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An Examination of the Structure of Affect in a Sample of Inpatient Adolescents

Marietta A. Veeder
Utah State University

AN EXAMINATION OF THE STRUCTURE OF AFFECT IN A SAMPLE OF INPATIENT ADOLESCENTS

by

Marietta A. Veeder

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ABSTRACT

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Marietta A. Veeder, Doctor of Philosophy

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Major Professor: Susan L. Crowley, Ph.D.
Department: Psychology

Multiple studies investigating the validity of the tripartite model of affect in youth have been supportive of the model; however, few studies have examined the model in narrow age bands or large clinical samples. The current study examined the structure of affect in a sample of psychiatrically hospitalized adolescents. Structural equation modeling was used to examine two-factor (negative affectivity [NA] and positive affectivity [PA]) and three-factor models (NA, PA, and physiological hyperarousal [PH]) with item level data from the Reynolds Adolescent Depression Scale (RADS) and Revised Children's Manifest Anxiety Scale (RCMAS), and from the Millon Adolescent Clinical Inventory (MACI), RADS, and RCMAS. Analyses were completed for the overall sample and for depressive, anxiety, comorbid depression, and anxiety, and other diagnostic groups.

With data from the RADS and RCMAS, both the two- and three-factor models provided an equally good fit to the data for the overall sample. However, when tested for invariance across diagnostic groups, the two-factor model was invariant across groups, while the three-factor model yielded inadmissible solutions for the comorbid group,

suggesting the two-factor solution provided the best fit to the data. For the data from the MACI, RADS, and RCMAS, one-, two-, and three-factor models were tested, but it was not possible to identify a model of acceptable fit.

The *t* tests were used to examine the patterns of construct scores across diagnostic groups to determine if they were consistent with the tripartite model. Using data from the RCMAS and the RADS, the depressive and anxious diagnostic groups demonstrated similarly high levels of NA, while the anxious group demonstrated significantly higher levels of PA than the depressive group. Similar analyses could not be completed for the data from the MACI, RADS, and RCMAS because of the small sample size for the anxious diagnostic group.

While the results of SEM and *t*-test analyses demonstrate support for the tripartite model and the associated constructs of NA and PA, support was not demonstrated for PH. Results suggest that the tripartite model may be dependent on the instruments used to assess it. Limitations of this study and implications and directions for future research are discussed.

(181 pages)

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Marietta A. Veeder

CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Depressive disorders occur in approximately 1.8% to 2.5% of school-aged children (6-12 years old) in the United States, with the incidence increasing to a range of 4.7% to 8.3% of all adolescents (13-18 years; National Institute of Mental Health [NIMH], 2000). Young people who experience a depressive disorder are at increased risk for negative outcomes including social withdrawal, family and peer problems, academic problems, increased probability of recurrent depressive episodes, development of comorbid mental health disorders (e.g., anxiety disorders, bipolar disorder, disruptive behavior disorders, and substance abuse problems), and suicidal ideation and action (Aalto-Setala, Marttunen, Tuulio-Henriksson, Poikolainen, & Lonnqvist, 2002; Kaslow, Brown, & Mee, 1994; Kazdin & Marciano, 1998; Lewinsohn et al., 1994). Psychosocial impairment appears to rise with increasing severity of depression; however, even subclinical levels of depressive symptomatology are associated with impairment, particularly social. Additionally, the problems in functioning appear to persist into adulthood, as does the likelihood of recurrence of a depressive disorder (Lewinsohn, Rohde, Seeley, & Fischer, 1993).

Anxiety disorders are even more common that depressive disorders in children and adolescents. Although the prevalence rates for the various anxiety disorders vary, the NIMH (2000) reported that anxiety disorders are the most common of childhood psychiatric conditions and an estimated 13% of young people are affected during any given 6-month period. Anxiety disorders in children and adolescents can be associated with significant functional impairment. Children and adolescents diagnosed as having an anxiety disorder are at risk for increased rates of behavioral and mood symptoms, somatic complaints, academic difficulties, and poor self-esteem. Studies have

demonstrated that young people diagnosed with specific anxiety disorders present greater risks for suicide, substance use, and depression compared to their nonanxious peers (Anderson & McGee, 1994; Kashani & Orvaschel, 1990). Much like their depressed peers, adolescents with anxiety disorders have significantly greater difficulties with peers and family members than do typical peers (Kashani & Ovraschel). Like depression, anxiety disorders in children and adolescents frequently go untreated and, in the absence of effective treatment, tend to persist. Adolescents with anxiety disorders, particularly untreated, often grow up to be adults with anxiety, depression, or other affective disorders (Lott, 2001; Pollack, Otto, Rosenbaum, & Sachs, 1992).

