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The Child Anxiety Impact Scale (CAIS): Examining Parent- and Child-reported Impairment in Child Anxiety Disorders

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Abstract

Objective—The purpose of the current investigation was to examine the factor structure, reliability, and construct validity of both the Child and Parent version of the Child Anxiety Impact Scale (CAIS) using data obtained from the Child/Adolescent Anxiety Multimodal Study (CAMS; Walkup et al., 2008).

Method—The CAIS child and parent versions measure anxiety-related functional impairment in school, social and family domains. Participants were 488 children ages 7 to 17 (mean age 10.7; SD=2.8 years) enrolled as part of the CAMS study across 6 sites and their primary parent or caregiver. Families participated in a structured diagnostic interview and then completed the CAIS along with other measures.

Results—Confirmatory factor analysis revealed that the a priori three factor structure (school, social, and home/family) for the CAIS parent- and child-report was a reasonable fit, with a Comparative Fit Index (CFI) of .88 and Root Mean Square Error of Approximation (RMSEA) of . 05. Internal consistency was very good for total score and subscales of both versions of the scale (Cronbach's alpha ranged from = .70–.90). The CAIS total scores demonstrated good construct validity, showing predicted significant correlations with the CBCL Internalizing Scale, the MASC and SCARED Total Scores, the PARS and the CGAS. In addition, CAIS Social and School subscales were significantly related to similar subscales on the CBCL, SCARED, and MASC.

Conclusions—The results provide support that the CAIS is a reliable and valid measure for the assessment of the impact of anxiety on child and adolescent functioning.

Anxiety disorders are among the most common mental health conditions affecting youth, with an estimated prevalence of 10%–20% (Costello, Egger, & Angold, 2005). Studies suggest that anxiety disorders often begin early in childhood, typically run a chronic, fluctuating course into adulthood, and confer significant risk for continued anxiety, subsequent depression, suicidality, substance abuse, and psychiatric hospitalization (Costello, Egger & Angold, 2005; Goldstein, Olfson, Wickramaratne, & Wolk, 2006; Kendall, 2004; Pine et al., 1998). Prospective studies demonstrate that, among adults with anxiety or depression, as many as half report histories consistent with one or more child anxiety disorders (Kessler et al., 1994). The symptoms of these disorders are concerning not only because of their continuity over time, but because of the tremendous interference they cause in the daily lives of affected children and adolescents. This interference occurs in multiple areas of functioning including academic, social, and family domains, and it can derail the normal developmental trajectory with lasting effects (Ialongo et al., 1995; Langley

et al., 2004). Given their high prevalence rates and potential morbidity, it is clear that child anxiety disorders constitute a significant burden to the mental health care system. As such, efforts to better understand anxiety disorder symptoms and to adequately capture their associated impact remains important.

Critical scientific advances in the understanding and treatment of child and adolescent anxiety disorders have been made over the course of the last two decades, including the development and proliferation of psychometrically sound, multi-informant, anxiety-specific symptom measures and empirically-supported psychosocial (James, Soler, & Weatherall, 2005; Kendall et al., 1997; Walkup et al., 2008) and psychopharmalogical (Dielemen & Ferdinand, 2008; Walkup et al., 2008) interventions. To date, work in this area has largely focused on linking evidence-based treatments to reductions in anxiety symptom severity, with a variety of measures offering global assessment of anxiety disorder symptoms. However, although the topic of impairment is integral to the conceptualization, diagnosis, assessment, and treatment of anxiety disorders, there has been less emphasis on functional impairment outcomes. This neglect may, in part, stem from a dearth of research on the degree to which and the ways in which anxiety interferes in daily functioning and development (Kutash, Lynn, & Burns, 2008). The neglect is also concerning because functional interference is a key component for meeting diagnostic criteria (Diagnostic and Statistical Manual-Fourth Edition (DSM-IV; APA, 1994), thus impacting the very definition of which youth may require treatment, as well as the categorization of treatment responders versus treatment refractory individuals.

Anxiety-related impairment can manifest as difficulties and disabilities in virtually every domain of child and adolescent functioning. Anxiety-related symptoms have the capacity to interfere with functioning across social, academic, and familial domains. For example, separation anxiety interferes with school attendance and the development of autonomous peer relationships. Excessive worry and intrusive thoughts impair focus and concentration and interfere with academics: social anxiety may preclude initiating/maintaining friendships, developing dating relationships, and even attending family events (Langley, Bergman, Piacentini, & McCracken, 2004). The range of anxiety disorder symptomatology and the correspondingly diverse manifestations of impairment underscore the need for assessing the functional impact of anxiety symptomatology. Such assessments would facilitate the identification and tracking of functional targets over the course of treatment.

Early research in this area focused on impairment at a global level. For example, Bernstein (1991) reported that children with anxiety disorders and comorbid depression may be particularly vulnerable to impairment, and Steinhausen et al. (2001) reported that girls with anxiety disorders reported significantly higher global impairment than their male counterparts. Others have reported links between specific anxiety disorders and more severe global impairment, suggesting that children with panic disorder and social phobia are more negatively impacted than youth with other anxiety disorders (Beidel, 1991; Last et al., 1992).

