University of Northern Iowa
UNI ScholarWorks

Honors Program Theses | Student Work

2005

Psychometric Characteristics of the Multidimensional Anxiety Scale for Children in Adolescent Samples

Nicole Carlson

Let us know how access to this document benefits you

Copyright
Follow this and additional works at: https://scholarworks.uni.edu/hpt

PSYCHOMETRIC CHARACTERISTICS OF THE MULTIDIMENSIONAL ANXIETY SCALE FOR CHILDREN IN ADOLESCENT SAMPLES

A Thesis

Submitted

in Partial Fulfillment

of the Requirements for the Designation

University Honors with Distinction

Nicole Carlson

University of Northern Iowa

May 2005

This Study by: Nicole Carlson

Entitled: Psychometric Characteristics of the Multidimensional Anxiety Scale for Children in Adolescent Samples

has been approved as meeting the thesis or project requirement for the Designation University Honors with Distinction.

5/5/05
Date

Augustine Osman, Ph.D., ABAP, Honors Thesis Advisor

5/16/05
Date

Jessica Moon, Director, University Honors Program

Psychometric Characteristics of the Multidimensional Anxiety Scale for Children in Adolescent Samples

Most children and adolescents, on any given day, experience some levels of anxiety. They worry about school, about friendships, and about their physical appearance. For most children and adolescents, these worries are considered a normal part of growing older. In some cases, these worries take control over the child's life and seriously affect the normal developmental process. When the symptoms of anxiety become excessive and debilitating, a person may be diagnosed with an anxiety disorder. In the child and adolescent literature, the three primary internalizing disorders are anxiety disorders, somatization disorders, and depressive disorders. This paper focuses on the anxiety disorders.

Anxiety is an adaptive emotion, meaning that a moderate amount of anxiety is actually beneficial (Mash & Wolfe, 2002). Moderate levels of anxiety help people think and act more effectively; however, high levels of anxiety-related symptoms my cause significant distress and impairment. People experiencing high levels of anxiety focus more on thoughts of failure than on the task at hand. Their ability to concentrate is also weakened (Mash & Wolfe, 2002).

Anxiety disorders are characterized by excessive and debilitating negative affect and physical symptoms of tension. Symptoms of anxiety exist on three domains: physical, cognitive, and behavioral. Physical symptoms of anxiety include increased heart rate and perspiration, blushing, and muscle tension. Cognitive symptoms of anxiety include thoughts of bodily harm, thoughts of failure, and thoughts of being scared. Behavioral symptoms of anxiety may include avoidance, crying, and immobility (Mash & Wolfe, 2002).

It is important to distinguish anxiety from fear, as the two are often confused. On the one hand, fear is an immediate alarm reaction, is present-oriented, and involves a specific object. On

the other hand, anxiety is an anticipatory response, is future-oriented, and may or may not involve a specific object (Mash & Wolfe, 2002). It is often best to think of anxiety disorders as belonging to two categories: anxiety states and phobic disorders. Anxiety states tend to involve feelings of anxiety, whereas phobic disorders generally involve feelings of fear.

Anxiety Disorders

The current Diagnostic and Statistical Manual of Mental Disorders (*DSM-IV-TR*; American Psychiatric Association, 2000) identifies nine different anxiety disorders. The nine anxiety disorders include separation anxiety disorder (SAD), generalized anxiety disorder (GAD), specific phobias, social phobia, obsessive-compulsive disorder (OCD), panic disorder (PD), panic disorder with agoraphobia, posttraumatic stress disorder (PTSD), and acute stress disorder. GAD, OCD, PTSD, acute stress disorder, and both panic disorders are considered anxiety states. The remaining three disorders – social phobia, specific phobias, and SAD – are considered phobic anxiety disorders. Each disorder is briefly described below.

Separation Anxiety Disorder

Separation anxiety disorder is the most common anxiety-based disorder for children. The *DSM-IV-TR* (APA, 2000) recognizes SAD as one of the earliest occurring anxiety disorders. Children with SAD fear being apart from their parents or away from home. These fears must be age-inappropriate, excessive, debilitating, and last for at least four weeks. SAD is equally common in both boys and girls, and it is often comorbid with other anxiety disorders such as GAD and somatic complaints. SAD is also frequently associated with school refusal behavior (Last, Hersen, Kazdin, Orvaschel, & Perrin, 1991; Mash & Wolfe, 2002).

Generalized Anxiety Disorder

The essential symptom for generalized anxiety disorder is excessive worry. This worry is uncontrollable and chronic or exaggerated, and is often accompanied by physical symptoms for at least six months. Those with GAD worry about a wide variety of events or activities such as family, health, and school on most days. Because these children then underestimate their own ability, they tend to be overly conforming in interpersonal situations. As with most internalizing disorders, more girls than boys present with GAD.

Specific Phobias

Specific phobias are characterized by the extreme and disabling fear of a specific object or situation. The *DSM-IV-TR* (APA, 2000) also recognizes specific phobias as one of the earliest occurring anxiety-related disorders. Unlike adults, younger children may not recognize that their fears are unreasonable. Those diagnosed with specific phobias actively avoid the object that they fear. If exposed to the phobic stimulus, younger children frequently engage in avoidance behavior. Specific phobias are more common in girls than in boys, however a small number of those with specific phobias actually seek treatment (Mash & Wolfe, 2002).

Social Phobia

Social phobia is characterized by the fear of negative evaluation (i.e., being teased, laughed at, or made fun of) in social situations. The greatest impact of this disorder is placed on peer interactions. Like those with specific phobias, individuals with social phobia actively avoid situations that require performance or any other social interactions. Social phobias generally develop after puberty, when most teens begin to experience higher levels of self-consciousness, social pressure, and peer acceptance (Beidal, Turner, & Morris, 1999). Gender differences in the prevalence of social phobia are slight, with girls experiencing the disorder a little more than boys

(Inderbitzen-Nolan & Walters, 2000; Mash & Wolfe, 2002). The current *DSM* identifies two subtypes of social phobia: the generalized subtype is pervasive across most social situations, and the specific situational subtype is limited to performance situations. Younger children and adolescents, in general, tend to present with the severe form of generalized social phobia (see e.g., Hoffman et al., 1999).

Obsessive-Compulsive Disorder

Children and adolescents with obsessive-compulsive disorder repeatedly experience unwanted and intrusive thoughts (obsessions) that are often accompanied by ritualized behaviors (compulsions). Obsessions (e.g., fears of performing a violent act) are excessive and irrational. Compulsions (e.g., collecting useless items) are performed with the intention to reduce the anxiety caused by the obsessions. OCD has a chronic clinical course – over half of those diagnosed with OCD during childhood will continue to have the disorder during early adulthood (Zohar & Bruno, 1997). Prevalence rates among boys and girls tend to be similar for OCD (Mash & Wolfe, 2002).

Panic Disorder

Panic disorder is associated with the repeated unexpected experience of panic attacks and the persistent worry of having a panic attack. A panic attack is acute, occurs suddenly, and is characterized by intense physical and cognitive symptoms such as rapid heartbeat and feeling like one is dying. Each attack typically lasts for 10 minutes. Girls are more likely than boys to be diagnosed with panic disorder (Mash & Wolfe, 2002).

Panic Disorder with Agoraphobia

Panic disorder with agoraphobia has the same criteria as explained above, but also includes the fear of certain public places or situations (agoraphobia). Commonly, the places or

situations that are avoided are those in which a panic attack had occurred. Agoraphobia usually does not develop until the age of 18 (Mash & Wolfe, 2002). The symptoms of panic disorder with agoraphobia, when seen in youths, are expressed in terms of shortness of breath, extreme changes in temperature, and nausea (see e.g., Kearney, Albano, Elsen, Allan, & Barlow, 1997).

Posttraumatic Stress Disorder

Posttraumatic stress disorder occurs after experiencing a traumatic episode or event, as the name implies. PTSD entails the persistence of frightening thoughts of the event and symptoms of extreme arousal that last for one month or more. Those with PTSD often avoid stimuli that are associated with the traumatic event. More girls than boys tend to present with PTSD. The current *DSM-IV-TR* (APA, 2000) suggests that youngsters with a diagnosis of PTSD can respond with disorganized or agitated behavior patterns.

Acute Stress Disorder

Acute stress disorder is similar to PTSD is all instances except the length of time of the disorder. As previously mentioned, PTSD symptoms must be present for at least one month for a PTSD diagnosis. Acute stress disorder develops within one month of the traumatic event and thus has an earlier onset than PTSD. Girls tend to have higher prevalence rates for acute stress disorder than boys do.

Prevalence and Comorbidity

Anxiety disorders are some of the most common mental health disorders in young people. Prevalence rates for most anxiety disorders range from 1% to 4 % of all children (Bernstein, Borchardt, & Perwein, 1996; Essau, Conradt, & Petermann, 1999; Essau, Conradt, & Petermann, 2000; Mash & Wolfe, 2002; Ollendick, Mattis, & King, 1994), with the exception of two disorders. SAD has a prevalence rate of about 10% in all children (Last, Perrin, Hersen, &

Kazdin, 1992) and GAD has prevalence rates ranging from 3% to 6% of all children (Mash & Wolfe, 2002). Overall, girls tend to have higher prevalence rates than boys, but this age difference does not emerge until about the age of 14 (Austin & Chorpita, 2004; Bernstein et al., 1996).

Anxiety disorders and depressive disorders tend to occur together. For example, major depressive disorder and SAD occur together in about one-third of all clinic adolescents (Mash & Wolfe, 2002). In general, anxiety disorders tend to occur before the depressive disorders. Anxiety disorders are often comorbid with other psychological disorders such as conduct disorder and oppositional defiant disorder (Osman et al., 2002).

Complications Associated with Anxiety Disorders

Adolescents who experience major anxiety disorders often tend to report problems related to academic tasks (Mash & Wolfe, 2002). Bernstein et al. (1996) found that children with elevated levels of anxiety were 7.7 times more likely to be in the lowest quartile of reading achievement and 2.4 times more likely to be in the lowest quartile of math achievement. Other problems include low self-esteem, loneliness, social maladjustment, learning difficulties, and even physical illness (Casper, Belanoff, & Offer, 1996; Mash & Wolfe, 2002). In some cases, adolescents may even begin to abuse substances in an attempt to self-medicate (Casper et al., 1996).

