpose of the current study was to create abbreviated measures of the SPAI-C and SPAIC-PV that assess social anxiety in children equivalently across both parent and child reports. Differential item functioning was estimated to remove items from the SPAI-C and SPAIC-PV that did not display measurement equivalence across parent and child reports. The remaining 11 items created the SPAIC-11 and SPAICP-11. All retained items adequately discriminate between those who are high on social anxiety and those who are

low on social anxiety and appear to measure the same construct, in the same way, across parent and child versions of the measure. Moreover, results suggest the SPAIC-11 and SPAICP-11 are accurate predictors of diagnostic category and are adequately sensitive and specific measures of social anxiety in children. The correlation between parent and child scores is similar to the magnitude of parent-child correlations in prior work (Birmaher et al., 1997). Mean differences were observed between parent and child reports for the SAD, but not the ND group. This might be expected as children who experience social anxiety may under-report symptom severity (to providers and to parents), which in turn may lead parents to make assumptions based on observation; whereas children with minimal anxiety may be less likely to withhold communication about their anxious thoughts, leading to fewer parent-child differences.

As stated earlier, the current study used a fairly robust approach to the development of the SPAIC-11 and SPAICP-11 through the use of item response theory. In general, the IRT approach offers several advantages over traditional scale-shortening techniques based on classical test theory (e.g., an examination of item-total correlations), including invariance of item parameters and calculation of conditional standard errors of measurement (Hulin et al., 1983). In the current paper, we estimated differential item functioning to insure that items included in the final measure assess social anxiety equivalently across parents and children. Ultimately, the creation of the SPAIC-11 and SPAICP-11 (and their associated diagnostic cutoff scores) not only provides clinicians and researchers with a measure of social anxiety in children that is more practical for use when administration length is a concern, but it also allows for more reliable conclusions to be drawn from the use of parent-reported anxiety in children, given the results that suggest the SPAICP-11 displays measurement equivalence with the SPAIC-11.

How would a clinician decide whether to use the original SPAI-C/SPAIC-PV vs. the 11 item versions? The answer will in some cases depend upon its intended use. Shortened versions of the original measures, such as the SPAIC-11 and the SPAICP-11, that retain the original instruments' psychometric properties may be very useful for screening and preliminary identification of children who are suffering from social anxiety. Thus, in school or clinical environments where there is a need for a short assessment, these new versions may be quite useful. The original versions retain their usefulness for treatment planning purposes. Furthermore, despite the lack of congruence between parent and child on items such as cognitions and somatic symptoms, knowledge of the existence of these symptoms may be critically important for determining the most appropriate treatment approach and for evaluating treatment outcome.

Despite the potential utility of the SPAIC-11 and its parent-reported counterpart, the SPAICP-11, the current paper has several limitations/areas for future analysis. First, although we found evidence for measurement equivalence across parent and child reports of anxiety, future research is needed to examine whether the items function equivalently across gender, race, age, and diagnostic category. Second, additional work should address how the SPAIC-11 and SPAICP-11 respond to treatment interventions and whether treatment changes how children and their parents interpret the items on the measure. Third, although the analyses included in this investigation were able to demonstrate discriminant validity

between children with ND and SAD, it is unknown how this measure will perform when discriminating between children with SAD and other diagnoses. Finally, this study used existing data from the original SPAIC and SPAIC-PV measures. As a result, the SPAIC-11 and SPAICP-11 has yet to be administered in its current form and will require further investigation to determine whether the measure performs psychometrically as well as it did in the current study.

In conclusion, while additional validation of the SPAIC-11 and SPAICP-11 is necessary, initial results suggest several psychometric strengths of the measure, including (a) brevity, (b) measurement equivalence with parent-reported child anxiety using the SPAICP-11, (c) established cutoff scores, and (d) sensitivity and specificity in predicting diagnostic category. This abbreviated measure is especially valuable as clinical test batteries increase in length while the corresponding need to assess social anxiety in children becomes increasingly important in order to administer early treatment. Further, in reducing the administration time of the SPAI-C and SPAIC-PV from 20–30 minutes to approximately 10–15 minutes with the SPAIC-11 and SPAICP-11, these measures show promise for use as brief measures of social anxiety in children that maintain the psychometric properties and criterion-related validity of the longer measures.

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Highlights

- The SPAIC-11 and SPAICP-11 were developed using Item Response Theory
- Social anxiety is measured invariantly across parent and child report
- The abbreviated measures are psychometrically sound

Table 1

Participant Demographics

		Subsample for Discriminant Validity Analyses		
	Overall Sample (*n* = 496)	**ND (*n* = 60)**	**SAD (*n* = 247)**	**Overall (*n* = 307)**
Age M(*SD*)	**11.30 (2.47)**	**11.83 (3.22)**	**11.58 (2.77)**	**11.63 (2.86)**
Sex		*n* (%)		
Male	228 (46.0)	29 (48.3)	111 (44.9)	142 (46.3)
Female	268 (54.0)	31 (51.7)	136 (55.1)	165 (53.7)
Race				
Black	59 (11.9)	15 (25.0)	41 (16.6)	56 (18.2)
American Indian/Alaskan	12 (2.4)	0 (0.0)	2 (0.8)	2 (0.7)
Asian/Pacific Islander	84 (16.9)	1 (1.7)	9 (3.6)	10 (3.3)
White	214 (43.1)	23 (38.3)	163 (66.0)	186 (60.6)
Latino/Latina	97 (19.6)	9 (15.0)	20 (8.1)	29 (9.4)
Bi-racial/Other	30 (6.0)	12 (20.0)	12 (4.9)	24 (7.8)

Note. ND = No Diagnosis; SAD = Social Anxiety Disorder; M = Mean; *SD* = Standard Deviation.