Very few studies have linked anxiety disorder symptomatology to specific domains of impairment (i.e., disrupted functioning), an omission that is concerning given the

heterogeneous manner in which anxiety disorders present. Strauss et al. (1988) found that anxiety disordered children received lower social impact scores, were less liked, and more socially neglected on measures of peer status, while others reported anxious youth to be rated by their teachers as having higher levels of social and academic impairment compared to unaffected peers (Benjamin et al., 1990; Chansky & Kendall, 1997). Although these findings highlight the impact of anxiety on global scholastic and interpersonal functioning, a more detailed understanding of anxiety-related impairment in these and other functional domains (e.g., family, daily activities) requires additional research.

Kutash, Lynn, and Burns (2008) described five measures of global impairment with adequate psychometric properties, four of which required interviewer administration. The exception was the self-report Youth outcomes Questionnaire (Wells, Burlingame, & Rose, 2003). More recently, Whiteside (2009) reported good reliability and validity for a three item adaptation of the Sheehan Disability Scale (Sheehan, 1986) which children and parents use to rate the degree to which the child's symptoms interfere with functioning at school/work, with friends, and at home (using a 0–10 scale). Although the existing measures are useful indicators of overall impairment, the lack of detail regarding specific areas of interference limits their utility to capture the breadth and depth of interference, inform intervention targets, and evaluate change over the course of treatment.

There remains a need for a developmentally sensitive indicator of specific impairments for anxious youth. Accurate assessment of impairment would place symptom expression into functional terms and provide information that may not be easily accessible via assessment of diagnostic symptoms. Such information has utility for defining treatment goals and tracking progress. It can also be used to enhance treatment motivation and compliance when patients deny the consequence of symptoms (Piacentini & Bergman, 2000). Importantly, measures of functional impairment place the burden of disorder in real world terms and provide benchmarks to assess quality of life following treatment.

Langley et al. (2004) developed the Child Anxiety Impact Scale for Parents (CAIS-P). The CAIS-P is a parent-report measure that provides a standardized format for assessing the impact of anxiety on psychosocial functioning. It provides a quantitative measure of anxiety-related functional impairment related to specific situations from multiple psychosocial domains (School, Social, Home/Family). It was designed as both a baseline measure and to evaluate treatment response.

Although the CAIS-P addresses some of the delivery concerns highlighted in earlier reviews (e.g., Kutash et al., 2008) and demonstrates utility in descriptive research, further psychometric work is needed. Importantly, the child self-report version has yet to be evaluated despite its potential for valuable child-report information (Whiteside, 2008). In fact, prior research indicates that parents and children have been found to vary in the contexts (i.e., within home versus out of home) within which they base their anxiety symptom reports (Comer and Kendall, 2004; De Los Reyes, Aldao et al., 2012). Thus, utilizing a multi-informant approach to the assessment of child anxiety impairment may be particularly important, with the child and parent reports allowing a venue for assessing context-specific expressions of children's anxiety-related impairment. In addition, the factor

structure of the CAIS-P has yet to be confirmed. Items were initially sorted into three subscales (Social, Family/Home, and School) based on a priori theoretical judgments.

The current study examined the factor structure of both the parent- and the child-report CAIS using data obtained from the Child/Adolescent Anxiety Multimodal Study (CAMS; Walkup et al., 2008) study. CAMS was a large, multi-site randomized clinical trial investigating the relative efficacy of cognitive-behavior therapy (CBT), medication (sertraline; SRT), and their combination (COMB), as compared to pill placebo (PBO) for 488 youth with primary separation anxiety (SAD), social anxiety (SP), or generalized anxiety disorder (GAD) (Compton et al., 2010; Kendall et al., 2010). In addition, we present reliability and construct validity data derived from the empirically-based factor structures identified.

It was predicted that the CAIS total impairment score would be positively correlated with CBCL Internalizing T score, MASC total scores, SCARED total scores, diagnostician's clinical severity ratings (CSRs), and PARS Total Child and Parent scores, negatively correlated with Children's Global Assessment Scale (CGAS), and not significantly related with CBCL Externalizing scores. Additionally, it was hypothesized that the CAIS factors related to social impairment would be positively related to the Social Anxiety subscales of the MASC and the SCARED. Exploratory analyses examined the relationship between CAIS scores and demographic variables, including gender, age, ethnicity, SES, and medication status.

Method

Participants

Participants were 488 children ages 7 to 17 (mean age 10.7; SD=2.8 years) enrolled as part of the CAMS study across 6 sites (for details on the CAMS study see Compton et al., 2010, Kendall et al., 2010 and Walkup et al., 2008) and their primary parent or caregiver. The study included an even sample of boys and girls (49.6% girls). Seventy nine percent of the sample identified themselves as Caucasian, with 9% of the participants identifying themselves as African American, 3% as Asian or Pacific Islander, 1% as American Indian, and 8% as Other. Twelve percent of the sample identified themselves as Hispanic. Twenty five percent of the sample was considered low SES according to the Hollingshead socioeconomic status index.

The sample consisted of the following principal diagnoses: Generalized Anxiety Disorder (GAD) Only n=33, 7%; Social Phobia (SP) Only n=55; 11%; Separation Anxiety Disorder (SAD) Only n=16, 3%; ; SAD, SP, and GAD n=175, 36%; SP and GAD n=137, 28%; SAD and GAD n=39, 8%; SAD and SP n=33, 7%;. Forty four percent of the sample met criteria for a secondary comorbid diagnosis, including another internalizing disorder (n=213; 44%), Attention Deficit-Hyperactivity Disorder (ADHD; n=58, 12%), Oppositional Defiant Disorder or Conduct Disorder (ODD or CD; 46, 9%), and Tic Disorders (n=13; 3%).