When chronic, anxiety-related disorders also tend to persist into adulthood (Ollendick & King, 1994). Pine, Cohen, Gurley, Brook, and Ma (1998) found that most adult anxiety disorders were preceded by anxiety disorders in adolescence. In another study, Bernstein et al. (1996) found that the remission rate for most anxiety disorders after a 4- to 5-year follow-up was 77%,

with 30% of those children and adolescents developing another psychological disorder during that time period.

Importance of Assessment and Screening of Anxiety

Despite their frequency and developmental impact, professionals and paraprofessionals often have difficulty recognizing the essential symptoms or negative impacts of these anxiety disorders. Indeed, most of the symptoms exhibited by adolescents with anxiety-related disorders are internal, and therefore go unnoticed by many parents and teachers. Adolescents also have very low self-referral rates (Reynolds, 2002). Younger children may not be able to provide verbal descriptions of these symptoms such as in PTSD (see e.g., Scheeringa & Zeanah, 1995).

Psychometrically sound self-report instruments are essential for detecting anxiety disorders in young children and adolescents. The majority of the anxiety measures for children and adolescents currently in use are adaptations of adult measures (March, Sullivan, & Parker, 1999; Perrin & Last, 1992). These anxiety measures were also developed before the revised third edition of the Diagnostic and Statistical Manual of Mental Disorders (*DSM-III-R*, American Psychiatric Association, 1987), which included a section describing anxiety disorders of childhood and adolescence, unlike the previous editions of the DSM. These anxiety measures include the Fear Survey Schedule for Children-Revised (FSSC-R; Ollendick, 1983), the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978), and the State-Trait Anxiety Inventory for Children (STAIC; Spielberger, Gorsuch, & Luchene, 1976). These measures also have poor discriminant validity, that is their ability to discriminate between those children and adolescents with anxiety and those with other forms of psychopathology or with no psychopathology is poor (March et al., 1999; Perrin & Last, 1992).

The Social Phobia and Anxiety Inventory for Children (SPAI-C; Beidel, Turner, & Morris, 1995) is another popular measure. The SPAI-C was developed specifically for use with children, but the focus of the inventory is only on assessing social phobia. An instrument that was developed specifically for use with children and was designed to measure a broad-range of anxiety-related symptoms is necessary for screening purposes.

The current popular anxiety measures for children and adolescents have many limitations. To summarize, most of these anxiety measures were adapted from adult versions. They were developed before the publication of the *DSM-III-R*. These anxiety measures are also mostly specific. The Multidimensional Anxiety Scale for Children (MASC; March 1997a) was developed to address this need in the anxiety literature.

The Multidimensional Anxiety Scale for Children

The Multidimensional Anxiety Scale for Children (MASC; March, 1997a) is a 39-item self-report measure intended for assessing a wide range of anxiety-related symptoms. The MASC is a Likert-type scale, with response ratings ranging from 0 (never true about me) to 3 (often true about me). The scale can be used to assess children and adolescents ranging in age from 8 to 19 years. Because the scale requires a fourth-grade reading level, a trained interviewer should assist children under the age of 10. The scale is fairly easy to administer, and can be completed in only about 15 minutes by most children and adolescents. Higher scores on the MASC scales indicate higher levels of anxiety.

The MASC is not intended to provide a diagnosis. When making diagnoses, a clinician should use the MASC as part of the clinical assessment. In an attempt to address some of the limitations of other scales measuring anxiety, March developed the MASC specifically for children and used the DSM criteria for childhood anxiety-related disorders when generating

items. Another advantage of the MASC over existing measures of anxiety is the extensive use of contemporary psychometric procedures during the development of the scale.

Development of the MASC.

March and his colleagues began developing the MASC by selecting items from existing anxiety measures and from the *DSM-III-R* (APA, 1987). Experts then divided the items into four domains: emotional, cognitive, physical, and behavioral. The researchers then reduced the item pool to 41 items by removing items that were redundant, hard to read, or irrelevant to children and adolescents. These 41 items were administered to 4th through 8th graders, and then an exploratory factor analysis was conducted. Five factors emerged, but the items were not distributed evenly, ranging from 4 items on one factor to 14 items on another factor. There were also low internal reliability estimates for the factors. The researchers were not satisfied with the results, so development continued.

After items were added, there were 104 items in the pool. These items were administered to a different sample of 8 through 17 year olds. A series of exploratory principal components factor analyses of the item pool were conducted, resulting in a four-factor model with 39 items. Additional factor analyses were conducted with items within each factor, and 3 of the 4 factors were further divided into 2 factors. Items loaded fairly evenly across the factors. Each factor had relatively strong internal reliability estimates. Because of their strong psychometric properties, these factors (i.e., the 4 main factors and the 6 subfactors) were adopted as the scales and subscales on the MASC.

Structure of the MASC

The MASC is composed of 4 scales, 6 subscales, and 2 indexes. The 4 scales include the Physical Symptoms Scale (PS), the Harm Avoidance Scale (HA), the Social Anxiety Scale (SA),

and the Separation/Panic Scale (SEP). The PS Scale is made up of 12 items and has 2 subscales: the Tense Symptoms Subscale (6 items) and the Somatic Symptoms Subscale (6 items). The PS scale measures the physical symptoms of anxiety and differentiates between somatic symptoms and tensions symptoms. The HA Scale is composed of 9 items and has 2 subscales: the Perfectionism Subscale (4 items) and the Anxious Coping Subscale (5 items). The HA scale measures one's desire to do everything right (perfectionism) and to make sure things are safe (anxious coping symptoms). The SA Scale is also composed of 9 items and also has 2 subscales: the Humiliation Fears Subscale (5 items) and the Performance Fears Subscale (4 items). The SA scale measures fears of performing and of being humiliated. The remaining 9 items define the SEP Scale, which measures separation anxiety and panic.

The 2 indexes are the Anxiety Disorders Index (ADI; 10 items) and the Inconsistency Index (16 items). The ADI is intended to identify children and adolescents who will probably be diagnosed with an anxiety disorder. After the development of the scales and subscales, the March and his colleagues conducted independent sample *t*-tests in order to find items that differentiated between clinical samples and nonclinical samples. The analyses identified 10 items that did so meaningfully and they now form the ADI. The Inconsistency Index is a validity measure intended to assess response consistency. There are eight pairs of items on the MASC that have similar content. These eight pairs are used to measure response inconsistency. High scores on this index are often due to a respondent's random response patterns, lack of motivation, or misunderstanding of an item. Because this index is a validity measure and it does not assess levels of anxiety symptoms, analyses in this study did not include the Inconsistency Index.

Scoring and Interpretation of the Scores

The MASC results in a total of 13 scale scores: one score for each scale, subscale, and index and one total score for the whole scale. Using the QuickScore™ form included in the MASC kit or the MASC Computer Program for Windows™, scores can be computed quickly and easily. Any items that are left blank should be scored as "0." There are separate norms for boys and girls and for different age ranges. There are three different age ranges: 8 to 11 years old, 12 to 15 years old, and 16 to 19 years old. The manual includes sample profile forms to use when interpreting the scores. Scores should be interpretated at both the item- and the scale-level using the appropriate gender and age ranges. Before scores are interpreted, the validity of the responses should be assessed by analyzing responses on the Inconsistency Index.

Reliability of the MASC

The reliability estimates of most of the MASC scales tend to be strong. The Harm Avoidance scale and the Anxiety Disorders Index consistently have alpha estimates in the upper .60s. This is not a concern for the ADI because the index is composed of items measuring different anxiety disorders. However, the fact that the HA scale almost always has alpha estimates below .70 is a concern (March, 1997a). These low reliability estimates suggest that the HA scale is not composed of homogenous items. It is possible that this scale combines protective measures (e.g., Item 32: "If I get upset or scared, I let someone know right away") and actual measures of anxiety (e.g., Item 25: "I stay away from things that upset me"). Also, items on the HA scale are sometimes ambiguous because of lack of content (e.g., Item 5: "I keep my eyes open for danger"). A few studies, however, have found alpha estimates $\geq$.70 for all the scales on the MASC (Dierker et al., 2001; March, Parker, Sullivan, Stallings, & Conners, 1997).

The mean inter-item correlations for the 12 to 15 year-old norms were all in the low range, with only the Tense Symptoms subscale and the Humiliation Fears subscale scores in the desired range (i.e., values greater than .40). These low values suggest that the scales may not be unidimensional. More research needs to be conducted to examine the dimensionality of the Tense Symptoms subscale and the Humiliation Fears subscale.

Validity of the MASC

A limited number of factor analytic studies have been conducted that support the factor structure of the MASC (see March, 1997a; March et al., 1997). These studies conducted exploratory principal components factor analyses and were able to replicate the structure of the MASC. Confirmatory factor analyses were also conducted, and the four-factor model has consistently been found to have the best fit to the data (March, 1997a; March et al., 1997).

The Anxiety Disorders Index has also demonstrated contrasted groups validity evidence. In a study comparing the discriminant validities of a number of different anxiety scales, a group of researchers found that the MASC, and the ADI in particular, had the best discriminant validity estimates (Dierker et al., 2001).

Gender Differences on the MASC

According to the manual for the MASC, females scored higher on all the MASC scale scores than boys. The magnitudes of these differences were not discussed in the manual. Other validational studies involving the MASC have found the same results, but the absolute magnitudes of these differences were generally small (March et al., 1997; March et al., 1999).

Uses of the MASC

The MASC can be used in a variety of settings, such as research or clinical settings. It can also be used as a screening device in schools, mental health clinics, and juvenile detention

centers – anywhere screening of anxiety needs to be conducted. The MASC can also be used to monitor treatment progress, however, users need to keep in mind that the MASC is not recommended as the sole source of information in the clinical assessment of anxiety-related disorders.

