



Published in final edited form as:

*Psychol Assess.* 2009 September ; 21(3): 402–411. doi:10.1037/a0016719.

## The Intolerance of Uncertainty Scale for Children: A Psychometric Evaluation

Jonathan S. Comer, PhD<sup>1</sup>, Amy K. Roy, Ph.D.<sup>2</sup>, Jami M. Furr, M.A.<sup>3</sup>, Kristin Gotimer, B.A.<sup>2</sup>, Rinad S. Beidas, M.A.<sup>3</sup>, Michel J. Dugas, Ph.D.<sup>4</sup>, and Philip C. Kendall, Ph.D., ABPP<sup>3</sup>

<sup>1</sup> Department of Psychiatry, Columbia University, New York, NY, USA

<sup>2</sup> Department of Child Psychiatry, New York University School of Medicine, New York, NY, USA

<sup>3</sup> Department of Psychology, Temple University, Philadelphia, PA, USA

<sup>4</sup> Department of Psychology, Concordia University, Montreal, Quebec, Canada

### Abstract

Intolerance of Uncertainty (IU) has contributed to our understanding of excessive worry and adult anxiety disorders, but there is a paucity of research on IU in child samples. This gap is due to the absence of a psychometrically sound measure of IU in youth. The present study adapted parallel child- and parent-report forms of the Intolerance of Uncertainty Scale (IUS) and examined the internal consistency, convergent validity, and classification properties of these forms in youth aged 7–17 ( $M = 11.6$  years,  $SD = 2.6$ ). Participating youth ( $N = 197$ ; 100 females) either met diagnostic criteria for an anxiety disorder ( $N = 73$ ) or were non-referred community participants ( $N = 124$ ). The child-report form (i.e., IUS for Children, or IUSC), and to a lesser extent the parent-report form, demonstrated strong internal consistency and convergent validity, evidenced by significant associations with anxiety and worry (and reassurance-seeking in the case of the child-report form). Children diagnosed with anxiety disorders scored higher than non-referred community youth on both forms. ROC analysis demonstrated acceptable overall utility in distinguishing the two groups of youth. Findings provide preliminary support for use of the IUSC for continuous measurement of children's ability to tolerate uncertainty.

### Keywords

Intolerance of Uncertainty; Child; Anxiety; Worry; Anxiety Disorders

---

Intolerance of uncertainty (IU) can be viewed as a dispositional characteristic that results from a set of negative beliefs about uncertainty and its implications (Dugas & Robichaud, 2007). IU is associated with a tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events (Dugas, Buhr, & Ladouceur, 2004) and characterizes individuals who find ambiguity distressing and have difficulty functioning in uncertain situations. Empirical work with adults finds specific relationships between IU and worry in both nonclinical and clinical samples (e.g., Buhr & Dugas, 2002; Dugas, Marchand, & Ladouceur, 2005), and such work has contributed greatly to our understanding of excessive worry, obsessionality, and generalized anxiety disorder (GAD) in adults (e.g., Dugas, Gagnon, Ladouceur, & Freeston, 1998; Holaway, Heimberg, & Coles, 2006).

Intolerance of uncertainty has been proposed as a cognitive vulnerability factor for excessive worry and GAD (Koerner & Dugas, 2008), given preliminary evidence of manipulability (Dugas & Ladouceur, 2000; Ladouceur, Gosselin & Dugas, 2000), stability (Buhr & Dugas, 2002; Freeston, Rheaume, Letarte, Dugas, & Ladouceur, 1994), and temporal antecedence of IU with respect to worry within adult samples (Dugas & Ladouceur, 2000; see Kraemer, Kazdin, & Offord, 1997 and Riskind & Alloy, 2006 for criteria for establishing vulnerability). Whereas worry, the cardinal feature of GAD, refers to a relatively uncontrollable and negatively affect-laden chain of thoughts and images (Borkovec, Robinson, Pruzinsky, & DePree, 1983), intolerance of uncertainty refers to a cognitive set of beliefs and attitudes about uncertainty and its implications that may heighten the risk for excessive worry.

There is a paucity of research on IU in children and little is known about its relationships with childhood anxiety disorders and anxiety-related processes in youth. Although theoretical accounts note that an inability to tolerate uncertainty may play a key role in the etiology of GAD and maladaptive worry in adults (e.g., Dugas et al., 2004), research has yet to examine the temporal relationships between IU, chronic worry, and anxiety disorders. Given that anxiety disorders typically onset between childhood and mid-adolescence—a developmental period marked by brain maturation in key regions associated with behavior in the context of uncertainty (Krain et al., 2006; Krain et al., 2008)—examination of IU in youth is critical to inform developmental models of anxiety disorders and to inform prevention efforts.

The paucity of data on IU in youth samples is likely due in part to the absence of a psychometrically sound measure for use with children and adolescents. The Intolerance of Uncertainty Scale (IUS; Freeston et al., 1994) has adult respondents report on their emotional, cognitive, and behavioral reactions to ambiguous situations and the uncontrollability of life events. The IUS was developed for use with adults and its items contain complex and abstract wordings that would be particularly difficult for children to understand and do not relate to children's contexts (e.g., IUS items include “the ambiguities of life stress me,” “uncertainty makes life intolerable,” “a small unforeseen event can spoil everything, even with the best of planning”).

To inform treatment efforts and developmental models of IU and anxiety disorders across the lifespan, there is a need for a developmentally sensitive measure of children's ability to tolerate uncertainty. The present study evaluates the psychometric properties of a child IUS in a sample of youth aged 7–17. Revising psychological tests for use with new populations has the potential to inform key issues related to construct representativeness and validity (Silverstein & Nelson, 2000). Content validity refers to the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose (Haynes, Richard, & Kubany, 1995). Accordingly, we adapted the IUS to enhance child compatibility while maintaining focus on the key facets of IU (i.e., beliefs that uncertainty is stressful and leads to an inability to act, that unexpected events are negative and should be avoided, and that being uncertain about the future is unfair; see Buhr & Dugas, 2002), and we examined internal consistency, convergent validity, and classification properties. It was hypothesized that the child-report form would evidence high internal consistency and would show significant associations with measures of childhood anxiety, worry, and reassurance-seeking. We also hypothesized that children with diagnosed anxiety disorders would score significantly higher than non-referred community youth on the child-report form of the IUSC, and that the measure would be able to correctly distinguish community youth from treatment-seeking anxiety-disordered youth. To examine the content specificity and relevance of the scale for the youngest children in our sample, and to examine the stability of performance across age cohorts, further analyses examined convergent validity and classification properties separately for children aged 7–8 and for children aged 16–17.