Procedure

The CAIS parent and child versions were completed as part of a larger assessment battery at CAMS baseline. The study was approved by the Institutional Review Boards at each of the 6 participating sites and both parental consent and child assent were obtained. Families participated in a structured diagnostic interview and then completed the CAIS along with other measures. Detailed descriptions of the sample and procedures can be found in Walkup et al., 2008; Compton et al., 2010; and Kendall et al., 2010.

Measures

Children's Anxiety Impact Scale (CAIS; Langley et al., 2004)—The CAIS is a 27-item parent and child self-report questionnaire assessing the impact of anxiety symptoms on the psychosocial functioning of children and adolescents. The initial pool of items was generated by the measure's developers based on a review of clinic charts, other measures of anxiety, empirical literature, and interviews with anxiety disordered children, in order to reflect their common specific impairments. The CAIS items were initially sorted into three a priori categories: impairment in academic, social, and home/family environments. Parallel parent and child report versions ask the respondent to rate how much difficulty the child has had completing each activity due to his or her anxiety symptoms during the last month. Each item is scored on a 4-point Likert scale ("0" not at all, "1" just a little, "2" pretty much, "3" very much). A total score sums the scores.

Anxiety Disorders Interview Schedule for Children, Version IV (ADIS-IV)—The ADIS-IV (Silverman & Albano, 1996) is a semi-structured interview that assesses the major DSM-IV anxiety, mood, and externalizing disorders experienced by school-aged children and adolescents. In addition to generating DSM-IV diagnoses, interviewers assign a clinical severity rating (CSR), based on an 8-point scale (0 = not at all, 4 = some, 8 = very, very much), for each assigned diagnosis (Silverman & Albano, 1996). Each CSR of 4 or above indicates a diagnosis (disorder). Inter-rater reliability for the ADIS is excellent (r= .98 for the parent interview and r= .93 for the child; Silverman & Nelles, 1988). In addition, its reliability (Lyneham, Abbott, & Rapee, 2007) validity (Wood et al., 2002) and sensitivity to treatment-related changes (Hudson et al., 2009; Kendall et al., 1997) are well-documented.

The Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & et al., 1997) is a 39-item self-report measure of anxiety symptoms yielding 4 scale scores and a total score. Each item is rated on a four-point Likert-type response scale ranging from "Never true about me" (0) to "Often true about me" (3). The four scales were empirically derived through principal components analysis and include: Social Anxiety (9 items), Separation Anxiety/Panic (9 items), Harm Avoidance (9 items), and Physical Symptoms (12 items). The predictive and discriminative validity of the MASC are well established (Baldwin & Dadds, 2007; Rynn et al., 2006) and it demonstrates excellent three-week retest reliability (r= .79; March et al., 1997). A parent version of the MASC was created by rewording items to reflect the perception of the parent about his or her child. Higher scores on both forms indicate higher levels of impairment. Child *t*-scores and parent total scores (raw) were used in analyses (MASC does not yet have normative data for the

parent version). Cronbach's alpha for the total MASC-Child and MASC-Parent in the current sample were .91 and .88, respectively.

The Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1997) is a psychometrically sound child- and parent-report questionnaire that assesses the presence of DSM-IV anxiety symptoms (Birmaher et al., 1999; Birmaher et al., 1997; Monga et al., 2000). SCARED total scores were used in these analyses, with higher scores indicating more impairment. The psychometric properties of the SCARED have been established in both community (Hale, Raaijmakers, Muris, & Meeus, 2005) and primary care samples (Wren, Bridge, & Birmaher, 2004). Cronbach's alpha for the total SCARED-Child and SCARED-Parent in the current sample were .93 and .90, respectively.

Child Behavior Checklist (CBCL; Achenbach, 1991) is a widely used 118-item parent-report scale that includes broadband subscales of internalizing and externalizing symptomatology, as well as specific scales developed to provide information on a broad range of competencies and behavior problems in preschoolers, school-age children, and adolescents. The items are empirically derived by their ability to discriminate between referred and typically developing samples. The CBCL demonstrates solid psychometric properties (Achenbach, 1991), with excellent internal consistency (total scale (α =.97), retest reliability (r= .81 over one year), and good concurrent validity (Achenbach & Rescorla, 2001).

Pediatric Anxiety Rating Scale (PARS; (PARS; Research Units on Pediatric Psychopharmacology (RUPP) Anxiety Study Group, 2002). The PARS is a 50-item clinician-rated anxiety symptom checklist designed to rate the combined severity of symptoms of SAD, GAD, and SP. The PARS has excellent inter-rater reliability (> .97) and was the dimensional outcome measure in CAMS. It provides an index of general severity of anxiety in youth.

The Children's Global Assessment Scale (CGAS; Shaffer et al., 1983) provided an estimate of baseline functional impairment. The CGAS is a commonly used measure assessing global severity of disturbance in young people ages 4–16. The CGAS scores identify both symptom severity and interference and range from 1 to 100, with lower scores indicating greater functional impairment. The CGAS has demonstrated adequate psychometric properties (Bird, Canino, Rubiostipec, & Ribera, 1987; Schorre & Vandvik, 2004; Steinhausen & Metzke, 2001).