The present investigation was an attempt to examine the psychometric properties of the MASC. The specific aims were as follows: 1) to examine the factor structure, reliability, and validity of the MASC, 2) to evaluate gender differences on the MASC total and scale scores, and 3) to examine the extent to which scale scores on the MASC correlate with scale scores on a well-established measure of depression.

This study was conducted in two phases. Phase 1 involved the analysis of the factor structure of the MASC items. Phase 2 involved the analyses of the reliability and validity of scores on the MASC scales. The University of Northern Iowa's Institutional Review Board approved this study before implementation.

Phase 1: Factor Structure of the MASC – Item level Analysis

Method

Participants and Procedure

Psychiatric Inpatient Sample. The participants were 215 psychiatric inpatient adolescents, ranging in age from 11 to 17 (mean age = 14.89 years, $SD = 1.55$), at the Mental Health Institute (MHI) in Independence, Iowa. Of the 215 participants, 108 were boys and 107 were girls. Boys (mean age = 14.73 years, $SD = 1.77$) and girls (mean age = 15.05 years, $SD = 1.28$) did not differ in terms of age, $t(213) = 1.49$, $p = .14$. The majority of the inpatient adolescents were Caucasian (86.5%), whereas 5.1% were African American, 1.9 % were Asian

American, 2.8% were Hispanic/Latino, 0.5% were American Indian/Alaska Native, 2.3% were some other race, and 0.9% were biracial.

Reviews of the medical records identified participants with primary *DSM-IV-TR* diagnoses that included attention-deficit/hyperactivity disorder (7.0%), adjustment disorder (4.7%), bipolar disorder (2.3%), conduct disorder (40.0%), depression (13.5%), impulsivity disorder (.5%), oppositional defiant disorder (25.1%), posttraumatic stress disorder (3.3%), and substance abuse disorder (3.7%).

Participants were administered the Multidimensional Anxiety Scale for Children (MASC; March, 1997a) as part of their intake evaluation. The MASC was also administered before discharge from the unit. Participants were at various stages in their treatment: some were receiving treatment whereas some were not receiving treatment.

Consent for participation was received upon admission to the children's unit at MHI. Assessment was conducted in a highly structured school setting. Each participant completed the scales under the supervision of a trained undergraduate research assistant on an individual basis. If requested by the participant, each questionnaire was read aloud by the research assistant.

Results and Discussion

Factor Structure of the MASC

For Phase 1, an exploratory factor analysis (EFA) was conducted to examine the factor structure of the MASC in an independent sample. All the analyses were conducted at the item level using all 39 items of the MASC. Initial analyses focused on evaluating the adequacy of the sample size and determining the number of factors to extract. The Kaiser-Meyer-Olkin measure of sampling adequacy estimate was used to evaluate adequacy of the sample for the EFA. Values of .80 and above are considered adequate. Both the scree plot and the eigenvalues greater than

1.0 criteria were used to determine the number of factors to extract. Because we expect low to moderate correlations among the factors, the oblique rotation method was used to rotate the factors. The principal-axis factoring method was used to extract the factors because we had no plan to drop items from the scale. Cronbach's alpha was also computed for each factor to examine the internal consistency of the items.

Results of the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO = .87) for the MASC indicated that the matrix was appropriate for further analysis. Both the eigenvalues greater than 1.0 and the scree plot suggested that four factors should be extracted. Results are shown in Table 1. Factor 1 (Physical Symptoms) is defined by 13 items. Those 13 items accounted for 25.51% of the variance. Factor 2 (Social Anxiety) is defined by 10 items. Those 10 items accounted for 5.26% of the variance. Factor 3 (Harm Avoidance) is defined by 7 items. Those 7 items accounted for 5.10% of the variance. Factor 4 (Separation/Panic) is defined by 9 items. Those 9 items accounted for 3.04% of the variance. Together, the four factors accounted for 38.91% of the total variance of anxiety. Generally, the percent of total variance accounted for by scores on a self-report instrument should be 40% or greater to be considered clinically useful. The MASC accounted for only about 39% of the total variance of anxiety; but as noted previously, the MASC is not intended to be used on its own. March clearly states in the manual that the MASC should be used in addition to other forms of assessment such as structured clinical interviews. For research purposes, an amount less than 40% can be accepted as useful.

Table 1. *Factor Structure of the Multidimensional Anxiety Scale for Children*

Items	Factor 1	Factor 2	Factor 3	Factor 4	h^2
18 (Chest pains)	.63				.43
12 (Dizziness)	.61				.39
8 (Shakiness)	.60				.46
24 (Racing heart)	.55				.51
6 (Breathing trouble)	.53				.42
35 (Shaky hands)	.49				.29
34 (Phobias)	.48				.40
27 (Restlessness)	.47				.38
20 (Feeling strange)	.46				.50
1 (Tenseness)	.45				.29
31 (Stomach sickness)	.45				.28
38 (Sweaty hands)	.42				.23
15 (Jumpiness)	.39				.37
3 (Fear of being laughed at)		.87			.63
10 (Fear of being made fun of)		.81			.67
16 (Fear of intellectual judgment)		.80			.65
22 (Fear of judgment in general)		.72			.63
29 (Fear of being embarrassed)		.71			.55
14 (Fear of speaking in class)		.61			.48
37 (Fear of asking others to play)		.56			.45
39 (Shyness)		.43			.32
33 (Performance fears)		.42			.32
21 (Pleasing others)		.32			.24
11 (Obeying family and teachers)			.64		.40
2 (Asking permission)			.55		.31
36 (Checking for safeness)			.45		.42
28 (Perfectionism)			.40		.31

Table 1 continued			
13 (Checking behaviors)	.34		.23
5 (Watching for danger)	.33		.32
25 (Avoidance behavior)	.32		.12
9 (Separation from parents)		.64	.48
19 (Separation from family)		.54	.38
32 (Sharing feelings of anxiety)		.52	.37
4 (Scared if parents leave)		.51	.46
26 (Sleeping by family)		.45	.35
17 (Fear of the dark)		.44	.32
7 (Fear of going to camp)		.43	.37
30 (Fear of riding in cars)		.40	.29
23 (Fear of scary movies)		.36	.22

Note. h^2 = communalities, cut-off for suppression = .30.

The matrix of intercorrelations among the MASC factors is reported in Table 2 (see next page). As the table shows, the correlations between the factors are low to moderate, indicating that each factor measures a unique aspect of the anxiety construct. Factors 1 (Physical Symptoms) and 2 (Social Anxiety) had the strongest correlation (-.48), whereas Factors 1 and 3 (Harm Avoidance) had the weakest correlation (.05). The correlations between Factors 1 and 4 (Separation/Panic), Factors 2 and 3, Factors 2 and 4, and Factors 3 and 4 were -.39, -.18, .34, and -.15, respectively.

Table 2. *Intercorrelations Among the Factors of the Multidimensional Anxiety Scale for Children*

Factor	1	2	3	4
1	1.00			
2	-0.48	1.00		
3	0.05	-0.18	1.00	
4	-0.39	0.34	-0.15	1.00

Next, Cronbach's alpha was computed for each factor to examine the internal consistency of the scale items. Generally, alpha estimates should be $\geq .70$ to be considered adequate. For the present sample, estimates ranged from .67 (Factor 3) to .89 (Factor 2). These alpha estimates are similar to those reported in both the manual and the literature. Harm Avoidance (Factor 3) has consistently had alpha estimates lower than the rest of the scales, as demonstrated above (Dierker et al., 2001; March, 1997a; March et al., 1997).

The results replicated the original factor structure of the MASC using the scores obtained from the psychiatric inpatient sample. Only three items were displaced: Item 34 ("Bad weather, the dark, heights, animals, or bugs scare me") loaded on Factor 1 (Physical Symptoms), but should have loaded on the Separation/Panic factor; Item 21 ("I try to do things other people will like") loaded on Factor 2 (Social Anxiety), but should have loaded on the Harm Avoidance factor; and Item 32 ("If I get upset or scared, I let someone know right away") loaded on Factor 4 (Separation/Panic), but should also have loaded on the Harm Avoidance factor. Because the obtained structure closely matched the original factor structure of the MASC, the original item-factor composition was retained for conducting further analyses in Phase 2 of this investigation.

Phase 2: Reliability and Validity of the MASC

Method

Participants and Procedures

Psychiatric Inpatient Sample. The participants were 92 psychiatric inpatient adolescents, ranging in age from 12 to 14 (mean age = 13.07 years, *SD* = .85), at the Mental Health Institute (MHI) in Independence, Iowa. Of the 92 participants, 48 were boys and 44 were girls. Boys (mean age = 13.02 years, *SD* = .84) and girls (mean age = 13.11 years, *SD* = .87) did not differ in terms of age, $t(90) = .52$, $p = .60$. The majority of the inpatient adolescents were Caucasian (91.3%), whereas 5.4% were African American, 1.1% were Hispanic/Latino, and 2.2% were American Indian/Alaska Native.

Reviews of the medical records identified participants with primary *DSM-IV-TR* diagnoses that included attention-deficit/hyperactivity disorder (17.4%), adjustment disorder (1.1%), bipolar disorder (1.1%), conduct disorder (28.3%), depression (13.0%), impulsivity disorder (1.1%), oppositional defiant disorder (33.7%), posttraumatic stress disorder (2.2%), and substance abuse disorder (2.2%).

Participants were administered the questionnaires (see "Measures" subsection) as part of their intake evaluation. As with the psychiatric inpatient sample for Phase 1 of this study, consent for participation was received upon admission to the children's unit at MHI. Assessment was conducted in a highly structured school setting, under the supervision of a trained undergraduate research assistant on an individual basis. If requested by the participant, each questionnaire was read aloud by the research assistant.

Middle-School Nonclinical Sample. The participants were 106 nonclinical middle-school students, ranging in age from 11 to 15 years, at the Malcolm Price Laboratory School (PLS) in

Cedar Falls, Iowa. Parent permission forms were sent home with all middle-school students who were enrolled at PLS at the time the study was conducted. Because parents were informed that their child's participation might result in a possible referral to the school psychologist, only 32 (approximately 30%) of the parental consent forms were returned. All 32 students were present on the days of data collection. Only participants for whom parent permission and assent were granted were given the questionnaire packet in a small group format under the supervision of trained undergraduate research assistants. Brief socio-demographic information such as age, gender, and ethnicity were included in the assessment packet. Data was collected on three consecutive days with one day allowed for each grade. Participants must have been present on the day of data collection for their grade in order to participate in the study.