As cognitive limitations, symptom-related distortions, and self-presentation concerns may each compromise the accuracy of children's self-reports, the strategy of gathering data from multiple informants has become standard practice in the assessment of youth (Comer & Kendall, 2004; De Los Reyes & Kazdin, 2005). Youth rarely refer themselves for treatment and may be somewhat reluctant to participate in the assessment process, further underscoring the need for valid and reliable parent-report instruments. To maximize relevance for child populations, we also adapted a parallel parent-report form of the IUS and examined the internal consistency, convergent validity, and classification properties of this form. Finally, we examined parent-child agreement in the assessment of children's ability to tolerate uncertainty. Given that low parent-child concordance is typically found in the assessment of anxiety-related child constructs (Choudhury, Pimentel, & Kendall, 2003; Comer & Kendall, 2004; DiBartolo, Albano, Barlow, & Heimberg, 1998) we predicted parent-child agreement in the assessment of children's IU would be poor.

## Method

### Participants

Participating youth ( $N = 197$ ; ages 7–17) and their mothers were either non-referred community participants ( $N = 124$ ;  $M_{\text{age}} = 11.38$ ,  $SD = 2.4$ ; 62 females) or met diagnostic criteria for a DSM-IV childhood anxiety disorder, as determined by structured diagnostic interview ( $N = 73$ ;  $M_{\text{age}} = 11.61$ ,  $SD = 3.1$ ; 38 females) (see Table 1). Participants were recruited from across two sites—the Child and Adolescent Anxiety Disorders Clinic (CAADC) at Temple University and the New York University (NYU) Child Study Center. Youth with anxiety disorders (AD youth;  $N_{\text{Temple}} = 48$ ;  $N_{\text{NYU}} = 25$ ) and their mothers were recruited from the flow of families seeking clinical services for child anxiety-related concerns at the two sites. Non-referred community youth (COM youth;  $N_{\text{Temple}} = 90$ ;  $N_{\text{NYU}} = 34$ ) and their mothers were recruited through advertisements and through local schools. Among AD youth, roughly 22% were between ages 7–8, 23% were 9–10, 19% were 11–12, 16% were 13–14, and 21% were 15–17. Among COM youth, roughly 20% were between ages 7–8, 25% were 9–10, 31% were 11–12, 14% were 13–14, and 10% were 15–17. Fifty-seven percent of the overall sample identified as Caucasian, 34.7% African-American, 4.6% Asian-American, 2% Hispanic, and 2.2% “other.” Regarding total household income, 16.5% of the sample earned less than \$29,999, 39.4% earned \$30,000–59,999, 18.9% earned \$60,000–79,999, and 25.2% earned over \$80,000. AD youth did not significantly differ from COM youth with respect to age [ $t(195) = 1.29$ ,  $p > .05$ ], sex distribution [ $\chi^2(1, N = 197) = .10$ ,  $p > .05$ ], or total household income [ $\chi^2(3, N = 197) = 4.84$ ,  $p > .05$ ]. Similarly, youth across the two recruitment centers did not differ with regard to age [ $t(195) = 1.8$ ,  $p > .05$ ], sex distribution [ $\chi^2(1, N = 197) = 2.07$ ,  $p > .05$ ], or total household income [ $\chi^2(3, N = 197) = 3.23$ ,  $p > .05$ ]. Participants had to be English-speaking.

AD youth met DSM-IV diagnostic criteria for a principal diagnosis of generalized anxiety disorder (GAD; 38.5%), social phobia (SoPh; 22.2%), separation anxiety disorder (SAD; 15.4%), obsessive-compulsive disorder (OCD; 3.5%) or panic disorder (1%), as determined by structured diagnostic interview. Comorbid conditions were included, with roughly 65% of AD youth meeting criteria for more than 1 DSM-IV anxiety disorder. The most common non-principal diagnosis was GAD (59%), followed by specific phobia (47%), SoPh (28.3) attention-deficit/hyperactivity disorder (18.4%), MDD or dysthymic disorder (10.3%), oppositional defiant disorder (9.1%), OCD (2%), and PD (2.2%).

### Measures

**Anxiety Disorders Interview Schedule for Children and Parents for DSM-IV—** (ADIS-C/P; Silverman & Albano, 1996) The ADIS-C/P is a semi-structured diagnostic interview that assesses child psychopathology in accordance with DSM-IV criteria, with a

focus on internalizing disorders. In the AD sample, the ADIS-C (child version) and the ADIS-P (parent version) collected data on child and parents' reports of the child's anxiety. The anxiety disorders section of the ADIS-C/P for DSM-IV has demonstrated strong concurrent validity (Wood, Piacentini, Bergman, McCracken, & Barrios, 2002). In age ranges comparable to the present sample, the interview has demonstrated good reliability for parent ( $\kappa$  range from .65–.88) and child diagnostic profiles ( $\kappa$  range from .63–.88; Silverman & Ollendick, 2005; Silverman, Saavedra, & Pina, 2001).

**Multidimensional Anxiety Scale for Children**—(MASC; March, Parker, Sullivan, Stallings, & Conners, 1997). The MASC is a 39-item self-report scale that yields an overall anxiety score and four subscale scores: physical symptoms, social anxiety, harm avoidance, and separation anxiety. For the present purposes, overall anxiety T-scores, which reflect standardized scores accounting for age and sex, were used, as well as the four MASC subscales. The scale has demonstrated solid psychometric properties, including high internal consistency, retest reliability, and convergent validity (Baldwin & Dadds, 2007; March & Albano, 1998; March et al., 1997; March & Sullivan, 1999; March, Sullivan, & Parker, 1999; Wood et al., 2002; in present sample:  $\alpha = .91$ , mean inter-item  $r = .21$ ).

**Penn-State Worry Questionnaire for Children**—(PSWQ-C; Chorpita, Tracey, Brown, Collica, & Barlow, 1997). The PSWQ-C is a 14-item self-report measure of children's tendency to engage in excessive, generalized, and uncontrollable worry. The measure was adapted for use with children and adolescents from the adult Penn-State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990), and has demonstrated good convergent and discriminant validity, and excellent reliability, in clinical and community samples of youth (Chorpita et al., 1997; Muris, Meesters, & Gobel, 2001; Pestle, Chorpita, & Schiffman, 2008; in present sample:  $\alpha = .90$ , mean inter-item  $r = .19$ ). Items are rated along 4-point scales (0 = *not at all true*, 1 = *sometimes true*, 2 = *often true*, and 3 = *always true*), resulting in a possible range of total scores of 0–42.

**Reassurance-Seeking Scale for Children**—(RSSC; Joiner, Metalsky, Gencoz, & Gencoz, 2001). The RSSC is a child self-report measure of child reassurance-seeking behavior. The RSSC consists of four child self-report items, each rated along a 3-point scale, with higher scores corresponding to higher levels of child reassurance seeking. The measure has exhibited moderate to high reliability (Joiner, 1999; Joiner et al., 2001; in present sample:  $\alpha = .70$ , mean inter-item  $r = .40$ ) construct validity (Abela, Skitch, Auerbach, & Adams 2005; Abela, Zuroff, Ho, Adams, & Hankin, 2006; Joiner et al., 2001), and long-term stability (Abela et al., 2006) in samples of youth. This scale was included for a subset ( $n = 90$ ) of COM youth at the Temple site.