Results

Confirmatory Factor Analysis and Internal Consistency

The original CAIS-Parent and Child versions included three *a priori* subscales (i.e., school, social, home/family), and confirmatory factor analysis was performed. To evaluate the factor structure of the CAIS, all parent and child items were subject to a multitrait multimethod confirmatory factor analysis using structural equation modeling (SEM) with MPlus Version 7. All items were loaded on their respective subscales (school, social, or home/family; the trait factors) as well as onto a child or a parent factor (the method factors). The model was identified by constraining the covariance between trait and method factors to

zero. Covariances between traits were freely estimated. This approach decomposes each item's variance into three parts: shared on the subscale of interest, shared because of method (parent or child), and uniqueness. Because the items had a small number of discrete, ordered, values, they were analyzed using an ordered probit model and weighted least squares. Missing data (< 4% for all items) was modeled using all available information (Asparouhov & Muthén, 2010), which yields consistent estimates when the data are missing completely at random or missing at random. The individual item estimates are included in Table 1a–1c. Following the suggestion of Hu and Bentler (1999) model fit was evaluated with an incremental and absolute fit index, Root Mean Square Error of Approximation (RMSEA), and the Comparative Fit Index (CFI), respectively, in addition to the chi-square test of model fit.. The CFI compares the proposed factor structure to model that does not fit, and a value of >.90 indicates a good fit. Finally, the RMSEA indicates whether the currently specified model reflects a well-fitted model, and a value of <.05 indicates a good fit. Fit indices suggest our specified factor structure was a reasonable fit, $\chi^2_{(df=1320)} = 3055.14$, $p < .0001$, CFI = .88, RMSEA = .05.

To examine whether the model was invariant across age and sex, we compared a multiple group model where the factor loadings and thresholds were freely estimated across ages and a model where they were constrained to be equal. For the freely estimated model, chi-square = 3935.625, df = 2,640, CFI = .895, RMSEA = .045, and for the constrained model, chi-square = 4204.983, df = 2,851, CFI = .891, RMSEA = .044. The change in CFI was .004, suggesting that the constrained model was an equally good fit as the freely estimated, supporting that the bifactor structure is invariant across age groups. The same procedure was followed for gender. For the free model, chi-square = 4221.516, df = 2,640, CFI = .877, RMSEA = .05, and for the constrained model, chi-square = 4284.023, df = 2,851, CFI = 889, RMSEA = .045. Here the change in CFI was −0.012, actually higher in the constrained model than in the freely estimated model, again suggesting that the bifactor structure we found previously was invariant across gender.

Tables 2 and 3 present interfactor correlations for the CAIS-Parent Report (CAIS-P) and CAIS Child Report (CAIS-C). Subsequent reliability and validity analyses were conducted on the 27-item, 3 factor scale. Internal consistency was very good for the CAIS-P factors: Social (α=.85), School (α=.85), Home (α=.70), and Total (α=.88). Internal consistency was similarly good for the CAIS-C: Social (α=.83), School (α=.82), Home (α=.72), and Total (α=.90).

Item frequencies

The CAIS-P items most frequently reported as causing significant interference (rated as 2= "pretty much" or 3= "very much") were: Concentrating on His or her Work (46%), Sleeping at night (43%), Making new friends (43%), Being with a group of strangers (43%), and Taking Tests or Exams (39%). The CAIS-C items most frequently endorsed were: Being with a Group of Strangers (41%), Giving oral reports (32%), Concentrating on School Work (29%), Getting Good Grades (27%), and Making New Friends (25%). Means, standard deviations, and endorsement rates for each item appear in Tables 4a–c for the CAIS-P and Tables 5a–c for the CAIS-C.

Construct validity

For the following correlational analyses, the critical alpha was adjusted for the number of tests run using the Bonferroni correction. Thus, the critical value is .004 based on 13 correlational tests per scale instead of .05. All analyses were run using Statistical Package for Social Sciences (SPSS version 20.0). Please see Table 6 for means and standard deviations of measures.

Parent Report—The correlations between CAIS-P Total scores and factor scores and other measures of anxiety and global impairment are presented in Tables 7–9. As predicted, the CAIS-P Total Score was positively correlated with the Internalizing Scale of the CBCL (r=.40, p<.0001), the MASC-Total score (r=.24, p<.0001), the SCARED Total Score (r=.63, p<.0001), the PARS (r=.47, p<.0001), and was negatively correlated with the CGAS (r=−.33, p<.0001) ratings. Counter to expectations, the CAIS-P was also positively correlated with the CBCL Externalizing scale.

Also as predicted, the CAIS-P School Subscale was positively related to the SCARED School Phobia Subscale (r=.39, p<.0001), and negatively related to the CBCL School Competence Subscale (r=−.25, p<.0001). In addition, the CAIS-P Social Subscale was significantly related to the MASC-P Social Anxiety Factor (r=.27, p<.0001) and the SCARED Social Phobia Subscale (r=.50, p<.0001) and negatively related to the CBCL School Competence Subscale (r=−.40, p<.001). See Table 9.