The final nonclinical sample was composed of 32 participants (mean age = 12.69 years, SD = 1.00). There were an equal number of boys and girls included in the study (16 boys and 16 girls). Boys (mean age = 12.69 years, SD = .87) and girls (mean age = 12.69 years, SD = 1.14) did not differ in terms of age, $t(30) = .00$, $p = 1.00$. The majority of the adolescents were Caucasian (71.9%), whereas 12.5% were African American, 12.5% were Asian American, and 3.1% were Hispanic/Latino.

Measures

The Multidimensional Anxiety Scale for Children (MASC; March, 1997) and the Reynolds Adolescent Depression Scale – 2nd Edition (RADS-2; Reynolds, 2002) were administered to those participants who had the appropriate consent and assent.

Reynolds Adolescent Depression Scale – 2nd Edition. The RADS-2 is a 30-item self-report measure assessing a broad range of depressive symptoms and is composed of four scales: Dysphoric Mood (DM), Anhedonia/Negative Affect (AN), Negative Self-Evaluation (NS), and

Somatic Complaints (SC). A score for each scale, along with a total scale score, is calculated. The RADS-2 does not provide a diagnosis and it should not be used on its own for clinical assessments. The manual reports internal consistency reliability estimates ranging from .78 (SC) to .94 (total scale score). The manual also reports high content, criterion-related, convergent, and discriminant validity for the RADS-2. The RADS-2 is a relatively new instrument so few studies have been conducted using this scale.

Results and Discussion

Reliability Analysis

Reliability estimates were computed to measure the internal consistency of scale scores on the MASC and the RADS-2. Internal consistency reliability is the degree to which all the items on a scale measure the same construct. Specifically, the following estimates were computed: Cronbach's alpha (α), 95% Confidence Interval, and mean inter-item correlation. Cronbach's alpha is considered to be the mean of all possible split-half correlations. A value of .70 or above indicates that the scale scores have strong internal consistency. The mean inter-item correlation is the mean of the correlations among items in a scale. The higher the mean inter-item correlation for a scale, the more likely this scale is unidimensional. Values need to be .40 or above to be considered adequate. Because of the small sample sizes (n = 92 for the clinical sample, and n = 32 for the nonclinical sample), a mean inter-item correlation of .30 was used as the cut-off point. The above analyses were carried out separately for each scale and for each sample, and the results are presented in Tables 3 and 4.

As Table 3 shows, all scale scores had high alpha estimates (i.e., values $\geq$.70) for the combined clinical sample. For boys in the clinical sample, all RADS-2 scale scores had high alpha estimates. Only the Harm Avoidance scale scores (α = .67) and the Anxiety Disorders

Index scores (α = .69) on the MASC had estimates below the expected .70 value. For girls in the clinical sample, all scale scores had high alpha estimates except the Anhedonia/Negative Affect scale scores on the RADS-2 (α = .64). All the alpha estimates were within the expected 95% confidence intervals. For the MASC, the Physical Symptoms scale scores, the Social Anxiety scale scores, and the Separation/Panic scale scores had mean inter-item correlations above .30 across the combined clinical sample and both genders. Three of the four RADS-2 scale scores (Dysphoric Mood, Negative Self-Evaluation, and Somatic Complaints) had mean inter-item correlations equal to or greater than .30 for the combined clinical sample and for both boys and girls. The Anhedonia/Negative Affect scale scores had a mean inter-item correlation of .32 for boys. The RADS-2 total scale scores had mean inter-item correlations greater than .30 for both the combined clinical sample and for the girls.

Table 3. *Reliability Estimates for the MASC and the RADS-2 for the Clinical Sample*

	Combined (n = 92)			Boys (n = 48)			Girls (n = 44)		
	α	95% CI	r_a	α	95% CI	r_a	α	95% CI	r_a
MASC-PS	.89	.86 to .92	.40	.88	.82 to .92	.38	.91	.86 to .94	.46
MASC-HA	.70	.60 to .78	.21	.67	.51 to .80	.18	.73	.60 to .84	.23
MASC-SA	.87	.83 to .91	.43	.86	.79 to .91	.41	.89	.84 to .94	.47
MASC-SEP	.84	.79 to .89	.37	.85	.78 to .91	.39	.84	.76 to .90	.37
MASC-ADI	.72	.63 to .80	.20	.69	.55 to .81	.18	.75	.62 to .85	.23
MASC	.94	.91 to .95	.29	.93	.90 to .96	.25	.94	.91 to .96	.29
RADS-2-DM	.86	.82 to .90	.43	.85	.77 to .91	.42	.86	.79 to .92	.42
RADS-2-AN	.72	.62 to .80	.27	.77	.65 to .85	.32	.64	.45 to .78	.20
RADS-2-NS	.88	.84 to .92	.48	.86	.78 to .91	.43	.90	.85 to .94	.53
RADS-2-SC	.84	.79 to .89	.43	.83	.75 to .90	.41	.84	.76 to .90	.43
RADS-2	.93	.91 to .95	.31	.92	.89 to .95	.28	.94	.91 to .96	.34

Note. MASC-PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; MASC-HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; MASC-SA = Multidimensional Anxiety Scale for Children – Social Anxiety; MASC-SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC-ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; MASC = Multidimensional Anxiety Scale for Children; RADS-2-DM = Reynolds Adolescent Depression Scale – 2nd Edition – Dysphoric Mood; RADS-2-AN = Reynolds Adolescent Depression Scale – 2nd Edition – Anhedonia/Negative Affect; RADS-2-NS = Reynolds Adolescent Depression Scale – 2nd Edition – Negative Self-Evaluation; RADS-2-SC = Reynolds Adolescent Depression Scale – 2nd Edition – Somatic Complaints; RADS-2 = Reynolds Adolescent Depression Scale – 2nd Edition; α = Cronbach's alpha; r_a = Mean Inter-Item Correlation.

Table 4 shows the reliability estimates for the nonclinical sample. The majority of the scale scores had high alpha estimates for the combined nonclinical sample and for both boys and girls. However, both the Separation/Panic scale scores and the Anxiety Disorders Index scores on the MASC had alpha estimates ranging from .55 to .69. For girls, the Harm Avoidance scale scores on the MASC had an alpha estimate of .65. For boys, the Somatic Complaints scale scores

on the RADS-2 had an alpha estimate of .58. As with the clinical sample, all the alpha estimates for the nonclinical sample fell within their respective confidence intervals. Only one of the MASC scale scores (Social Anxiety) had mean inter-item correlations above .30 for both the combined nonclinical sample and genders. For the RADS-2, both the Dysphoric Mood scale scores and the Anhedonia/Negative Affect scale scores had mean inter-item correlations above .30 across the combined nonclinical sample and genders. The Negative Self-Evaluation scale scores had a mean inter-item correlation above .30 for both the combined nonclinical sample and for girls. The Somatic Complaints scale scores also had a mean inter-item correlation above .30 for girls.

Table 4. *Reliability Estimates for the MASC and the RADS-2 for the Nonclinical Sample*

	Combined (n = 32)			Boys (n = 16)			Girls (n = 16)		
	α	95% CI	r_a	α	95% CI	r_a	α	95% CI	r_a
MASC-PS	.76	.62 to .87	.21	.76	.54 to .90	.21	.78	.58 to .91	.23
MASC-HA	.71	.54 to .84	.21	.75	.51 to .90	.25	.65	.31 to .86	.17
MASC-SA	.83	.72 to .90	.34	.80	.62 to .92	.31	.80	.62 to .92	.31
MASC-SEP	.64	.41 to .81	.16	.57	.12 to .84	.12	.55	.13 to .82	.12
MASC-ADI	.65	.43 to .81	.16	.69	.39 to .88	.18	.57	.17 to .82	.12
MASC	.88	.80 to .93	.16	.88	.78 to .96	.16	.84	.71 to .93	.12
RADS-2-DM	.87	.80 to .93	.46	.86	.73 to .94	.43	.89	.79 to .96	.50
RADS-2-AN	.87	.80 to .93	.49	.89	.77 to .96	.54	.86	.72 to .94	.47
RADS-2-NS	.81	.70 to .90	.35	.75	.51 to .90	.27	.86	.73 to .95	.43
RADS-2-SC	.71	.52 to .85	.26	.58	.12 to .84	.16	.77	.54 to .91	.32
RADS-2	.93	.89 to .96	.14	.90	.80 to .96	.13	.95	.90 to .98	.15

Note. MASC-PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; MASC-HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; MASC-SA = Multidimensional Anxiety Scale for Children – Social Anxiety; MASC-SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC-ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; MASC = Multidimensional Anxiety Scale for Children; RADS-2-DM = Reynolds Adolescent Depression Scale – 2nd Edition – Dysphoric Mood; RADS-2-AN = Reynolds Adolescent Depression Scale – 2nd Edition – Anhedonia/Negative Affect; RADS-2-NS = Reynolds Adolescent Depression Scale – 2nd Edition – Negative Self-Evaluation; RADS-2-SC = Reynolds Adolescent Depression Scale – 2nd Edition – Somatic Complaints; RADS-2 = Reynolds Adolescent Depression Scale – 2nd Edition; α = Cronbach's alpha; r_a = Mean Inter-Item Correlation.

Although the alpha estimates for the clinical sample were strong for most of the scales, there are issues with respect to the mean inter-item correlations. About half of the scale scores had mean inter-item correlations below the cut-off point, even with the liberal value of .30. The MASC manual reports similar values for the mean inter-item correlations for each of the scales. These values suggest that the MASC scales are not measuring one dimension. The RADS-2

manual reports higher values for the mean inter-item correlations for each of the scales. We obtained smaller values but this could be due to the size of the study samples.