**Intolerance of Uncertainty Scale for Children**—(IUSC). The IUSC, developed for the present study, assesses children's tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events. Parallel child- and parent-report forms were adapted from the 27-item English version of the adult IUS (Buhr & Dugas, 2002; Freeston et al., 1994) which has demonstrated excellent psychometric properties across diverse adult samples (e.g., Buhr & Dugas, 2002; Norton, 2005). For the child-report form, items were reworded to enhance child compatibility, with three specific objectives: (1) To reduce the metacognitive content across items and content requiring a sophisticated understanding of the mind (e.g., “my mind can't be relaxed when...” became “I can't relax...”); (2) To remove figurative and complex language and idioms whose meanings children may not easily deduce from the literal definitions of the words (e.g., “sleeping soundly” became “sleeping well”); and (3) To reduce the number of polysyllabic (i.e., > 3 syllables) words (e.g., “the ambiguities of life” became “things that are unclear”). Child respondents rate the extent to which they agree

with each item along a 5-point scale (1=*not at all*, 3= *somewhat*, 5= *very much*), resulting in total scores ranging from 27 to 135. For child compatibility, instructions for the adult IUS (Buhr & Dugas, 2002) were simplified for the child-report IUSC to read: “How well do these statements describe you?” In addition, a parallel parent-report measure of children’s abilities to tolerate uncertainty was created, adapting items from the child-report IUSC to ask parents to rate their child’s tendency to react negatively to uncertain situations and events. Items are similarly rated along a 5-point scale, resulting in total scores ranging from 27 to 135. Instructions for the parent-report IUSC read: “You will find below a series of statements which describe how children may react to uncertainty. Please use the scale below to describe to what extent each item is characteristic of your child.” The resulting 27 items for the parent- and child-IUSC are included in the Appendix.

## Procedure

All study procedures were conducted under the approval of and in compliance with the Temple University and NYU School of Medicine Institutional Review Boards. COM youth were recruited through advertisements and school outreach in the New York City and Philadelphia metropolitan areas. Interested English-speaking families with a child between 7 and 17 were scheduled for an in-person appointment to participate in the present study and other research studies being conducted at the two sites. At this appointment, informed consent was obtained and parents and children completed all forms separately. Child forms were completed with the assistance of a research associate. Due to site differences in the assessment batteries administered to COM children, the RSSC was only administered for the subset of 90 COM youth at the Temple University site. COM families at the Temple University and NYU sites were compensated \$50 and \$30 for participation, respectively. Financial compensation across the two sites differed as a function of differences in the number and nature of additional research studies in which participants engaged.

AD youth were recruited from the flow of families seeking clinical services for childhood anxiety at the two sites. In addition to self-report forms, AD families were administered the ADIS-C/P. Diagnosticians conducted the parent and child ADIS interviews and, in accordance with Silverman and Albano (1996), generated an integrated parent-child composite diagnosis using the “or” rule (i.e., diagnosis is present if either the parent *or* child interview generates a positive diagnosis). Diagnosticians held a masters or doctoral degree in clinical psychology and received extensive training on the ADIS-C/P, including specialized training with one of the ADIS-C/P co-authors. Evaluation of agreement among diagnosticians revealed high inter-rater reliability ( $\kappa > .80$  for all anxiety diagnoses). AD families recruited at Temple University subsequently received treatment for their child’s anxiety. AD families recruited at NYU received a diagnostic report and \$30.

## Analytic Strategy

To examine the internal consistency of the IUSC, Cronbach’s alphas ( $\alpha$ ) were computed for the parent- and child-report forms. To examine convergent validity, we computed correlations between parent- and child-report forms of the IUSC and child anxiety as measured by the MASC, worry as measured by the PSWQ-C, and reassurance-seeking behavior as measured by the RSSC. The correlation between parent- and child-report forms of the IUSC was computed to assess parent-child agreement.

To examine the classification properties of the IUSC parent- and child report-forms, we used receiver operating characteristic (ROC) analysis on an evenly distributed subset of 40 cases (20 randomly selected AD youth; 20 randomly selected COM youth). ROC analysis provides a depiction of an instrument’s accuracy by demonstrating the limits of the instrument’s ability to discriminate over the complete spectrum of cut scores (for a review of ROC analysis, see



Zweig and Campbell, 1993). At each potential cut score, we examined estimates of *sensitivity* (percentage of AD youth correctly identified by the IUSC as anxious) and corresponding *specificities* (percentage of COM youth correctly identified by the IUSC as non-anxious), as well as *positive predictive power* (PPP; i.e., the percentage of children classified by the IUSC as anxious who were actually from the AD sample) and *negative predictive power* (NPP; i.e., the percentage of children classified by the IUSC as non-anxious who were from the COM sample). Kappa coefficients ( $\kappa$ ; Cohen, 1960) and overall correct classification rates were computed for further descriptive purposes.

## RESULTS

Table 2 presents the means and standard deviations of all study measures. IUSC scores did not differ by child sex among COM youth (parent-report:  $t(122) = .59, p > .05, d = .10$ ; child-report:  $t(122) = -.51, p > .05, d = .10$ ), or among AD youth (parent-report:  $t(71) = -1.03, p > .05, d = .10$ ; child-report:  $t(71) = -1.07, p > .05, d = .13$ ). Among AD youth, IUSC scores did not vary by age (parent-report:  $r(71) = -.04, p > .05$ ; child-report  $r(71) = .06, p > .05$ ). In contrast, among COM youth, IUSC self-reports did vary by age ( $r(122) = -.30, p < .01$ ). Specifically, younger children in the community self-reported greater difficulty tolerating uncertainty than older children in the community. Parent-reports, in contrast, did not vary by age among COM youth ( $r(122) = -.10, p > .05$ ). Child-report IUSC scores and parent-report IUSC scores were not associated with income ( $F(3, 194) = 2.1, p > .05$ ;  $F(3, 194) = 0.13, p > .05$ , respectively), or race/ethnicity ( $F(2, 195) = 1.9, p > .05$ ;  $F(2, 195) = 0.90, p > .05$ , respectively). AD youth reported greater anxiety ( $t(195) = 4.61, p < .05, d = .66$ ) and worry ( $t(195) = 11.3, p < .05, d = 1.59$ ) than COM youth.

### Internal Consistency

Cronbach's alphas were calculated to examine the internal consistency of the parent- and child-report forms of the IUSC. Cronbach's alphas greater than .80 are generally considered to evidence acceptable reliability (Clark & Watson, 1995). Across the full sample, internal consistency was excellent for the IUSC parent-report form ( $\alpha = .96$ ; mean inter-item  $r = .50$ ) and child-report form ( $\alpha = .92$ , mean inter-item  $r = .41$ ). Similarly, internal consistency was excellent within COM youth (parent-report  $\alpha = .94$ , mean inter-item  $r = .46$ ; child-report  $\alpha = .91$ , mean inter-item  $r = .40$ ) and AD youth (parent-report  $\alpha = .96$ , mean inter-item  $r = .50$ ; child-report  $\alpha = .94$ , mean inter-item  $r = .43$ ).