Beyond measures of symptoms, the CAIS-P was significantly associated with key outcomes. After controlling for both the SCARED total and MASC total, the CAIS-P total score remained significantly associated with the CBCL internalizing score (B = 0.36, sd = 0.03, $p < 0.01$). Similarly, after controlling for the SCARED social subscale and the MASC social subscale, the CAIS-P social factor remained significantly associated with the CBCL Social Competence Scale (B = −0.51, sd = 0.07, $p < 0.001$). Finally, when controlling for the SCARED social phobia subscale, the CAIS-P School factor remained significantly associated with the CBCL Competence School Scale (B = −0.36, sd = 0.07, $p < 0.001$).

Correlations between all CAIS-P subscales and total score and socioeconomic status (SES) were not significant; however, age was positively correlated with the CAIS total score and the Social Activities subscale (r=.25, p<.0001). One way analysis of variance revealed no significant subscale or total score differences based on race and independent sample T tests showed no significant differences based on Gender or Hispanic ethnicity.

Child Report—The correlations between CAIS-C Total scores and subscale scores and other measures of anxiety and global impairment are presented in Tables 7–9. Similar to the CAIS-Parent Report, the CAIS-C Total Score was positively correlated with the Internalizing Scale of the CBCL (r=.21, p<.0001), the MASC-Total score (r=.61, p<.0001), the SCARED Total Score (r=.68, p<.0001), the PARS (r=.26, p<.0001), and was negatively correlated with the CGAS (r=−.14, p=.002) ratings. As predicted at the outset of the study, the CAIS-C, unlike the parent report, was not significantly correlated with the CBCL Externalizing scale.

The CAIS-C School, Social, and Home Subscales were positively related to the MASC Social Anxiety Factor (r=.57, p<.0001; r=.54, p<.0001; r=.29, p<.0001, respectively) and the SCARED Social Phobia Subscale (r=.49, p<.0001; r=.57, p<.0001; r=.30, p<.0001 respectively), and negatively related to the CBCL Social Competence Subscale (r=−.21, p<.0001; r=−.23, p<.0001; r=−.18, p<.0001 respectively). In addition, the CAIS-C School, Social, and Home Subscales were significantly related to the SCARED School Phobia Subscale (r=.45, p<.0001; r=.41, p<.0001; r=.32, p<.0001 respectively), and the School and Social Subscales were negatively related to the CBCL School Competence Subscale (r=−.14, p<.004 and r=−.03, p<.004).

Beyond measures of symptom severity, the CAIS-C was significantly associated with related outcomes. After controlling for both the SCARED total and MASC total, the CAIS-C total score was still significantly associated with the CBCL internalizing score (B = 0.07, sd = 0.04, p = 0.04). Similarly, when controlling for the SCARED social subscale and the MASC social subscale, the CAIS-C social factor remained significantly associated with the CBCL Competence Social Scale (B = −0.32, sd = 0.10, p = 0.001). Finally, even after controlling for the SCARED social phobia subscale, the CAIS-P School factor was significantly associated with the CBCL Competence School Scale (B = −0.26, sd = 0.08, p = 0.001).

Correlations between all CAIS-C subscales and total score and socioeconomic status (SES) were not significant, while age was positively correlated with the School (r=.21 p<.0001), and Social (r=.18, p<.0001) subscales and CAIS-C Total score (r=.17, p<.0001). One way ANOVA revealed no significant subscale or total score differences based on race and independent sample T tests showed no significant differences based on Gender. However, independent sample T tests revealed significant differences based on self-identifying as Hispanic or non-Hispanic for the Social subscale [t=−2.91 (df=476), p=.004 and Total Score [t=−2.89 (df=485), p=.004].

The parent- and child-reports on the total CAIS were significantly correlated (r = .34, p < .001), and similarly, the parent- and child-reports were significantly correlated for the School, Social, and Home/Family subscales (r = .33, p < .001; r = .36, p < .001; and r = .32, p < .001, respectively). Additionally, while the parent and child reports are correlated, there is utility for using both the parent and child report, given that each was uniquely associated with related outcomes: when entered into a regression model simultaneously, both parent and child reported total CAIS scores were significantly associated with CBCL internalizing (B = .21, sd = .03, p < .001 and B = .05, sd = .03, p < .05, respectively).

Discussion

The present findings document confirmation of the 3-factor solution for both the parent and child CAIS and provide initial support for their construct validity. Confirmatory factor analysis supported a 3-factor solution for items from both the parent and child reports, with factors representing School, Social, and Home/Family. The CFA revealed that the specified factor structure provided an adequate fit. Subscales on both measures demonstrated strong

internal consistency and the expected correspondence with existing measures of anxiety symptom severity.

Anxiety disorders manifest in numerous forms, and the ways in which they create disruption are correspondingly diverse. Given this complexity, a challenge for clinicians and researchers rests with finding systematic, comprehensive, and efficient ways to evaluate functional impairment, a task that has, until recently, been impeded by the absence of adequate measurement tools. The CAIS is, to our knowledge, the first multidimensional self-report measure of specific anxiety-related functional impairment and one of a few instruments to include parallel parent and child versions. The present findings add to the existing literature on the CAIS (Langley et al., 2004) providing further support for its psychometric integrity. Moreover, they mark an important step forward in developing measures that paint a full picture of the burden of disease associated with child and adolescent anxiety.