Research has consistently found alpha estimates for the Harm Avoidance scale and the Anxiety Disorders Index to be lower than the other scales on the MASC. The lower estimates for the Anxiety Disorders Index are expected, as the index measures a number of different symptoms from each of the different anxiety disorders of the DSM-IV-TR. However, the consistently lower alpha estimates for the Harm Avoidance scale scores remain to be an area of concern.

Descriptive Statistics and Gender Differences

Clinical Sample Analyses. Independent sample *t*-tests were conducted to examine gender differences on the MASC. Analyses were conducted at both the scale level and the item level. Means and standard deviations, along with results of the independent sample *t*-tests, are reported in Tables 5 and 6. The Bonferroni critical *p*-value was set at .02 (.05/5) for analyses at the scale level, and the critical value was set at .001 (.05/39) for all analyses at the item level.

Table 5 shows gender differences on the MASC scale scores for the clinical sample. Table 6 shows gender differences on the MASC item scores for the clinical sample. As the tables show, there were no statistically significant gender differences for the clinical sample at both the scale and item level analyses, based on Hotellings T^2 multivariate analyses of variance (MANOVAs) and follow-up independent samples analyses.

Table 5. *Gender Differences on the MASC Scales for the Clinical Sample*

	Boys (n = 48)		Girls (n = 44)				
	M	*SD*	*M*	*SD*	*t*	*p*	Cohen's *d*
MASC-PS	9.98	7.77	11.98	8.35	1.19	.24	.25
MASC-HA	13.77	4.64	14.34	4.75	.58	.56	.12
MASC-SA	9.81	6.89	10.41	6.96	.42	.68	.09
MASC-SEP	6.44	6.26	7.02	5.79	.46	.65	.10
MASC-ADI	11.06	5.22	12.05	5.04	.92	.36	.19
MASC	40.00	20.88	43.75	21.47	.85	.40	.18

Note. MASC-PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; MASC-HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; MASC-SA = Multidimensional Anxiety Scale for Children – Social Anxiety; MASC-SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC-ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; MASC = Multidimensional Anxiety Scale for Children.

Table 6. *Gender Differences on the MASC Items for the Clinical Sample*

	Boys (n = 48)		Girls (n = 44)				
Item	*M*	*SD*	*M*	*SD*	*t*	*p*	Cohen's *d*
1	1.31	1.06	1.61	.90	1.47	.15	.30
2	2.08	.79	1.95	.89	.73	.47	.16
3	1.29	1.15	1.30	1.07	.02	.99	.01
4	1.04	1.20	1.41	1.15	1.50	.14	.32
5	1.60	.98	1.73	.97	.60	.55	.13
6	.65	.93	.84	1.03	.95	.34	.19
7	.54	.90	.55	.76	.02	.98	.01
8	.94	1.04	.95	.99	.08	.94	.01
9	1.25	1.28	1.34	1.20	.35	.73	.07
10	1.06	1.14	.98	1.00	.38	.71	.07
11	1.90	.99	2.00	.78	.56	.58	.11
12	.60	.77	.80	.95	1.07	.29	.23
13	1.71	.94	1.41	.95	1.52	.13	.32
14	.77	.99	1.11	1.04	1.62	.11	.34
15	1.10	1.10	1.16	.96	.25	.80	.06
16	.81	1.10	.95	1.12	.61	.54	.13
17	.54	.87	.75	.99	1.07	.29	.23
18	.58	.87	.82	1.00	1.21	.23	.26
19	.75	1.04	.80	.98	.22	.83	.05
20	.69	1.04	1.09	1.05	1.85	.07	.38
21	1.52	1.13	1.70	1.00	.82	.41	.17
22	1.17	1.23	1.30	1.03	.54	.59	.11
23	.52	.99	.43	.90	.45	.65	.10
24	.71	1.03	.73	.95	.09	.93	.02
25	1.50	1.03	1.61	.92	.56	.58	.11
26	.65	1.08	.45	.79	.96	.34	.21

Table 6 continued

27	1.15	1.17	1.00	.94	.66	.51	.14
28	1.48	.97	1.50	.98	.10	.92	.02
29	1.35	1.18	1.43	1.00	.34	.74	.07
30	.35	.79	.39	.81	.19	.85	.05
31	.69	.93	.91	.96	1.13	.26	.23
32	.79	.99	1.09	.96	1.47	.15	.31
33	1.38	1.18	1.45	1.13	.33	.74	.06
34	.79	1.05	.91	1.05	.54	.59	.11
35	.73	.94	1.14	1.05	1.97	.06	.41
36	1.19	.96	1.34	.96	.76	.45	.16
37	.83	1.00	.80	1.00	.18	.86	.03
38	.83	1.02	.93	1.04	.46	.65	.10
39	1.15	1.11	1.09	1.10	.24	.81	.05

Note. MASC = Multidimensional Anxiety Scale for Children.

Nonclinical Sample Analyses. Similarly, independent sample *t*-tests were conducted to examine gender differences on the MASC at both the scale level and the item level for the nonclinical sample. Means and standard deviations, along with results of the independent sample *t*-tests, are reported in Tables 7 and 8. The Bonferroni critical *p*-value was set at .02 (.05/5) for analyses at the scale level, and the critical value was set at .001 (.05/39) for all analyses at the item level.

Table 7 shows the gender differences on the MASC scale scores for the nonclinical sample. Table 8 shows the gender differences on the MASC item scores for the nonclinical sample. As the tables show, there were no statistically significant gender differences for the nonclinical sample, except on Item 39, $t(30) = 4.02$, $p < .001$, $d = 1.42$. On this item, girls scored

significantly higher than boys. This difference is considered to be large and further examination of this difference is required.

Table 7. *Gender Differences on the MASC Scales for the Nonclinical Sample*

	Boys (n = 16)		Girls (n = 16)				
	M	*SD*	*M*	*SD*	*t*	*p*	Cohen's *d*
MASC-PS	10.19	4.76	10.69	5.63	.27	.79	.10
MASC-HA	16.06	4.61	17.56	3.52	1.03	.31	.37
MASC-SA	8.38	4.70	12.63	5.58	2.33	.03	.82
MASC-SEP	4.81	3.47	7.75	3.87	2.26	.03	.80
MASC-ADI	12.06	4.36	14.06	4.12	1.33	.19	.47
MASC	39.44	13.62	48.63	13.08	1.95	.06	.69

Note. MASC-PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; MASC-HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; MASC-SA = Multidimensional Anxiety Scale for Children – Social Anxiety; MASC-SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC-ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; MASC = Multidimensional Anxiety Scale for Children.

Table 8. *Gender Differences on the MASC Items for the Nonclinical Sample*

	Boys (n = 16)		Girls (n = 16)				
Item	*M*	*SD*	*M*	*SD*	*t*	*p*	Cohen's *d*
1	1.25	.93	1.50	.73	.85	.41	.30
2	2.38	.62	2.50	.73	.52	.61	.18
3	1.19	.75	1.56	.81	1.36	.19	.47
4	.38	.62	.88	.89	1.85	.07	.65
5	1.94	.93	1.88	.96	.19	.85	.06
6	.63	.72	.75	.86	.45	.66	.15
7	.56	.89	.56	.73	.00	1.00	.00
8	.63	.72	.69	.60	.27	.79	.09
9	.88	.89	1.19	.91	.98	.33	.34
10	.94	.77	1.19	1.05	.77	.45	.27
11	2.56	.89	2.63	.72	.22	.83	.09
12	.56	.63	.94	.93	1.34	.19	.48
13	2.13	.62	2.13	.62	.00	1.00	.00
14	.63	.81	.88	.96	.80	.43	.28
15	1.25	.86	1.00	.82	.85	.41	.30
16	.75	.77	1.00	.89	.85	.41	.30
17	.31	.70	1.19	1.17	2.57	.02	.91
18	.88	.81	.75	.86	.43	.67	.16
19	.75	.93	.94	.93	.57	.57	.20
20	.56	.63	.44	.73	.52	.61	.18
21	1.31	.95	1.88	.72	1.89	.07	.68
22	1.13	1.02	1.69	1.01	1.56	.13	.55
23	1.06	1.18	1.06	1.06	.00	1.00	.00
24	.75	.86	.94	1.00	.57	.57	.20
25	1.44	1.15	1.81	.83	1.05	.30	.37
26	.00	.00	.31	.48	2.53	.02	.89

Table 8 continued

27	1.00	.63	.56	.73	1.82	.08	.65
28	1.69	.95	1.94	.77	.82	.42	.29
29	1.44	1.03	1.69	.95	.72	.48	.25
30	.33	.62	.31	.79	.08	.94	.03
31	.75	.58	.75	.93	.00	1.00	.00
32	.88	.81	1.25	.68	1.42	.17	.50
33	1.38	1.02	1.69	1.14	.82	.42	.29
34	.56	.63	1.31	1.14	2.31	.03	.81
35	.44	.51	1.06	1.00	2.23	.03	.78
36	1.75	.93	1.56	.81	.61	.55	.22
37	.38	.62	1.19	1.11	2.56	.02	.90
38	1.50	1.03	1.31	1.08	.50	.62	.18
39	.56	.63	1.75	1.00	4.02	.001	1.42

Note. MASC = Multidimensional Anxiety Scale for Children.

Comparisons to the Normative Samples

Independent sample *t*-tests with unequal variances were conducted to examine differences on the MASC scale scores between the clinical sample and the normative sample (see MASC manual) for each gender. The analyses were repeated to examine the differences between the nonclinical sample and the normative sample for each gender. Unequal variance was used because the normative sample was more than double the size of both the clinical and the nonclinical samples. Results are reported in Tables 9 through 12.

Table 9 shows the results of the comparison of the clinical sample and the normative sample for boys. The clinical sample scored significantly higher than the normative sample on the Harm Avoidance scale, $t(57) = 2.76$, $p < .01$, $\eta^2 = .02$. The clinical sample also scored

significantly higher than the normative sample on the Separation/Panic scale, $t(50.18) = 2.72, p < .01, \eta^2 = .04$.