Table 2

IRT Item Parameter Estimates for Child and Parent Ratings

	Child's Self-Ratings			Parent's Ratings of the Child		
Item	**a**	**b_1**	**b_2**	**a**	**b_1**	**b_2**
1	1.022	−0.906	1.004	1.991	−0.869	0.197
2	0.702	−1.399	0.601	1.656	−0.985	0.103
3	0.937	−0.957	0.731	1.719	−0.964	0.236
4	0.801	−1.090	0.445	1.491	−1.212	0.078
5	0.932	−0.038	1.565	1.577	−0.535	0.654
6	0.843	0.349	1.906	1.193	0.271	1.233
7	0.816	−0.554	1.467	1.838	−0.462	0.636
8	0.814	−0.064	1.650	1.241	−0.603	0.582
9	1.066	−0.329	2.300	1.933	−0.109	1.129
10	1.226	−0.778	1.096	1.413	−0.922	0.627
11	1.155	−0.715	1.225	1.340	−0.839	0.787
12	1.288	−0.986	0.805	1.893	−1.113	0.296
13	1.110	−0.587	1.322	1.376	−0.819	0.742
14	1.575	−0.474	1.600	1.954	−0.532	0.846
15	1.345	−0.397	1.488	1.877	−0.533	0.955
16	1.103	−0.762	0.639	1.879	−0.927	0.289
17	1.007	−0.927	0.636	1.418	−0.913	0.286
18	0.993	−0.937	0.823	1.435	−1.151	0.009
19	0.994	−0.518	1.437	1.459	−0.318	0.840
20	0.902	−0.157	1.941	1.345	−0.123	1.185
21	1.313	−0.671	1.072	1.371	−0.370	0.703
22	0.897	−0.022	1.659	0.906	0.264	1.979
23	0.734	−0.817	0.901	1.215	−0.717	0.393
24	1.185	−0.437	1.156	1.336	−0.291	0.811
25	0.974	0.245	2.380	0.919	0.671	2.819
26	0.977	0.461	2.767	0.929	1.189	3.137

Note. The *a*-parameters do not include the scaling constant of 1.7.

Table 3

DIF Items

Item	Parametric IRT DIF (NCDIF)
1	**0.023**
2	**0.019**
3	0.005
4	0.007
5	**0.029**
6	**0.010**
7	**0.018**
8	**0.045**
9	**0.035**
10	0.003
11	0.002
12	0.007
13	0.006
14	0.001
15	0.000
16	0.002
17	0.000
18	**0.045**
19	**0.017**
20	**0.010**
21	**0.028**
22	**0.067**
23	0.004
24	**0.019**
25	**0.063**
26	**0.085**

Note. Bold numbers indicate the items were flagged as DIF items.

Table 4

Total Scores Based on Participant Demographics

	SPAIC-11 M (*SD*)	SPAICP-11 M (*SD*)	Combined Score M (*SD*)
Diagnosis			
ND	7.54 (4.17)^a	7.55 (5.58)^a	7.62 (4.10)^a
SAD	12.12 (4.87)^a	16.30 (3.74)^b	14.20 (3.49)^b
Sex			
Male	10.17 (5.03)^a	14.82 (5.18)	12.45 (4.08)^a
Female	12.13 (4.94)^b	15.23 (5.01)	14.00 (4.31)^b
Race/Ethnicity			
Black	9.91 (5.03)	15.07 (4.57)	13.12 (4.01)
American Indian/Alaskan	15.16 (3.53)	18.00 (2.83)	16.58 (3.18)
Asian/Pacific Islander	13.43 (4.61)	16.03 (6.24)	14.73 (5.04)
White	11.44 (5.05)	15.03 (5.10)	13.12 (4.24)
Latino/Latina	12.04 (5.60)	14.57 (6.10)	13.41 (4.96)
Bi-racial/Other	10.44 (4.45)	14.69 (4.27)	13.00 (3.68)

Note. ND = No Diagnosis; SAD = Social Anxiety Disorder; M = Mean; *SD* = Deviation;

^{a,b} = sub-groups (e.g., Diagnosis and Sex) differ significantly from their respective category.

Table 5

Logistic Regression Predicting Diagnosis from Total Scores

Measure	β	SE	Wald	Sig.	OR	95% CI	R^2_{Nag}
SPAIC-11	0.206	0.036	33.676	<0.001	1.229	1.146–1.318	0.205
SPAICP-11	0.352	0.055	40.321	<0.001	1.421	1.275–1.584	0.505
Combined Score	0.442	0.074	36.081	<0.001	1.555	1.346–1.796	0.466

Note. β = Standardized Logistic Regression Coefficient; SE = Standard Error; Wald = Wald Statistic; Sig. = level of significance; OR = Odds Ratio; 95% CI = 95% Confidence Interval; R^2_{Nag} = Nagelkerke's R Square.