As expected, total scores on both the parent and child versions of the CAIS were positively associated with measures of anxiety symptom severity, including total scores from a number of widely used measures of global anxiety such as the SCARED, the MASC, and the PARS. Moreover, CAIS total scores demonstrated the expected inverse relationship with measures of global functioning as indicated by the CGAS. Although the child self-report form demonstrated the anticipated divergence from the externalizing scale of the CBCL, it was somewhat surprising that the parent version did not. It may be the case that the irritability often associated with anxiety is interpreted by parents as a symptom of oppositional behavior. Alternatively, this linkage may reflect the power struggles that emerge as parents try to negotiate increasingly challenging situations with highly anxious and impaired youth.

Further support for the construct validity of the CAIS was provided by analysis of its subscales. On both the parent- and child-report forms, the School factor was positively associated with the School Phobia scale of the SCARED and negatively with the School Competence Subscale of the CBCL. In addition, on both versions of the CAIS, the Social factor was positively associated with the Social Anxiety scale of the MASC and the Social Phobia scale of the SCARED. Moreover, both parent and child report CAIS Social Factor scores were found to be significantly related to CBCL Social Competence even after controlling for the SCARED Social subscale and the MASC Social subscale. Likewise, both parent and child report CAIS School Factor scores were found to be significantly related to CBCL School Competence even after controlling for SCARED social phobia subscale. Taken together, these findings provide support for the utility of the CAIS in capturing different domains of anxiety-related functional impairment as well as above and beyond symptom severity..

Age effects did emerge across both parent and child report forms of the CAIS. On the parent-report form, older youth appeared more likely to experience impairment with social opportunities and less likely to have impairments in functioning at home compared to younger youth. On the child-report form, age was positively associated with school interference and impairment related to social evaluation. It may be the case that as youngsters progress towards adolescence and peer and romantic relationships assume a

central role, the impact of their anxiety on social functioning becomes more pronounced. Likewise, as academic pressure and complexity increases with age and task demands become more rigorous, it may grow increasingly difficult to manage anxiety-related interference.

Although these findings suggest that the CAIS is a promising tool, several limitations must be considered. First, as the analyses herein were cross-sectional, an important issue pertains to establishing retest reliability and the predictive validity of the CAIS via longitudinal designs. Along related lines, given growing emphasis on measuring functional outcomes in clinical trials research, additional examination of the treatment sensitivity of these measures is needed. Second, while the integration of measures from multiple informants including blind IE raters is a strength of this study, it is important to note that method variance constrains interpretation of findings on which parents (or children) were the informant on both the CAIS and other measures of anxiety symptom severity. Third, the CGAS was the only measure of impairment used for validity comparisons. Finally, we found unexpected differences among Hispanic versus non-Hispanic young people, with higher scores for children who self-identify as Hispanic on the Social Subscale and the CAIS-C Total. These findings remain puzzling—although they may reflect different cultural interpretations of anxiety disorders and their related impact--and suggest the need for future research using the CAIS with larger samples of Hispanic youth. Perhaps more importantly, they underscore the need for the development of culturally sensitive measures of anxiety-related functional impairment.

Despite these limitations, the CAIS has much to offer. Its self-report format, parallel parent- and child-forms, and coverage of a range of specific impairment examples across multiple domains make it an efficient and thorough measure of anxiety disorder impact. Such a measure serves a vital role in the study of heterogeneous conditions such as anxiety disorders, where adverse impact often shows up in subtle and overlooked forms. It is hoped that the CAIS will fill a gap in the existing base of assessment tools, and facilitate systematic, multidimensional assessment of anxiety interference in the service of both accurate diagnosis and effective treatment planning.

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Table 1a

Individual Item Estimates of CAIS Parent and Child Report CAIS-School Subscale

	Parent Estimate (SE)	Child Estimate (SE)
Getting to School on Time	0.46*** (0.04)	0.29*** (0.05)
Giving Oral Reports/Reading Out Loud	0.42*** (0.05)	0.25*** (0.05)
Writing in Class	0.70*** (0.03)	0.30*** (0.06)
Taking Tests or Exams	0.80*** (0.02)	0.37*** (0.05)
Completing Assignment in Class	0.87*** (0.02)	0.47*** (0.05)
Doing Homework	0.82*** (0.02)	0.48*** (0.05)
Getting Good Grades	0.81*** (0.02)	0.38*** (0.05)
Doing Fun Things	0.13* (0.05)	0.21*** (0.06)
Concentrating on his/her Work	0.85*** (0.02)	0.44*** (0.05)
Eating Lunch with Other Kids	0.29*** (0.07)	0.13* (0.06)

Note.

* p<.05,

** p<.01

*** p<.001

Table 1b

Individual Item Estimates of CAIS Parent and Child Report CAIS-Social Subscale

	Parent Estimate (SE)	Child Estimate (SE)
Making New Friends	0.59*** (0.05)	0.51*** (0.04)
Leaving the House	0.28*** (0.06)	0.26*** (0.07)
Talking on the Phone	0.44*** (0.06)	0.42*** (0.05)
Being with a Group of Strangers	0.47*** (0.05)	0.34*** (0.06)
Going to a Friend's House During Day	0.29*** (0.07)	0.38*** (0.06)
Spending the Night at a Friend's House	0.19** (0.07)	0.20** (0.06)
Going to a Sports Event or Ball Game	0.37*** (0.07)	0.44*** (0.06)
Going Shopping or Trying on Clothes	0.32*** (0.07)	0.40*** (0.06)
Going on a Date	0.73*** (0.06)	0.75*** (0.04)
Having a Boyfriend/Girlfriend	0.78*** (0.05)	0.72*** (0.04)
Eating in Public	0.32*** (0.07)	0.30*** (0.06)

Note.