### Convergent Validity

Table 3 presents the zero-order correlations between parent- and child-report forms of the IUSC and child anxiety as measured by the MASC, worry as measured by the PSWQ-C, and reassurance-seeking behavior as measured by the RSSC. Table 4 presents partial correlations among study variables, after controlling for child age. To reduce the probability of Type I error, a Bonferroni-adjusted 0.005  $\alpha$ -level was adopted. In accordance with Cohen's (1988) guidelines for interpreting the magnitude of correlations, the parent-report form of the IUSC evidenced moderate to large associations with children's self-reports of anxiety and worry. The child-report form of the IUSC evidenced large associations with children's self-reports of anxiety and worry, and a moderate to large association with children's self-reports of reassurance-seeking behavior. In addition, as expected, AD youth scored significantly higher than COM youth on the IUSC parent-report ( $F(1, 194) = 46.58, p < .0001, d = 1.01$ ) and child-report ( $F(1, 194) = 9.41, p < .005, d = .61$ ), providing further evidence of validity.

Child- and parent-report IUSC scores were examined with respect to individual MASC subscales. After controlling for child age, child-report IUSC scores showed the highest association with the physical symptoms scale ( $r = .71$ ), followed by the social anxiety scale

( $r = .61$ ), separation/panic scale ( $r = .56$ ), and harm avoidance scale ( $r = .34$ ) (all  $p$ 's  $< .005$ ). Parent-report IUSC scores, after controlling for child age, showed a significant association with the social anxiety scale ( $r = .27$ ,  $p < .005$ ); associations between parent-report IUSC and the other MASC subscales were non-significant.

To examine the stability of convergent validity across age cohorts, follow-up analyses examined these associations among youth aged 7–8 ( $N = 38$ ;  $M_{\text{age}} = 7.9$ ,  $SD = 0.6$ ) and among youth aged 16–17 ( $N = 25$ ;  $M_{\text{age}} = 16.6$ ,  $SD = 0.5$ ). Similar to the full sample, among 7–8 year old children the child-report form of the IUSC evidenced large associations with children's self-reports of anxiety ( $r = .67$ ,  $p < .005$ ) and worry ( $r = .60$ ,  $p < .005$ ), and a moderate to large association with children's self-reports of reassurance-seeking behavior ( $r = .46$ ,  $p < .005$ ). Among 7–8 year old children, the parent-report IUSC also evidenced a large association with children's self-report of worry ( $r = .60$ ,  $p < .005$ ), but not with children's self-reports of anxiety ( $r = .30$ ,  $p > .05$ ) and reassurance-seeking behavior ( $r = .21$ ,  $p > .05$ ). Regarding youth aged 16–17, the child-report form of the IUSC evidenced large associations with children's self-reports of anxiety ( $r = .77$ ,  $p < .005$ ) and worry ( $r = .76$ ,  $p < .005$ ), and a moderate to large association with children's self-reports of reassurance-seeking behavior ( $r = .40$ ,  $p < .005$ ). Among 16–17 year olds, the parent-report IUSC did not evidence significant associations with children's self-reports of anxiety ( $r = .18$ ,  $p > .05$ ), worry ( $r = .24$ ,  $p > .05$ ), or reassurance-seeking behavior ( $r = .21$ ,  $p > .05$ ).

### Parent-child Agreement

As seen in Tables 3 and 4, IUSC parent- and child-reports were not significantly correlated, documenting poor parent-child agreement in the reporting of children's ability to tolerate uncertainty.

### Classification Properties

Across the entire range of cut scores, the child-report of the IUSC demonstrated acceptable overall utility in distinguishing AD and COM youth ( $AUC = .750$ ,  $SD = 0.08$ ). This area under the curve significantly differs from .5, or the null value that would indicate no apparent distributional difference between the two groups on IUSC scores ( $p < .001$ ). The parent-report IUSC demonstrated somewhat lower utility in distinguishing AD and COM youth ( $AUC = .642$ ,  $SD = 0.09$ ). Across the range of cut scores, the IUSC demonstrated somewhat poorer discriminating utility among youth aged 7–8 (child-report  $AUC = .65$ ; parent-report  $AUC = .60$ ) and among youth aged 16–17 years (child-report  $AUC = .60$ ; parent-report  $AUC = .62$ ).

Analysis of the area under the ROC curve allows us to determine the overall utility of the IUSC in distinguishing AD from COM children across *all* scores, but does not provide indication of the classification utility of the IUSC at each potential cut score. Table 5 presents the sensitivity, specificity, positive predictive power, and negative predictive power for each IUSC cut score for which sensitivity and specificity are both greater than 50% (i.e., 52–60 for parent-report; 48–70 for child-report).

For the child-report form, within the range of cut scores from 48–70, as the cut score increases the percentage of children from the AD group who were correctly identified by the child IUSC (i.e., sensitivity) *decreases*, with indices ranging from .80 (when employing cut scores 48–54) to .55 (when employing cut scores 65–70). Alternatively, the percentage of COM youth correctly identified by the child IUSC (i.e. specificity) *increases* as the cut score increases, with indices ranging from .55 (when employing a cut score of 48) to .90 (when employing a cut score of 70). Given the inverse relationship between sensitivity and specificity, determining an acceptable cut score involves achieving a favorable balance between these classification utility indices. In the present sample, the most favorable balance for the child-report IUSC was

found when employing cut scores of 50–54, for which 80% of anxiety disorder cases were correctly classified, while 70% of community cases were correctly classified. Employing cut scores of 50–54 ensured that 73% of children classified by the child IUSC as anxious were actually from the AD sample 78% of children classified by the IUSC as non-anxious were from the COM sample.

For the parent-report form, the most favorable balance for the parent-report IUSC was found when employing cut scores of 52–55, for which 70% of anxiety disorder cases were correctly classified, while ensuring that 55% of community cases were correctly classified. Employing cut scores of 52–55 ensured that 61% of children classified by the parent IUSC as anxious were actually from the AD sample 65% of children classified by the IUSC as non-anxious were from the COM sample (overall correct classification rate = .63).

## Discussion

The present findings provide preliminary psychometric support for the IUSC child-report form—and to a lesser extent the parent-report form—for continuous measurement of children's ability to tolerate uncertainty. Consistent with research on the adult IUS (e.g., Buhr & Dugas, 2002; Freeston et al., 1994; Norton, 2005), the child-report form of the IUSC demonstrated strong internal consistency and convergent validity, as evidenced by significant associations with anxiety and with worry across age cohorts. Convergent validity was stronger for the child-report form, which was also significantly correlated with child reassurance-seeking. Among the MASC subscales, child-report IUSC scores showed the lowest association with the harm avoidance subscale, suggesting that IU is correlated with but distinct from an aversion to harm. Children with diagnosed anxiety disorders scored significantly higher than non-referred community youth on both the parent- and child-report forms, providing further evidence of validity. In addition, across the entire range of cut scores, the child-report form of the IUSC demonstrated acceptable overall utility in distinguishing youth with anxiety disorders from non-referred community youth. The IUSC demonstrated poorer utility discriminating AD and COM youth among older (i.e., 16–17) and younger (i.e., 7–8) subsets of youth.