Table 9. *Comparison of the Clinical Sample and the Normative Sample Using the MASC Scale Scores for Boys*

	Clinical Sample ($n = 48$)		Normative Sample ($n = 448$)				
	M	*SD*	*M*	*SD*	*t*	*p*	η^2
MASC-PS	9.98	7.77	8.74	6.16	1.07	.29	.003
MASC-HA	13.77	4.64	15.71	4.52	2.76	.01	.02
MASC-SA	9.81	6.89	8.32	5.38	1.45	.15	.01
MASC-SEP	6.44	6.26	3.94	3.49	2.72	.01	.04
MASC-ADI	11.06	5.22	10.89	4.09	.22	.83	.000
MASC	40.00	20.88	36.70	14.35	1.07	.29	.004

Note. MASC-PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; MASC-HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; MASC-SA = Multidimensional Anxiety Scale for Children – Social Anxiety; MASC-SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC-ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; MASC = Multidimensional Anxiety Scale for Children.

Table 10 shows the results of the comparison of the clinical sample and the normative sample for girls. The clinical sample scored significantly higher than the normative sample on only the Harm Avoidance scale, $t(48.15) = 4.21, p < .001, \eta^2 = .04$.

Table 10. *Comparison of the Clinical Sample and the Normative Sample Using the MASC Scale Scores for Girls*

	Clinical Sample (n = 44)		Normative Sample (n = 535)				
	M	*SD*	*M*	*SD*	*t*	*p*	η^2
MASC-PS	11.98	8.35	11.36	7.00	.48	.63	.001
MASC-HA	14.34	4.75	17.44	4.00	4.21	.001	.04
MASC-SA	10.41	6.96	10.03	5.59	.35	.73	.000
MASC-SEP	7.02	5.79	5.40	3.64	1.83	.07	.01
MASC-ADI	12.05	5.04	12.65	4.19	.77	.45	.001
MASC	43.75	21.47	44.23	14.44	.15	.88	.000

Note. MASC-PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; MASC-HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; MASC-SA = Multidimensional Anxiety Scale for Children – Social Anxiety; MASC-SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC-ADI = Multidimensional Anxiety Scale

Table 11 shows the results of the comparison of the nonclinical sample and the normative sample for boys. There were no statistically significant differences between these two samples on any of the MASC subscale scores.

Table 11. *Comparison of the Nonclinical Sample and the Normative Sample Using the MASC Scale Scores for Boys*

	Nonclinical sample (n = 16)		Normative Sample (n = 448)				
	M	*SD*	*M*	*SD*	*t*	*p*	η^2
MASC-PS	10.19	4.76	8.74	6.16	1.45	.25	.002
MASC-HA	16.06	4.61	15.71	4.52	.30	.77	.000
MASC-SA	8.38	4.70	8.32	5.38	.05	.96	.000
MASC-SEP	4.81	3.47	3.94	3.49	.99	.34	.002
MASC-ADI	12.06	4.36	10.89	4.09	1.06	.31	.003
MASC	39.44	13.62	36.70	14.35	.97	.44	.001

Note. MASC-PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; MASC-HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; MASC-SA = Multidimensional Anxiety Scale for Children – Social Anxiety; MASC-SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC-ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; MASC = Multidimensional Anxiety Scale for Children.

Table 12 shows the results of the comparison of the nonclinical sample and the normative sample for girls. The nonclinical sample scored significantly higher than the normative sample on only the Separation/Panic scale, $t(15.80) = 2.40$, $p < .03$, $\eta^2 = .01$.

Table 12. *Comparison of the Nonclinical Sample and the Normative Sample Using the MASC Scale Scores for Girls*

	Nonclinical sample (n = 16)		Normative Sample (n = 535)				
	M	*SD*	*M*	*SD*	*t*	*p*	η^2
MASC-PS	10.69	5.63	11.36	7.00	.47	.65	.000
MASC-HA	17.56	3.52	17.44	4.00	.13	.90	.000
MASC-SA	12.63	5.58	10.03	5.59	1.84	.08	.006
MASC-SEP	7.75	3.87	5.40	3.64	2.40	.03	.01
MASC-ADI	14.06	4.12	12.65	4.19	1.35	.20	.003
MASC	48.63	13.08	44.23	14.44	1.32	.20	.003

Note. MASC-PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; MASC-HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; MASC-SA = Multidimensional Anxiety Scale for Children – Social Anxiety; MASC-SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC-ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; MASC = Multidimensional Anxiety Scale for Children.

Although there were statistically significant differences found between the different samples on some of the MASC subscale scores, none of the differences were clinically useful because the effect size estimates (η^2) were all small.

Contrasted Groups Validity

An independent sample *t*-test was conducted to examine the ability of scores on the MASC total scale to differentiate significantly the responses of the clinical and nonclinical youths. Specifically, contrasted groups validity is the degree to which the scale score is able to distinguish between the clinical and nonclinical samples.

A one-way multivariate analysis of variance (MANOVA) was also conducted to examine the ability of scores on all the four MASC subscales to differentiate significantly the responses of

the clinical and nonclinical samples. Follow-up independent sample *t*-tests were conducted to examine differences on each of the scales.

Results of the analyses are presented in Table 13. The independent sample *t*-test for the MASC total scale scores was not significant, $p = .58$. In the analyses involving scores on the subscales, the overall MANOVA was statistically significant, Hotelling's $T^2 = .15$, $p < .01$. The results of the independent sample *t*-tests showed that the nonclinical sample scored significantly higher than the clinical sample on the Harm Avoidance scale, $t(122) = 2.97$, $p < .01$, $d = .61$. Analysis showed no statistically significant differences between the groups on the remaining scale scores.

Table 13. *Contrasted Groups Validity of the MASC Scale Scores*

	Nonclinical ($n = 32$)		Clinical ($n = 92$)				
	M	*SD*	*M*	*SD*	*t*	*p*	Cohen's *d*
MASC-PS	10.44	5.14	10.93	8.07	.32	.75	.07
MASC-HA	16.81	4.11	14.04	4.68	2.97	.004	.61
MASC-SA	10.50	5.52	10.10	6.89	.30	.77	.06
MASC-SEP	6.28	3.91	6.72	6.02	.39	.70	.08
MASC-ADI	13.06	4.30	11.53	5.13	1.51	.13	.31
MASC	44.03	13.94	41.79	21.13	.56	.58	.12

Note. MASC-PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; MASC-HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; MASC-SA = Multidimensional Anxiety Scale for Children – Social Anxiety; MASC-SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC-ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; MASC = Multidimensional Anxiety Scale for Children.

Independent Correlational Analysis

An independent correlational analysis was conducted in order to explore the relationships between the MASC total scale scores and the RADS-2 scale scores for both the clinical and

middle school samples. First, a matrix of intercorrelations among the scale scores was constructed. This was followed by the independent correlational analysis using the five RADS-2 scale scores as validational measures. Estimates that range from .00 to .39 are considered to be low or slight; those that range from .40 to .60 are considered to be moderate, and those that are greater than or equal to .61 are considered high.

Results of the intercorrelations between the MASC scale scores and the RADS-2 scale scores for the clinical sample are reported in Table 14 (see Appendix 3). The intercorrelations among the MASC scale scores ranged from .40 to .91 for the boys (see bottom matrix), and the intercorrelations among the RADS-2 scale scores ranged from .15 to .91 for the boys as well. For the girls, the intercorrelations among the MASC scale scores ranged from .33 to .93 (see top matrix), and the intercorrelations among the RADS-2 scale scores ranged from .33 to .92. For boys, all of the MASC scales except Harm Avoidance correlated significantly with all the RADS-2 scales except Anhedonia/Negative Affect. The Physical Symptoms scale of the MASC correlated significantly with all of the RADS-2 scales for girls. Possible reasons for the greater number of correlations between the MASC and the RADS-2 for boys may be that, as mentioned earlier, boys feel more comfortable expressing their feelings in an institution. Here discriminant validity of the MASC was demonstrated to be greater for girls than for boys.

Results of the independent correlational analysis for the clinical sample are presented in Table 15. Examination of the *z*-test estimates showed that there were no statistically significant differences between boys and girls in terms of how the MASC total scale score correlated with the validational scale scores.

Table 15. *Independent Correlational Analysis for the Clinical Sample*

	Boys (n = 16)	Girls (n = 16)			
	MASC-Total	MASC-Total	z	p	95% CI
RADS-2 Total	.54	.25	.89	.37	-.40 to .81
DM	.53	.28	.77	.44	-.44 to .79
AN	.14	.11	.08	.94	-.63 to .66
NS	.48	.22	.76	.45	-.44 to .79
SC	.50	.21	.86	.39	-.41 to .80

Note. MASC = Multidimensional Anxiety Scale for Children; RADS-2 = Reynolds Adolescent Depression Scale – 2nd Edition; DM = Dysphoric Mood Scale; AN = Anhedonia/Negative Affect Scale; NS = Negative Self-Evaluation Scale; SC = Somatic Complaints Scale.

Results of the intercorrelations between the MASC scale scores and the RADS-2 scale scores for the nonclinical sample are reported in Table 16 (see Appendix 4). Results here are almost completely opposite of the results for the clinical sample. The intercorrelations among the MASC scale scores ranged from .25 to .85 for the boys (see bottom matrix), and the intercorrelations among the RADS-2 scale scores ranged from .02 to .87 for the boys as well. For the girls, the intercorrelations among the MASC scale scores ranged from .03 to .98 (see top matrix), and the intercorrelations among the RADS-2 scale scores ranged from .51 to .94. For boys, few of the intercorrelations among the MASC scale scores and the RADS-2 scale scores were statistically significant; whereas for girls the majority were statistically significant. The gender differences in the patterns of intercorrelations support the fact that girls feel more comfortable discussing emotions and feelings outside of the clinic setting. The discriminant validity of the MASC was demonstrated to be greater for boys than for girls.

Results of the independent correlational analysis for the nonclinical sample are presented in Table 17. Examination of the z-test estimates showed that the MASC total score correlated

significantly higher with the Anhedonia/Negative Affect scale score for the girls ($r = .58$, $p < .05$) than for the boys ($r = -.31$, $p = ns$), $z = 2.51$, $p < .01$. Examination of all other z-test estimates showed that there were no other statistically significant differences between boys and girls in terms of how the MASC total scale score correlated with the validational scale scores.