* p<.05,

** p<.01

*** p<.001

Table 1c

Individual Item Estimates of CAIS Parent and Child Report CAIS-Home Subscale

	Parent Estimate (SE)	Child Estimate (SE)
Getting Ready for Bed at Night	0.73*** (0.03)	0.33*** (0.05)
Sleeping at Night	0.72*** (0.03)	0.35*** (0.05)
Getting Along with Siblings	0.63*** (0.04)	0.45*** (0.05)
Getting Along with Parents	0.70*** (0.04)	0.44*** (0.05)
Visiting Relatives	0.25 (0.07)	0.03*** (0.07)
Having Relatives Visit	0.22 (0.06)	0.10*** (0.07)

Note.

* p<.05,

** p<.01

*** p<.001

Table 2

InterScale Correlations for the CAIS-Parent Report

Scale	School	Social	Home
School	1		
Social	.44***	1	
Home	.40***	.34***	1

Table 3

InterScale Correlations for the CAIS-Child Report

Scale	School	Social	Home
School	1		
Social	.62***	1	
Home	.60***	.49***	1

Note.

*** p<.0001

Table 4a

CAIS-P Item Means (sd), Prevalences, Item-Total Correlations, and Alphas if Deleted

Item	Mean	SD	% Endorsing Impairment	Item-Total r	alpha if item deleted
SCHOOL					
Getting to School on Time	1.00	1.07	30%	.45	.84
Giving Oral Reports/Reading Out Loud	1.24	1.15	39%	.43	.84
Writing in Class	1.73	.94	22%	.60	.83
Taking Tests or Exams	1.21	1.11	39%	.69	.82
Completing Assignment in Class	1.23	1.11	39%	.73	.82
Doing Homework	1.20	1.11	38%	.68	.82
Getting Good Grades	1.09	1.06	34%	.68	.82
Doing Fun Things	1.03	.96	31%	.18	.86
Concentrating on his/her Work	1.42	1.01	46%	.70	.82
Eating with Other Kids	.54	.87	15%	.33	.85

Note: Percentage of item endorsement is presented for items rated as ≥2 (which specifies “pretty much” or “very much” interference). The item-total correlations were corrected to eliminate the target item from the total score for each scale.

Table 4b

CAIS-P Item Means (sd), Prevalences, Item-Total Correlations, and Alphas if Deleted

Item	Mean	SD	% Endorsing Impairment	Item-Total r	alpha if item deleted
SOCIAL					
Making New Friends	1.30	1.15	43%	.46	.84
Leaving the House	.75	.88	20%	.32	.84
Talking on the Phone	.81	1.00	22%	.30	.84
Being with a Group of Strangers	1.34	1.09	43%	.44	.83
Going to a Friend's House During Day	.70	.99	21%	.51	.83
Spending the Night at a Friend's House	1.10	1.25	35%	.34	.85
Going to a Sports Event or Ball Game	.42	.78	11%	.44	.83
Going Shopping or Trying on Clothes	.51	.87	15%	.32	.84
Going on a Date	.28	.80	9%	.53	.84
Having a Boyfriend/Girlfriend	.37	.86	12%	.53	.84
Eating in Public	.55	.90	16%	.54	.84

Note: Percentage of item endorsement is presented for items rated as ≥2 (which specifies "pretty much" or "very much" interference). The item-total correlations were corrected to eliminate the target item from the total score for each scale.

Table 4c

CAIS-P Item Means (sd), Prevalences, Item-Total Correlations, and Alphas if Deleted

Item	Mean	SD	% Endorsing Impairment	Item-Total r	alpha if item deleted
HOME					
Getting Ready for Bed at Night	1.22	1.09	39%	.55	.64
Sleeping at Night	1.33	1.11	43%	.45	.65
Getting Along with Siblings	.88	.97	26%	.39	.65
Getting Along with his/her Parents	1.05	.98	31%	.54	.63
Visiting Relatives	.46	.78	11%	.40	.69
Having Relatives Visit	.36	.70	8%	.42	.69

Note: Percentage of item endorsement is presented for items rated as ≥2 (which specifies “pretty much” or “very much” interference). The item-total correlations were corrected to eliminate the target item from the total score for each scale.

Table 5a

CAIS-C Item Means (sd), Prevalences, Item-Total Correlations, and Alphas if Deleted

Item	Mean	SD	% Endorsing Impairment	Item-Total r	alpha if item deleted
SCHOOL					
Getting to School on Time	.64	.94	19%	.52	.82
Giving Oral Reports/Reading Out Loud	.95	1.11	32%	.40	.83
Writing in Class	.38	.77	10%	.50	.82
Taking Tests or Exams	.82	1.00	24%	.46	.82
Completing Assignment in Class	.73	.93	19%	.67	.80
Doing Homework	.81	1.02	25%	.58	.81
Getting Good Grades	.85	1.05	27%	.57	.81
Doing Fun Things	.74	1.05	23%	.46	.82
Concentrating on his/her Work	.98	1.03	29%	.66	.80
Eating with Other Kids	.42	.81	11%	.42	.83

Note: Percentage of item endorsement is presented for items rated as ≥2 (which specifies “pretty much” or “very much” interference). The item-total correlations were corrected to eliminate the target item from the total score for each scale.