Given the inverse relationship between sensitivity and specificity, determining an optimal cut score involves achieving a favorable balance between the two indices. Matthey and Petrovski (2002) suggest that sensitivity of .70 and specificity of .80 are needed for a worthwhile cut score. Such a cut score would allow for at least 70% of AD cases to be correctly classified, while ensuring that at least 80% of non-AD cases are also correctly classified. As seen in Table 5, in the present sample, no IUSC cut score, for the parent- or child-report form, achieved this criterion. Findings do not support the use of the IUSC as a categorical measure to identify anxious youth, and thus the measure should not be used as a diagnostic screener or as a sole assessment when identifying anxious youth. Such findings are consistent with previous recommendations (e.g., Comer & Kendall, 2005; Fristad, Emery, & Beck, 1997; Kendall & Flannery-Shroeder, 1995) against the use of brief self-report measures in the absence of structured diagnostic interviews.

As is commonly found in the assessment of psychological processes in youth (Achenbach, McConaughy, & Howell, 1987; Choudhury et al., 2003; De Los Reyes & Kazdin, 2005), parent-child agreement on the IUSC was poor. Previous research found that parent-child agreement is particularly weak for unobservable symptoms (Comer & Kendall, 2004), and thus disagreements on the IUSC likely reflect the unobservable nature of many aspects of children's comfort with uncertainty (i.e., key features of IU may manifest outside of parents' awareness). At the same time, children's self-reports may be limited, as anxiety itself and self-presentation concerns may compromise the accuracy of child self-reports (Dadds, Perrin, & Yule, 1998; DiBartolo et al., 1998), youth rarely refer themselves for treatment, and accordingly may be



somewhat reluctant to participate in the assessment process. In the absence of a “gold standard,” we recommend gathering data from both parents and children in the measurement of childhood IU. Future work examining the nature of parent-child IUSC disagreements is needed to better understand how best to integrate discrepant reports of childhood IU.

Poor parent-child agreement may also reflect differences in item wordings across the adapted parent- and child-report IUSC measures. When adapting IUS items, figurative and complex language and idioms from the adult IUS (whose meanings children may not easily deduce from the literal definitions of the words) were removed from the child-report IUSC, whereas such idioms were retained for the parent-report IUSC. For example, as we believed children may have difficulty deducing the meaning of the phrase “*I can’t stand...*”, the phrase was changed to “*I don’t like...*” throughout a number of items in the child-report IUSC. In contrast, the original phrase “*I can’t stand...*” was retained in the parent-report IUSC, as adults would expectedly have no difficulty with the language. It is possible that these phrases connote different intensity levels of dislike, affecting informant response thresholds across the two measures, and ultimately contributing further to poor parent-child agreement across the measures.

Convergent validity of the child-report form was stable across young and old cohorts within the sample. In contrast, although acceptable convergent validity was demonstrated with respect to the parent-report form across the full sample, among older (16–17 years) and younger children (7–8 years) the parent-report form evidenced weak convergent validity. Findings argue against the use of the parent-report IUSC for youth in these two age ranges.

IUSC child self-reports varied by age among the non-referred community, but not AD, sample, with younger community children reporting higher IUSC scores than older children. It may be that normative development is marked by increased ability to tolerate uncertainty, whereas the ability to tolerate uncertainty fails to sufficiently emerge in children with anxiety disorders. Alternatively, age-related findings may reflect differences in how children interpret IUSC items across different levels of cognitive development and abilities for self-reflection.

Several limitations warrant comment. Associations between child IUSC scores and reports of child anxiety, worry, and reassurance-seeking could have been inflated due to shared method variance (i.e., self-report data). Stronger convergent validity for the child-report IUSC over the parent-report IUSC may be a consequence of this shared method variance. Future work is needed to examine IUSC reports in the context of performance-based tasks assessing children’s behavior under conditions of uncertainty (e.g., the HiLo game; Krain et al., 2006; Krain et al., 2008). Given the number of IUSC items, the size of the present sample did not permit a factor analysis. Although internal consistency was excellent (parent-report form  $\alpha = .96$ ; child-report form  $\alpha = .92$ ), high Cronbach’s alphas cannot be interpreted as compelling evidence of unidimensionality. Future work with multiple data collection points would inform us about retest reliability and the stability of childhood IU reports. Diagnostic interviews were not conducted with the COM sample. Although COM youth scored substantially lower on measures of anxiety and worry, it is nonetheless possible that some of the non-referred community youth suffer from an anxiety disorder. In addition, IU has a particularly strong association with adult GAD relative to other anxiety disorders (Dugas et al., 2007), but high comorbidity across the childhood anxiety disorders (e.g., Kendall & Brady, 1995; Verduin & Kendall, 2003) and within the present AD sample precluded specific comparisons of children with “pure” GAD and children with other anxiety disorders.

Finally, all child forms were completed with the assistance of a research associate. It is possible that the child-report IUSC may perform differently when used in contexts requiring children—particularly younger children and children of lower reading abilities—to independently

complete questionnaires. In fact, despite the mostly favorable psychometric properties among 7–8 year olds in the present sample who completed forms with assistance, readability indices suggest that it would be misguided to have children below a third grade reading level independently complete the IUSC-self-report (i.e., Flesch-Kincaid Grade Level = 3.6; Flesch Readability Ease = 85.8).

Historically, conceptualizations of childhood anxiety disorders tended to be downward extensions of conceptualizations supported in adult populations, applied without developmental considerations or empirical evidence to indicate their appropriateness with children (Kendall, Lerner, & Craighead, 1984; Shirk 1999; Weisz & Weersing, 1999). Recent cognitive models of adult anxiety disorders have increasingly highlighted the role of negative beliefs about uncertainty (Dugas et al., 2004; 1998), and it has been suggested that IU may be a causal risk factor in the development of pathological worry (Dugas et al., 2004; Ladouceur et al., 2000), but research has yet to examine IU in child samples. The present findings suggest that the IUSC child-form (and to a lesser extent parent-form) demonstrates favorable psychometric properties for continuous measurement of children's ability to tolerate uncertainty, providing a tool for researchers to study key temporal relationships between childhood IU, chronic worry, and anxiety disorders, and the extent to which childhood IU confers vulnerability to the development of anxiety disorders.

## Acknowledgments

Funding/Support: This study is supported by NIH grant T32 MH016434 (Dr. Comer), NIMH Career Development Award (Dr. Roy; K23MH074821), APA Division 53 (Clinical Child and Adolescent Psychology) Graduate Student Research Grant (Dr. Comer), a Temple University Presidential Fellowship (Dr. Comer), and a grant from the Mental Health Initiative (MINT) (Dr. Comer).