Additionally, it is not unusual for depressive and anxiety disorders to occur comorbidly or in temporal succession. Epidemiological studies employing nonclinical samples of youth indicate that for children or adolescents with a depressive disorder, comorbid anxiety disorders occur in 30% to 75% of the samples (Angold & Costello, 1993). Another study found equally high rates of comorbid depressive disorders in adolescents diagnosed with anxiety disorders (Lewinsohn, Rohde, & Seely, 1998). Further complicating the diagnosis and understanding of depression and anxiety in children and adolescents are the overlapping affective, cognitive, and behavioral symptoms of the disorders that sometimes make it difficult to differentiate the two groups of disorders (Brady & Kendall, 1992).

Early self-report measures of anxiety and depression were plagued with psychometric problems. Studies indicated that the correlations between various self-report measures of childhood or adolescent depression and anxiety were moderate to high (Norvell, Brophy, & Finch, 1985; Watson & Kendall, 1989). These findings raised questions about whether the instruments were actually measuring separate and distinct

constructs or disorders or whether depression and anxiety, when measured by self-report in youth, were a single category.

Clark and Watson (1991) provided one possible explanation for the high convergent and poor discriminant validity of self-report instruments, as well as a way to understand the common features of depressive and anxiety disorders with the tripartite model. They hypothesized the existence of three distinct constructs, negative affectivity (NA), positive affectivity (PA), and physiological hyperarousal (PH). Within the tripartite model, negative affectivity refers to general distress or the tendency to feel fatigued, worried, and unhappy. Positive affectivity refers to having the energy to engage in, and experience pleasure in, daily activities. Physiological hyperarousal includes symptoms such as feelings of tension, nervousness, shakiness, and panic. Clark and Watson hypothesized that anxiety and depression are difficult to differentiate because both present with significant amounts of general distress or NA. Further, depression and anxiety can be differentiated from each other using PA and PH. Clark and Watson asserted that depression can be identified by low PA in the presence of high NA. They also hypothesized that high PH is unique to anxiety and is reported along with high NA by people with significant anxiety, but not by those who are depressed.

A significant body of research supports the utility of the tripartite model in distinguishing between depression and anxiety on the basis of the three constructs of NA, PA, and PH in adults (Clark, Steer, & Beck, 1994; Joiner, 1996; Jolly & Dykman, 1994; Steer, Clark, Beck, & Ranieri, 1994; Watson, Clark, & Carey, 1988; Watson, Weber, et al., 1995). Beginning about a decade ago, researchers began investigating the utility of the tripartite model for describing depression and anxiety in children and adolescents.

A number of studies examining the structure of affect in youth identified a three-factor model of NA, PA, and PH, as providing the best fit for their child and adolescent samples (Chorpita, 2002; Chorpita, Albano, & Barlow, 1998; Jacques & Mash, 2004; Lambert, McCreary, Joiner, Schmidt, & Ialongo, 2004; Turner & Barrett, 2003). However, a nearly equal number of studies identified a two-factor model as best fitting their data (Austin & Chorpita, 2004; Bushman, 2004; Joiner, Catanzaro, & Laurent, 1996; Lonigan, Hooe, David, & Kistner, 1999; Lonigan, Phillips, & Hooe, 2003; Ollendick, Seligman, Goza, Byrd, & Singh, 2003). Thus, there still remains some controversy whether PH can distinguish depression and anxiety, as compared to NA and PA that are well supported.

Several authors (Chorpita, Daleiden, Moffitt, Yin, & Umemeto, 2000; Laurent, Catanzaro, & Joiner, 2004) suggested that the lack of support for PH may be an artifact of the existing measures of depression and anxiety that do not assess symptoms of physiological hyperarousal (e.g., Children's Depression Inventory [CDI]; Kovacs, 1985; Revised Children's Manifest Anxiety Scale [RCMAS]; Reynolds & Richmond, 1985). More recent measures such as the Positive and Negative Affect Scale for Children (PANAS-C; Laurent, Potter, & Catanzaro, 1994) were specifically designed to assess negative and positive affect, but also do not include PH. Therefore, questions remain about how to best measure PH, and a variety of potential useful measures have not been investigated.

Further, the majority of studies investigating the tripartite model in children and adolescents have used nonclinical samples. Although those studies provide important information, it is unclear whether children and adolescents with diagnoses of anxiety or depressive disorders will evidence the same tripartite structure. As with the literature overall, the studies using clinical samples have found mixed support for a two- versus

three-factor model. Further, most of these studies have had relatively small samples of diagnostically heterogeneous participants.

Finally, many studies have used a wide age range of children and adolescents, collapsed into a single sample. More recently, a number of studies have demonstrated developmental differences in the structure of affect, specifically, the differentiation of the tripartite constructs in youth of different ages (e.g., Bushman, 2004; Jacques & Mash, 2004; Ollendick et al., 2003). These findings suggest that investigations of homogeneous age groups may yield more accurate findings related to the structure of affect.