Table 17. *Independent Correlational Analysis for the Nonclinical Sample*

	Boys (n = 16)	Girls (n = 16)			
	MASC-Total	MASC-Total	z	p	95% CI
RADS-2 Total	.06	.63	1.74	.08	-.90 to .09
DM	.37	.60	.78	.44	-.79 to .43
AN	-.31	.58	2.51	.01	-.94 to -.21
NS	-.22	.54	2.11	.03	-.92 to -.06
SC	.30	.53	.72	.47	-.78 to .45

Note. MASC = Multidimensional Anxiety Scale for Children; RADS-2 = Reynolds Adolescent Depression Scale – 2nd Edition; DM = Dysphoric Mood Scale; AN = Anhedonia/Negative Affect Scale; NS = Negative Self-Evaluation Scale; SC = Somatic Complaints Scale.

Summary and Conclusions

The purposes of this study were as follows. The first purpose was to examine the factor structure, reliability, and validity estimates of the MASC. The second purpose was to evaluate gender differences on the MASC total and scale scores. The third purpose was to examine the extent to which scale scores on the MASC correlate with scale scores on a well-established measure of depression.

The findings of this study were similar to other recent studies of the MASC (Dierker et al., 2001; March, 1997a; March et al., 1997; March et al., 1999). Specifically, the factor structure was replicated in Phase 1. In Phase 2, the reliability estimates of the MASC were similar to the

reliability estimates reported in other studies. The Harm Avoidance scale and the Anxiety Disorders Index had alpha estimates below .70. As previously mentioned, the lower alpha estimates for the ADI are acceptable, but are not so for the Harm Avoidance scale. Future research needs to be conducted to further examine the psychometric properties of the Harm Avoidance scale.

Gender differences were similar to those found in the literature. As expected, we did not obtain significant gender differences on the MASC scale scores due to the fact that gender differences do not usually emerge until the age of 14 (e.g., Zohar et al., 1997). There are a number of explanations as to why there were no gender differences found in the clinical sample. First, the mean age of the clinical sample was 13.07 years. The literature shows that gender differences do not emerge until the age of 14, as mentioned above. Also, girls generally report higher levels of anxiety than boys, but these participants are institutionalized. Because of this, boys may feel more comfortable expressing their emotions because they are in a "safe environment."

The third, and perhaps most important, reason there were no gender differences on the MASC scale scores could be due to the fact that both genders have high levels of anxiety about future placements. Psychologists and counselors at MHI have found through their practice that anxiety levels rise when a child or adolescent is preparing to leave MHI for his/her next placement. Further research needs to be conducted to support this hypothesis, and therapy needs to focus on this issue.

When comparing our samples to the normative sample, we found that both the nonclinical sample and the clinical sample were similar to the normative sample in terms of responses to the MASC scales. A few differences were found between the clinical sample and

the normative sample. The normative sample may have higher than normal rates of anxiety, thus accounting for the lack of differences between the clinical sample and the normative sample. The manual states that the children and adolescents who participated in the norming of the MASC live in areas that have a higher than normal chance of living in poverty and a lower than normal chance of graduating from high school. More research needs to be conducted to assess whether or not the normative sample data is skewed.

In the comparison of the nonclinical sample to the normative sample, there was only one significant difference (the nonclinical girls scored higher than the normative girls on the Separation/Panic scale). The lack of differences between the nonclinical sample and the normative sample shows that the results of analyses in this study using the nonclinical sample may be generalizable to other nonclinical populations.

None of the MASC scales were able to differentiate meaningfully between the scores for the clinical sample and the scores for the nonclinical sample. High scores on the MASC scales indicate higher levels of anxiety, and therefore the clinical sample is expected to score higher than the nonclinical sample. However, the sample size for the nonclinical sample was small, and it is possible that the sample is not representative of the general population of 11 to 15 year olds.

The HA scale again has issues with differentiating between the clinical and the nonclinical sample. High scores on any of the MASC scales are indicative of higher levels of anxiety. As the above results show, the nonclinical sample scored significantly higher than the clinical sample on the HA scale. The effect size of this difference is considered to be medium. Combined with the low reliability estimates reported earlier, this data supports the issues of the HA scale brought up previously (i.e., that the HA scale combines items that measure protective factors and items that measure anxiety and is therefore not homogeneous). Further research

needs to be conducted to further examine the ability of the MASC to distinguish between nonclinical and clinical adolescents.

Both the contrasted groups validity and the discriminant validity were low; however, this could be due to the small sample sizes used in this study. Further research needs to be conducted with large sample sizes to further examine the ability of the MASC scale scores to distinguish between nonclinical and clinical adolescents and to discriminate from other scales.

There are some limitations to this study. First, only 2.2% of the clinical sample used in Phase 2 had a primary diagnosis of anxiety-related disorders. Also, all of the clinical sample participants were inpatients at a single institution. It is possible that there is something unique about this clinic setting that makes a patient more or less anxious.

Most importantly, the nonclinical sample size is very small. Only about 30% of the participants recruited brought back the parental consent forms. Since the consent forms were sent home with the students, a large portion of the consent forms were probably never given to the parents. In future investigations, researchers may benefit from mailing the consent forms directly to the parents instead of sending the forms home with the children.

As noted previously, a number of parents were concerned about the study's design. Originally this study was intended to help PLS identify students who scored above the cut-off scores on either the MASC or the RADS-2, and then these students were to receive follow-up assessments. Since parents were probably concerned that PLS did not have the adequate resources to conduct follow-up assessments, it is possible that more parental consent forms would have been returned if the section on follow-up assessments had not been included on the consent forms.

Because the list of PLS students who scored above the cut-off scores was going to be forwarded to the school counselor and a school psychologist, labeling issues were also involved. Students may not have wanted to participate in the study because they were afraid of being labeled as an anxious person or as a depressed person. Parents may not have wanted their children to participate in the study because they did not want their child to be labeled. Because parents were concerned with having a list of students who scored above the cut-off scores composed, this part of the study was dropped.

As previously mentioned, a major limitation of this study was the small nonclinical sample size. This small sample size restricted the statistical procedures that could be conducted. Confirmatory and exploratory factor analyses to further examine the factor structure of the MASC could not be conducted because there were too few participants. Also, regression analyses to examine the ability of the RADS-2 to predict scores on the MASC could not be conducted because, again, there were too few participants.

Overall the present data provided some support for the factor structure and psychometric properties of the MASC, but there are still many areas that need to be researched. Particularly, research needs to be conducted in the clinical setting to examine the hypothesis that anxiety levels rise as patients prepare to move to their next placement. This study does support this hypothesis, but further evidence is needed.

References

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd Rev. ed.). Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.

Austin, A. A. & Chorpita, B. F. (2004). Temperament, anxiety, and depression: Comparisons across five ethic groups of children. *Journal of Clinical Child and Adolescent Psychology, 33*, 216-226.

Beidel, D. C., Turner, S. M., & Morris, T. L. (1995). A new inventory to assess childhood social anxiety and phobia: The Social Phobia and Anxiety Inventory for Children. *Psychological Assessment, 7,* 73-79.

Beidel, D. C., Turner, S. M., & Morris, T. L. (1999). Psychopathology of childhood social phobia. *Journal of the American Academy of Child and Adolescent Psychiatry, 38,* 643-650.

Bernstein, G. A., Borchardt, C. M., & Perwein, A. R. (1996). Anxiety disorders in children and adolescents: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 1110-1119.

Casper, R. C., Belanoff, J., & Offer, D. (1996). Gender differences, but no racial group differences, in self-reported psychiatric symptoms in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 500-508.

Dierker, L. C., Albano, A. M., Clarke, G. N., Heimberg, R. G., Kendall, P. C., Merikangas, K. R., et al. (2001). Screening for anxiety and depression in early adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 929-936.

Essau, C. A., Conradt, J., & Petermann, F. (1999). Frequency and comorbidity of social phobia and social fears in adolescents. *Behaviour Research and Therapy, 37,* 831-843.

Essau, C. A., Conradt, J., & Petermann, F. (2000). Frequency, comorbidity, and psychosocial impairment of specific phobia in adolescents. *Journal of Clinical Child Psychology, 29,* 221-231.

Hoffman, S. G., Albano, A. M., Heimbers, R. G., Tracey, S., Chorpita, B. F., & Barlow, D. H. (1999). Subtypes of social phobia in adolescents. *Depression and Anxiety, 9,* 15-18.

Inderbitzen-Nolan, H. M., & Walters, K. S. (2000). Social Anxiety Scale for Adolescents: Normative data and further evidence of construct validity. *Journal of Clinical Child Psychology, 29,* 360-371.

Kearney, C. A., Albano, A. M., Eisen, A. R., Allan, E. D., & Barlow, D. H. (1997). The phenomenology of panic disorder in youngsters: An empirical study of a clinical sample. *Journal of Anxiety Disorders, 11,* 49-62.

Last, C. G., Hersen, M., Kazdin, A. E., Orvaschel, H., & Perrin, S. (1991). Anxiety disorders in children and their families. *Archives of General Psychiatry, 48,* 928-934.

Last, C. G., Perrin, S., Hersen, M., & Kazdin, A. E. (1992). DSM-III-R anxiety disorders in children: Sociodemographic and clinical characteristics. *Journal of the American Academy of Child and Adolescent Psychiatry, 31,*1070-1076.

March, J. (1997a). *Multidimensional Anxiety Scale for Children: Technical Manual.* North Tonawanda, NY: Multi-Health Systems.

March, J. S., Parker, J. D., Sullivan, K., Stallings, P., & Conners, C. K. (1997). The Multidimensional Anxiety Scale for Children (MASC): Factor structure, reliability, and

validity. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 554-565.

March, J. S., Sullivan, B. A., & Parker, J. (1999). Test-retest reliability of the Multidimensional Anxiety Scale for Children. *Journal of Anxiety Disorders, 13*, 349-358.

Mash, E. J., & Wolfe, D. A. (2002). *Abnormal Child Psychology* (2nd ed.). Belmont: Wadsworth.

Ollendick, T. H. (1983). Reliabilty and validity of the Revised Fear Survey Schedule for Children (FSSC-R). *Behavior Research and Therapy, 21,* 685-692.