## References

- Abela JRZ, Skitch SA, Auerbach RP, Adams PA. The impact of borderline personality disorder on vulnerability to depression in children of affectively-ill parents. *Journal of Personality Disorders* 2005;19:65–79.
- Abela JRZ, Zuroff DC, Ho M-HR, Adams P, Hankin BL. Excessive reassurance seeking, hassles, and depressive symptoms in children of affectively ill parents: A multiwave longitudinal study. *Journal of Abnormal Child Psychology* 2006;34:171–187. [PubMed: 16555142]
- Achenbach TM, McConaughy SH, Howell CT. Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin* 1987;101:213–232. [PubMed: 3562706]
- Baldwin JS, Dadds MR. Reliability and validity of parent and child versions of the Multidimensional Anxiety Scale for Children in community samples. *Journal of the American Academy of Child and Adolescent Psychiatry* 2007;46:252–260. [PubMed: 17242629]
- Borkovec TD, Robinson E, Pruzinsky T, DePree JA. Preliminary exploration of worry: Some characteristics and processes. *Behaviour Research and Therapy* 1983;21:9–18. [PubMed: 6830571]
- Buhr K, Dugas MJ. The Intolerance of Uncertainty Scale: Psychometric properties of the English version. *Behaviour Research and Therapy* 2002;40:931–945. [PubMed: 12186356]
- Chorpita BF, Tracey SA, Brown TA, Collica TJ, Barlow DH. Assessment of worry in children and adolescents: An adaptation of the Penn State Worry Questionnaire. *Behavior Research and Therapy* 1997;35:569–581.
- Choudhury MS, Pimentel SS, Kendall PC. Childhood anxiety disorders: Parent-child (dis)agreement using a structured interview for the DSM-IV. *Journal of the American Academy of Child and Adolescent Psychiatry* 2003;42:957–964. [PubMed: 12874498]
- Clark LA, Watson D. Constructing validity: Basic issues in scale development. *Psychological Assessment* 1995;7:309–319.

- Cohen J. A coefficient of agreement for nominal scales. *Educational and Psychological Measurement* 1960;20:37–46.
- Cohen, J. *Statistical Power Analysis for the Behavioral Sciences*. 2. Hillside, NJ: Erlbaum; 1988.
- Comer JS, Kendall PC. A symptom-level examination of parent-child agreement in the diagnosis of anxious youths. *Journal of the American Academy of Child and Adolescent Psychiatry* 2004;43:878–886. [PubMed: 15213589]
- Comer JS, Kendall PC. High-end specificity of the Children's Depression Inventory in a sample of anxiety-disordered youth. *Depression and Anxiety* 2005;22:11–19. [PubMed: 15965988]
- Dadds MR, Perrin S, Yule W. Social desirability and self-reported anxiety in children: An analysis of the RCMAS Lie Scale. *Journal of Abnormal Child Psychology* 1998;26:311–317. [PubMed: 9700522]
- De Los Reyes A, Kazdin AE. Informant discrepancies in the assessment of childhood psychopathology: A critical review, theoretical framework, and recommendations for further study. *Psychological Bulletin* 2005;131:483–509. [PubMed: 16060799]
- DiBartolo PM, Albano AM, Barlow DH, Heimberg RG. Cross-informant agreement in the assessment of social phobia in youth. *Journal of Abnormal Child Psychology* 1998;26:213–220. [PubMed: 9650627]
- Dugas, MJ.; Buhr, K.; Ladouceur, R. The role of intolerance of uncertainty in the etiology and maintenance of generalized anxiety disorder. In: Heimberg, RG.; Turk, CL.; Mennin, DS., editors. *Generalized Anxiety Disorder: Advances in Research and Practice*. New York: Guilford; 2004. p. 143-163.
- Dugas MJ, Gagnon F, Ladouceur R, Freeston MH. Generalized anxiety disorder: A preliminary test of a conceptual model. *Behaviour Research and Therapy* 1998;36:215–226. [PubMed: 9613027]
- Dugas MJ, Ladouceur R. Treatment of GAD: Targeting intolerance of uncertainty in two types of worry. *Behavior Modification* 2000;24:635–657. [PubMed: 11036732]
- Dugas MJ, Marchand A, Ladouceur R. Further validation of a cognitive-behavioral model of generalized anxiety disorder: Diagnostic and symptom specificity. *Journal of Anxiety Disorders* 2005;19:329–343. [PubMed: 15686860]
- Dugas, MJ.; Robichaud, M. *Cognitive-behavioral treatment for generalized anxiety disorder: From science to practice*. New York, NY: Routledge/Taylor & Francis Group; 2007.
- Dugas MJ, Savard P, Gaudet A, Turcotte J, Laugesen N, Robichaud M, Francis K, Koerner N. Can the components of a cognitive model predict the severity of generalized anxiety disorder? *Behavior Therapy* 2007;38:169–178. [PubMed: 17499083]
- Freeston MH, Rheaume J, Letarte H, Dugas MJ, Ladouceur R. Why do people worry? *Personality and Individual Differences* 1994;17:791–802.
- Fristad MA, Emery BL, Beck SJ. Use and abuse of the Children's Depression Inventory. *Journal of Consulting and Clinical Psychology* 1997;65:699–702. [PubMed: 9256572]
- Haynes SN, Richard DCS, Kubany ES. Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment* 1995;7:238–247.
- Holaway RM, Heimberg RG, Coles ME. A comparison of intolerance of uncertainty in analogue obsessive-compulsive disorder and generalized anxiety disorder. *Journal of Anxiety Disorders* 2006;20:158–174. [PubMed: 16464702]
- Joiner TE. A test of interpersonal theory of depression in youth psychiatric inpatients. *Journal of Abnormal Child Psychology* 1999;27:77–85. [PubMed: 10197408]
- Joiner TE, Metalsky GI, Gencoz F, Gencoz T. The relative specificity of excessive reassurance-seeking to depressive symptoms and diagnoses among clinical samples of adults and youth. *Journal of Psychopathology and Behavioral Assessment* 2001;23:35–41.
- Kendall, PC.; Brady, EU. Comorbidity in the anxiety disorders of childhood: Implications for validity and clinical significance. In: Craig, KD.; Dobson, KS., editors. *Anxiety and depression in adults and children*. Thousand Oaks, CA: Sage; 1995. p. 3-36.
- Kendall PC, Flannery-Shroeder EC. Rigor, but not rigor mortis, in depression research. *Journal of Personality and Social Psychology* 1995;68:892–894. [PubMed: 7776185]
- Kendall PC, Lerner RM, Craighead WE. Human development and intervention in childhood psychopathology. *Child Development* 1984;55:71–82. [PubMed: 6705634]