Table 5b

CAIS-C Item Means (sd), Prevalences, Item-Total Correlations, and Alphas if Deleted

Item	Mean	SD	% Endorsing Impairment	Item-Total r	alpha if item deleted
SOCIAL					
Making New Friends	.80	1.01	25%	.58	.79
Leaving the House	.45	.79	12%	.48	.80
Talking on the Phone	.45	.81	12%	.50	.80
Being with a Group of Strangers	1.25	1.12	41%	.39	.82
Going to a Friend's House During Day	.33	.73	9%	.57	.80
Spending the Night at a Friend's House	.77	1.03	25%	.34	.82
Going to a Sports Event or Ball Game	.27	.66	8%	.54	.80
Going Shopping or Trying on Clothes	.39	.80	12%	.60	.79
Going on a Date	.36	.85	12%	.46	.80
Having a Boyfriend/Girlfriend	.36	.82	10%	.47	.80
Eating in Public	.41	.77	11%	.52	.80

Note: Percentage of item endorsement is presented for items rated as ≥2 (which specifies "pretty much" or "very much" interference). The item-total correlations were corrected to eliminate the target item from the total score for each scale.

Table 5c

CAIS-C Item Means (sd), Prevalences, Item-Total Correlations, and Alphas if Deleted

Item	Mean	SD	% Endorsing Impairment	Item-Total r	alpha if item deleted
HOME					
Getting Ready for Bed at Night	.60	.92	17%	.55	.65
Sleeping at Night	.80	1.01	25%	.45	.68
Getting Along with Siblings	.68	.97	19%	.39	.70
Getting Along with his/her Parents	.64	.91	17%	.54	.65
Visiting Relatives	.29	.65	7%	.40	.70
Having Relatives Visit	.26	.62	7%	.42	.69

Note: Percentage of item endorsement is presented for items rated as ≥2 (which specifies “pretty much” or “very much” interference). The item-total correlations were corrected to eliminate the target item from the total score for each scale.

Table 6

Means and standard deviations of measures used in validity analyses.

Scale	Mean	Standard Deviation
MASC Total T score	51.41	12.52
MASC Social Anxiety T score	52.65	13.38
CBCL Internalizing T score	67.75	7.56
CBCL Externalizing T-score	52.76	10.42
CBCL Competence: School	44.49	8.89
CBCL Competence: Social	43.17	9,70
SCARED Total	23.40	15.10
SCARED Social	6.37	4.24
SCARED School	2.25	2.21
SCARED-Parent Total	32.10	12.85
SCARED-Parent Social	8.73	4.10
SCARED-Parent School	3.21	2.50
PARS Total	19.16	4.20
CGAS	50.71	7.11

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Table 7

Correlations between CAIS scales and Demographic and Clinical Variables

Scale	Age	SES	CBCL Internalizing	CBCL Externalizing	MASC Total	SCARED Total
Parent						
CAIS-Total	.14*	−.05	.40**	.24**	.24**	.63**
School	.10	−.01	.35**	.19**	.21**	.51**
Social	.25**	−.09	.26**	.08	.18**	.48**
Home	−11	−.02	.36**	.44**	.17**	.47**
Child						
CAIS-Total	.17**	−.08	.21**	.09	.61**	.68**
School	.21**	−.05	.21**	.08	.57**	.61**
Social	.18**	−.09	.15**	.00	.53**	.59**
Home	−.08	−.05	.16**	.20**	.43**	.49**

Note.

* p<.004 noted as statistically significant after Bonferroni correction for 13 correlational tests.

** p<.0001

Table 8

Correlations between CAIS Social and Clinician severity scores

Scale	PARS	CGAS
Parent		
CAIS-Total	.47**	−.33**
School	.35**	−.23**
Social	.40**	−31**
Home	.34**	−.22**
Child		
CAIS-Total	.26**	−.14*
School	.24**	−.15*
Social	.20**	−.09
Home	.18**	−.06

Note.

* p<.004 noted as statistically significant after Bonferroni correction for 13 correlational tests.

** p<.0001

Table 9

Correlations between CAIS Social and School subscales and Related MASC, SCARED, and CBCL Subscales

Scale	MASC Social Anxiety	SCARED Social Phobia	CBCL Social Competence	SCARED School Phobia	CBCL School Competence
Parent					
CAIS-Total	.26**	.43**	−.37**	.39**	−.17**
School	.21**	.28**	−.24**	.39**	−.25**
Social	.27**	.50**	−.40*	.23**	−.02
Home	.08	.14*	−.23**	.25**	−.08
Child					
CAIS-Total	.59**	.56**	−.25**	.48**	−.10
School	.57**	.49**	−.21**	.45**	−.14*
Social	.54**	.57**	−.23**	.41**	−.03*
Home	.29**	.30**	−.18**	.32**	−.05

Note.

* p<.004 noted as statistically significant after Bonferroni correction for 13 correlational tests.

** p<.0001