Ollendick, T. H., & King, N. J. (1994). Diagnosis, assessment, and treatment of internalizing problems in children: The role of longitudinal data. *Journal of Consulting and Clinical Psychology, 62,* 918-927.

Ollendick, T. H., Mattis, S. G., & King, N. J. (1994). Panic in children and adolescents: A review. *Journal of Child Psychology and Psychiatry, 35,* 113-134.

Osman, A., Hoffman, J., Barrios, F. X., Kopper, B. A., Breitenstein, J. L., & Hahn, S. K. (2002). Factor structure, reliability, and validity of the Beck Anxiety Inventory in adolescent psychiatric inpatients. *Journal of Clinical Psychology, 58,* 443-456.

Perrin, S., & Last, C. G. (1992). Do childhood anxiety measures measure anxiety? *Journal of Abnormal Child Psychology, 20,* 567-578.

Pine, D. S., Cohen, P., Gurley, D., Brook, J., & Ma, Y. (1998). The risk for early-adulthood anxiety and depressive disorders in adolescents with anxiety and depressive disorders. *Archives of General Psychiatry, 55,* 56-64.

Reynolds, C. R., & Richmond, B. O. (1978). What I think and feel: A revised measure of children's manifest anxiety. *Journal of Abnormal Child Psychology, 6,* 271-280.

Reynolds, W. M. (2002). *Reynolds Adolescent Depression Scale: Professional Manual* (2nd ed.). Lutz, FL: Psychological Assessment Resources.

Sheeringa, M. S., & Zeanah, C. H. (1995). Symptom expression and trauma variables in children under 48 months of age. *Infant Mental Health Journal, 16,* 259-270.

Speilberger, C., Gorsuch, R., & Luchene, R. (1976). *Manual for the State-Trait Anxiety Inventory.* Palo Alto, CA: Consulting Psychologists Press.

Zohar, A. H., & Bruno, R. (1997). Normative and pathological obsessive-compulsive behavior and ideation in childhood: A question of timing. *Journal of Child Psychology and Psychiatry, 38,* 993-999.

Appendix 1

Parental Informed Consent

Dear Parent(s),

Your child has been invited to participate in a research project conducted through the University of Northern Iowa. The University requires that you give your signed agreement to allow your child to participate in this project. The following information is provided to help you make an informed decision about whether or not to participate.

This study has been approved by the Human Participants Institutional Review Board. The purpose of this study is to assess specific differences between clinical (patients at a state psychiatric hospital) and nonclinical (middle school students at Price Lab School) youths in their responses to well-established self-report measures of anxiety and depression severity. This study is also intended to provide base rate information of anxiety and depressive symptoms for Price Lab School.

The Multidimensional Anxiety Scale for Children (MASC; March, 1997) and the Reynolds Adolescent Depression Scale – 2nd Edition (RADS-2; Reynolds, 2002) will be administered to those participants who have parent consent, and also give their assent. Brief socio-demographic information such as age, gender, and ethnicity will be included in the assessment packet. Participants will be allowed 45 minutes to complete the packet. Risks for this study are minimal.

Information obtained during this study which could identify your child will be kept confidential. The summarized findings, with no identifying information, may be published in an academic journal or presented at a scholarly conference. A list of all PLS students who score above the established cutoff score on either of the scales (i.e., the MASC and RADS-2) will be forwarded to the counselor of PLS and a school psychologist. Parents of these students may or may not be notified by either the counselor or the school psychologist.

Your child's participation is completely voluntary. He or she is free to withdraw from participation at any time or to choose not to participate at all, and by doing so, your child will not be penalized or lose benefits to which he/she is otherwise entitled.

If you currently have questions about the study or if you desire information in the future regarding your child's participation or the study in general, you can contact me at 515-299-0900 or (if appropriate) my faculty advisor, Dr. Augustine Osman, at the Department of Psychology, University of Northern Iowa, 319-273-7651. You can also contact the office of the Human Participants Coordinator, University of Northern Iowa, at 319-273-2748, for answers to questions about rights of research participants and the participant review process.

If you agree to have your child participate in this study, please sign a copy of this letter and have your child return it to his or her teacher by Friday, March 11. Please keep this copy for your records.

Thank you,

_____

Nicole Carlson, Primary investigator

_____

Augustine Osman, Ph.D., ABAP, Faculty Sponsor

I am fully aware of the nature and extent of my child's participation in this project as stated above and the possible risks arising from it. I hereby agree to allow my son/daughter to participate in this project. I have received a copy of this form.

_____ _____

(Signature of parent/legal guardian) (Date)

_____

(Printed name of parent/legal guardian)

_____

(Printed name of child participant)

_____

Nicole Carlson, Primary investigator

_____

Augustine Osman, Ph.D., ABAP, Faculty Sponsor

Appendix 2

Informed Assent

Project Title: A Comparison of Anxiety and Depression between Clinical and Nonclinical Adolescents
Name of Principal Investigator(s): Nicole Carlson and Dr. Augustine Osman

I, _____, have been told that one of my parents/guardians has given his/her permission for me to participate in a project about my feelings. I will be asked to answer some questions that ask me how I feel, and there are no right or wrong answers. I understand that it will take about 20 minutes for me to complete these questions.

I understand that my participation is voluntary. I have been told that I can stop participating in this project at any time. If I choose to stop or decide that I don't want to participate in this project at all, nothing bad will happen to me. My grade will not be affected in any way.

_____ _____
Name Date

_____
Nicole Carlson, Primary investigator

_____
Augustine Osman, Ph.D., ABAP, Faculty Sponsor

Table 14. *Intercorrelations among the MASC scale scores and the RADS-2 scale scores for the Clinical Sample*

	PS	HA	SA	SEP	MASC	ADI	DM	AN	NS	SC	RADS2
PS	1.00	.33*	.76***	.65***	.88***	.77***	.37*	.19	.38*	.32*	.39**
HA	.40***	1.00	.51***	.59***	.67***	.67**	.02	-.14	-.14	-.07	-.09
SA	.58***	.57***	1.00	.54***	.88***	.83***	.23	.18	.21	.20	.24
SEP	.67***	.48***	.54***	1.00	.83***	.78***	.23	.04	.13	.12	.16
MASC	.85***	.70***	.83***	.84***	1.00	.93***	.28	.11	.22	.21	.25
ADI	.74***	.67***	.86***	.67***	.91***	1.00	.24	.09	.20	.21	.23
DM	.61***	.20	.42**	.40**	.53***	.56***	1.00	.36*	.78***	.82***	.92***
AN	.16	-.07	.16	.14	.14	.01	.15	1.00	.47***	.33*	.58***
NS	.61***	.17	.34*	.35*	.48***	.47***	.82***	.25	1.00	.73***	.92***
SC	.59***	.26	.39**	.32*	.50***	.55***	.80***	.12	.73***	1.00	.88***
RADS2	.64***	.19	.42**	.39**	.54***	.53***	.91***	.42**	.91***	.87***	1.00

Note. The top matrix is for girls; the bottom matrix is for boys. PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; SA = Multidimensional Anxiety Scale for Children – Social Anxiety; SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC = Multidimensional Anxiety Scale for Children; ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; DM = Reynolds Adolescent Depression Scale – 2nd Edition – Dysphoric Mood; AN = Reynolds Adolescent Depression Scale – 2nd Edition – Anhedonia/Negative Affect; NS = Reynolds Adolescent Depression Scale – 2nd Edition – Negative Self-Evaluation; SC = Reynolds Adolescent Depression Scale – 2nd Edition – Somatic Complaints; RADS-2 = Reynolds Adolescent Depression Scale – 2nd Edition; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 16. *Intercorrelations among the MASC scale scores and the RADS-2 scales scores for the Nonclinical Sample*

	PS	HA	SA	SEP	MASC	ADI	DM	AN	NS	SC	RADS2
PS	1.00	.03	.60*	.22	.76***	.74***	.72**	.61*	.71**	.70**	.78***
HA	.54*	1.00	.31	.26	.49	.48	-.13	-.04	-.24	-.15	-.16
SA	.55*	.25	1.00	.30	.86***	.89***	.62*	.66**	.55*	.44	.64**
SEP	.49	.61*	.40	1.00	.59*	.53*	.19	.16	.21	.29	.24
MASC	.85***	.77***	.72**	.77***	1.00	.98***	.60*	.58*	.54*	.53*	.63**
ADI	.70**	.65*	.72**	.55*	.85***	1.00	.59*	.60*	.53*	.49	.62**
DM	.58*	.07	.40	.03	.37	.29	1.00	.70**	.75***	.73***	.91***
AN	-.10	-.53*	-.18	-.13	-.31	-.56*	.09	1.00	.83***	.51*	.84***
NS	.08	-.58*	.02	-.22	-.22	-.30	.60*	.42	1.00	.76***	.94***
SC	.60*	.04	.31	-.12	.30	.17	.65**	.02	.55*	1.00	.85***
RADS2	.40	-.34	.19	-.14	.06	-.13	.81***	.53*	.87***	.73***	1.00

Note. The top matrix is for girls; the bottom matrix is for boys. PS = Multidimensional Anxiety Scale for Children – Physical Symptoms; HA = Multidimensional Anxiety Scale for Children – Harm Avoidance; SA = Multidimensional Anxiety Scale for Children – Social Anxiety; SEP = Multidimensional Anxiety Scale for Children – Separation/Panic; MASC = Multidimensional Anxiety Scale for Children; ADI = Multidimensional Anxiety Scale for Children – Anxiety Disorders Index; DM = Reynolds Adolescent Depression Scale – 2nd Edition – Dysphoric Mood; AN = Reynolds Adolescent Depression Scale – 2nd Edition – Anhedonia/Negative Affect; NS = Reynolds Adolescent Depression Scale – 2nd Edition – Negative Self-Evaluation; SC = Reynolds Adolescent Depression Scale – 2nd Edition – Somatic Complaints; RADS-2 = Reynolds Adolescent Depression Scale – 2nd Edition; * $p < .05$; ** $p < .01$; *** $p < .001$.