- Koerner N, Dugas MJ. An investigation of appraisals in individuals vulnerable to excessive worry: The role of intolerance of uncertainty. *Cognitive Therapy and Research* 2008;32:619–638.
- Kraemer HC, Kazdin AE, Offord DR. Coming to terms with the terms of risk. *Archives of General Psychiatry* 1997;54:337–343. [PubMed: 9107150]
- Krain AL, Gotimer L, Hefton Ernst M, Castellanos FX, Pine DS, Milham MP. A functional magnetic resonance imaging investigation of uncertainty in adolescents with anxiety disorders. *Biological Psychiatry* 2008;63:563–568. [PubMed: 17719566]
- Krain AL, Hefton S, Pine DS, Ernst M, Castellanos FX, Klein RG, Milham MP. An fMRI examination of developmental differences in the neural correlates of uncertainty and decision-making. *Journal of Child Psychology and Psychiatry* 2006;47:1023–1030. [PubMed: 17073981]
- Ladouceur R, Gosselin P, Dugas MJ. Experimental manipulation of intolerance of uncertainty: A study of a theoretical model of worry. *Behaviour Research and Therapy* 2000;38:933–941. [PubMed: 10957827]
- March, JS.; Albano, AM. New developments in assessing pediatric anxiety disorders. In: Ollendick, T.; Prinz, R., editors. *Advances in clinical child psychology*. Vol. 20. New York: Plenum Press; 1998.
- March JS, Parker J, Sullivan K, Stallings P, Conners C. The Multidimensional Anxiety Scale for Children (MASC): Factor structure, reliability and validity. *Journal of the American Academy of Child and Adolescent Psychiatry* 1997;36:554–565. [PubMed: 9100431]
- March JS, Sullivan K, Parker J. Test-retest reliability of the Multidimensional Anxiety Scale for Children. *Journal of Anxiety Disorders* 1999;13:349–358. [PubMed: 10504106]
- March JS, Sullivan K. Test-retest reliability of the Multi-dimensional Anxiety Scale for Children. *Journal of Anxiety Disorders* 1999;13:349–358. [PubMed: 10504106]
- Matthey S, Petrovski P. The Children's Depression Inventory: Error in cutoff scores for screening purposes. *Psychological Assessment* 2002;14:146–149. [PubMed: 12056076]
- Meyer TJ, Miller ML, Metzger RL, Borkovec TD. Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy* 1990;28:487–495. [PubMed: 2076086]
- Muris P, Meesters C, Gobel M. Reliability, validity, and normative data of the Penn State Worry Questionnaire in 8–12-yr-old children. *Journal of Behavior Therapy and Experimental Psychiatry* 2001;32:63–72. [PubMed: 11764062]
- Norton PJ. A psychometric analysis of the Intolerance of Uncertainty Scale among four racial groups. *Journal of Anxiety Disorders* 2005;19:699–707. [PubMed: 15927782]
- Pestle SL, Chorpita BF, Schiffrman J. Psychometric properties of the Penn State Worry Questionnaire for Children in a Large Clinical Sample. *Journal of Clinical Child and Adolescent Psychology* 2008;37:465–471. [PubMed: 18470782]
- Riskind JH, Alloy LB. Cognitive vulnerability to psychological disorders: Overview of theory, design, and methods. *Journal of Social and Clinical Psychology* 2006;25:705–725.
- Shirk, SR. Developmental therapy. In: Silverman, WK.; Ollendick, TH., editors. *Developmental issues in the clinical treatment of children*. Boston: Allyn and Bacon; 1999. p. 60-74.
- Silverman, W.; Albano, AM. DSM-IV. San Antonio: Psychological Corporation; 1996. *The Anxiety Disorders Interview Schedule for Children*.
- Silverman WK, Ollendick TH. Evidence-based assessment of anxiety and its disorders in children and adolescents. *Journal of Clinical Child and Adolescent Psychology* 2005;34:380–411. [PubMed: 16026211]
- Silverman WK, Saavedra LM, Pina AA. Test-retest reliability of anxiety symptoms and diagnoses with the Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Versions. *Journal of the American Academy of Child & Adolescent Psychiatry* 2001;40:937–944. [PubMed: 11501694]
- Silverstein ML, Nelson LD. Clinical and research implications of revising psychological tests. *Psychological Assessment* 2000;12:298–303. [PubMed: 11021153]
- Verduin TL, Kendall PC. Differential occurrence of comorbidity within childhood anxiety disorders. *Journal of Clinical Child and Adolescent Psychology* 2003;32:290–295. [PubMed: 12679288]
- Weisz, JR.; Weersing, VR. Developmental outcome research. In: Silverman, WK.; Ollendick, TH., editors. *Developmental issues in the clinical treatment of children*. Boston: Allyn and Bacon; 1999. p. 457-469.

- Wood JJ, Piacentini JC, Bergman RL, McCracken J, Barrios V. Concurrent validity of the anxiety disorders section of the Anxiety Disorders Interview Section for DSM-IV: Child and Parent Versions. *Journal of Clinical Child and Adolescent Psychology* 2002;31:335–342. [PubMed: 12149971]
- Zweig MH, Campbell G. Receiver-operating characteristic (ROC) plots: A fundamental evaluation tool in clinical medicine. *Clinical Chemistry* 1993;39:561–577. [PubMed: 8472349]



**Table 1**

Demographic characteristics of AD and COM youth across the two data collection sites

	AD youth			COM youth		
	Site 1	Site 2	Total	Site 1	Site 2	Total
N	48	25	73	90	34	124
Gender, % girls	45.7	62.5	52.5	47.8	55.9	50.0
Age, mean (SD)	11.7 (3.3)	12.4 (2.8)	11.9(3.1)	10.8 (2.0)	12.8 (2.5)	11.4 (2.4)
Annual household income, N						
<\$29,999	6	3	9	17	10	17
\$30,000–59,999	17	8	25	36	9	45
\$60,000–79,999	7	3	10	19	6	25
>\$80,000	18	10	28	18	9	27

Note: AD=youth with diagnosed anxiety disorders; COM=non-referred community youth; Site 1= Temple University; Site 2 = NYU

**Table 2**

## Means and Standard Deviations of Study Variables

	COM youth (N= 124)	AD youth (N =73)	Full sample (N= 197)
IUSC (parent-report)	45.60(16.5)	65.79 (22.9)	52.33 (21.1)
IUSC (child-report)	52.81 (18.0)	64.97 (21.7)	55.71 (19.6)
MASC total T-score <sup>a</sup>	48.90 (10.4)	56.97 (14.0)	51.13 (12.0)
PSWQ-C	11.79 (5.9)	23.84 (9.3)	19.29 (10.2)
RSSC	5.13 (1.7) <sup>b</sup>	+	+

Note: IUSC = Intolerance of Uncertainty Scale for Children; MASC = Multidimensional Anxiety Scale for Children; PSWQ-C = Penn State Worry Questionnaire for Children; RSSC = Reassurance-Seeking Scale for Children.

<sup>+</sup> RSSC not administered in AD sample.

<sup>a</sup> 6.5% of COM youth (N = 8) had MASC total T-scored  $\geq 65$ ; 50.7% of AD youth (N =37) had MASC Total T-score  $\geq 65$ .

<sup>b</sup> Data reflect calculations from subset (n = 90) of COM youth administered the RSSC.

**Table 3**

## Zero-order Correlations between Study Variables

	IUSC (parent-report)	IUSC (child-report)	MASC	PSWQ-C
IUSC (child-report)	.16	-	-	-
MASC	.30***	.71***	-	-
PSWQ-C	.49***	.75***	.67***	-
RSSC <sup>a</sup>	.11	.47***	.35***	.30***

*Note:* IUSC = Intolerance of Uncertainty Scale for Children; MASC = Multidimensional Anxiety Scale for Children; PSWQ-C = Penn State Worry Questionnaire for Children; RSSC = Reassurance-Seeking Scale for Children.

<sup>a</sup>Data reflect calculations from subset ( $n = 90$ ) of COM youth administered the RSSC.

\*\*\*  
 $P < .005$ .

**Table 4**

Partial Correlations between Study Variables (Controlling for Child Age)

	IUSC (parent-report)	IUSC (child-report)	MASC	PSWQ-C
IUSC (child-report)	.17	-	-	-
MASC	.30***	.69***	-	-
PSWQ-C	.50***	.75***	.68***	-
RSSC <sup>a</sup>	.13	.42***	.29***	.29***

*Note:* IUSC = Intolerance of Uncertainty Scale for Children; MASC = Multidimensional Anxiety Scale for Children; PSWQ-C = Penn State Worry Questionnaire for Children; RSSC = Reassurance-Seeking Scale for Children.

<sup>a</sup>Data reflect calculations from subset (n = 90) of COM youth administered the RSSC.

\*\*\*  
p < .005.

Table 5

Classification Properties of the IUSC Parent- and Child-report Forms for Cut Scores in which Sensitivity and Specificity are Both > .50

IUSC cut score	Child-report form						Parent-report form							
	Sensitivity	Specificity	PPP	NPP	Selection Ratio	Kappa	OCC	Sensitivity	Specificity	PPP	NPP	Selection Ratio	Kappa	OCC
70	.55	.90	.85	.67	.33	.45	.73	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
69	.55	.85	.79	.65	.35	.40	.70	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
68	.55	.85	.79	.65	.35	.40	.70	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
67	.55	.85	.79	.65	.35	.40	.70	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
66	.55	.85	.79	.65	.35	.40	.70	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
65	.55	.85	.79	.65	.35	.40	.70	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
64	.60	.85	.80	.68	.38	.45	.73	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
63	.60	.85	.80	.68	.38	.45	.63	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
62	.60	.85	.80	.68	.38	.45	.73	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
61	.60	.85	.80	.68	.38	.45	.73	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
60	.65	.80	.77	.70	.43	.45	.63	.55	.65	.58	.59	.45	.20	.60
59	.75	.75	.75	.75	.50	.50	.75	.55	.60	.58	.57	.48	.15	.58
58	.75	.70	.71	.74	.53	.45	.73	.60	.60	.60	.60	.50	.20	.60
57	.75	.70	.71	.74	.53	.45	.73	.60	.60	.60	.60	.50	.20	.60
56	.75	.70	.71	.74	.53	.45	.73	.60	.60	.60	.60	.50	.20	.60
55	.75	.70	.71	.74	.53	.45	.73	.70	.55	.61	.65	.58	.25	.63
54	.80	.70	.73	.78	.55	.50	.73	.70	.55	.61	.65	.58	.25	.63
53	.80	.70	.73	.78	.55	.50	.75	.70	.55	.61	.65	.58	.25	.63
52	.80	.70	.73	.78	.55	.50	.75	.70	.55	.61	.65	.58	.25	.63
51	.80	.70	.73	.78	.55	.50	.75	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
50	.80	.70	.73	.78	.55	.50	.75	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
49	.80	.60	.67	.75	.60	.40	.70	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
48	.80	.55	.64	.73	.63	.35	.68	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>

Note. IUSC = Intolerance of Uncertainty Scale for Children; PPP = Positive Predictive Power; NPP = Negative Predictive Power; Selection Ratio = percentage scoring at or above cut score (note: does not reflect rate of "true" AD); Kappa = agreement between IUSC and ADIS-C/P after correcting for chance; OCC = Overall Correct Classification.



<sup>a</sup>Sensitivity for parent-report cut scores above 59 were  $\leq .50$ . Classification properties are reported in table only for cut scores in which associated sensitivity and specificity are both  $> .50$ .

<sup>b</sup>Specificity for parent-report cut scores below 52 were  $\leq .50$ . Classification properties are reported in table only for cut scores in which associated sensitivity and specificity are both  $> .50$ .

## Appendix

### The Intolerance of Uncertainty Scale for Children (IUSC), Parent- and Child-report Forms

Item	Parent-report form	Child-report form
1	Uncertainty stops my child from having strong opinions	Doubts stop me from having strong opinions
2	My child believes that being uncertain means one is mixed-up	Being unsure means that a person is mixed-up
3	Uncertainty makes my child's life intolerable	Not knowing what will happen in the future makes life hard
4	My child thinks it's unfair that we can't predict the future	It's not fair that we can't predict the future
5	My child's mind can't be relaxed if he/she doesn't know what will happen tomorrow	I can't relax if I don't know what will happen tomorrow
6	Uncertainty makes my child uneasy, anxious, or stressed	Not knowing what will happen in the future makes me uneasy, anxious, or stressed
7	Unforeseen events upset my child greatly	Surprise events upset me greatly
8	It frustrates my child to not have all the information he/she needs in a situation	It frustrates me to not have all of the information I need
9	Uncertainty keeps my child from living a full life	Not knowing what could happen keeps me from enjoying life
10	My child believes that one should always look ahead so as to avoid surprises	One should always think ahead to avoid surprises
11	My child believes that a small unforeseen event can spoil everything, even with the best planning	Plans can be ruined by things you didn't think would happen.
12	When it's time to act, uncertainty paralyzes my child	When it is time to do things, not knowing what could happen keeps me from acting
13	My child believes that being uncertain means that he/she is not first rate	Being unsure of things means that I am not great
14	When my child is uncertain he/she can't go forward	When I am not sure of something I can't go forward
15	When my child is uncertain he/she can't function very well	When I am not sure of something I can't work very well
16	Other children seem to be more certain than my child	Other kids have less doubts than I do
17	Uncertainty makes my child unhappy or sad	Not knowing what will happen makes me unhappy or sad
18	My child always wants to know what the future has in store for him/her	I always want to know what will happen to me in the future
19	My child can't stand being taken by surprise	I don't like being taken by surprise
20	The smallest doubt can stop my child from acting	The smallest doubt can stop me from doing things
21	My child feels as though he/she should be able to organize everything in advance	I should be able to prepare for everything in advance
22	My child feels as though being uncertain means that he/she lacks confidence	Being unclear about things means that I am not confident
23	My child feels as though it's unfair that other people seem to be sure about their future	It's not fair that other kids are more sure of things
24	Uncertainty keeps my child from sleeping soundly	Not knowing what can happen keeps me from sleeping well
25	My child tries to get away from all uncertain situations	I must get away from all situations where I don't know what will happen
26	The ambiguities of life stress my child	Things that are unclear stress me
27	My child can't stand being undecided about the future.	I don't like being undecided about the future.

*Note.* Respondents rate the extent to which they agree with each item along a 5-pt scale (1=*not at all*, 3=*somewhat*, and 5=*very much*).