Based upon the research conducted to date, a number of questions remain regarding the utility of the tripartite model in adolescents. These questions include whether a two- or three-factor model best describes the structure of affect in adolescents, whether the model is invariant across different diagnostic groups, and whether other existing measures of adolescent symptomatology may have utility in measuring NA, PA, and PH.

Thus, the present study investigates some of these questions through the investigation of a large sample of psychiatrically hospitalized adolescents. To address the assessment of the tripartite constructs, several commonly used measures, as well as a previously uninvestigated measure of adolescent symptomatology will be used (Reynolds Adolescent Depression Scale; Revised Children's Manifest Anxiety Scale, and Millon Adolescent Clinical Inventory). The large clinical sample affords the opportunity to examine whether the identified model of best fit is invariant across diagnostic groups (e.g., depressive diagnosis, anxiety diagnosis).

CHAPTER II

REVIEW OF THE LITERATURE

The present section provides an overview of the literature most salient to the current study. An overview of childhood depressive and anxiety disorders, including descriptions of the disorders, prevalence rates, and issues related to assessment is discussed. A description of the tripartite model and a brief summary of the research addressing the utility of the model with adult populations is reviewed. Studies examining the structure of depression and anxiety in children and adolescents are presented. For the purposes of this review of the literature, a search of the Psychology and Behavioral Sciences Collection, and PsycARTICLES, and PsycINFO databases was undertaken using the keywords: "structure of affect," "tripartite model," "children," "adolescents," and "youth" with the goal of identifying all studies examining the structure of affect in children and adolescents. In addition, the reference lists from each of the articles were reviewed to identify additional studies. No attempt was made to identify unpublished studies.

The literature review is organized around several general themes relevant to the present study. This includes whether studies explored a two-factor structure of affect or a three-factor structure of affect; if the study investigated developmental or age-related differences in the structure of affect; and studies that investigated the structure of affect in clinical samples. Thus, the sections of the literature review are nonunique and the same study may be discussed in two parts of this review of studies if the findings were relevant to those factors (e.g., developmental differences in a clinical sample would be discussed in both sections). Finally, strengths and limitations of these studies are identified in a final section to demonstrate how the current study will add to the existing body of research.

Anxiety and Depression: Descriptions, Prevalence, Associated Outcomes, Comorbidity, and Assessment Issues

This first section provides descriptions of depressive and anxiety disorders in children and adolescents and basic information related to prevalence rates, sequelea associated with the diagnoses, and comorbidity. Our understanding of depression and anxiety in youth has increased markedly in the past two and a half decades and this section provides a brief description of the current views of the disorders as well as the research conducted studying the disorders in the late 1970s and early 1980s. This section also describes the problems related to using self-report instruments to assess the presence of the disorders due to poor discriminant validity.

Description of Depressive Disorders in Children and Adolescents

The term depression is used interchangeably to refer to a symptom (mood), a syndrome, or a disorder (Compas, Ey, & Grant, 1993; Hammen & Rudolph, 1996; Kazdin & Marciano, 1998). Depression, as a symptom, refers to unhappiness, dysphoria, or sad affect or mood, a state experienced by most people at some point in everyday life (Kazdin & Marciano). Depression, as a syndrome, refers to a constellation of symptoms that co-occur in a recognizable and statistically coherent pattern, and are not simply associated by chance (Hammen & Rudolph). In the current nosological system, the *Diagnostic and Statistical Manual of Mental Disorders (4th ed., text revision*; *DSM-IV-TR;* American Psychiatric Association, 2000), individuals with a formal diagnosis of a depressive disorder, such as major depressive disorder, dysthymic disorder, or major depressive episode must meet minimum diagnostic criteria in terms of number

and duration of symptoms of the disorder. Some of the DSM-IV diagnostic criteria associated with a major depressive episode in children or adolescents include either a depressed or irritable mood most of the day, nearly every day; diminished interest or pleasure in all or almost all daily activities for the majority of the day, most days; significant weight loss or gain; insomnia or hypersomnia; changes in psychomotor activity; fatigue or reduced levels of energy nearly every day; guilt feelings that are excessive or inappropriate; feelings of worthlessness; diminished ability to think or concentrate; recurrent thoughts of death, and recurrent suicidal thoughts without a specific plan, a specific plan for committing suicide, or an actual suicide attempt (*DSM-IV-TR*). For dysthymic disorder, the symptoms are similar but need to be present to a less significant degree, for a period of at least 1 year (for children and adolescents).

Incidence rates for depression in youth are reported to range from 1.8% to 2.5% for children ages 6-12 and from 4.7% to 8.3% for teenagers ages 13-18 (NIMH, 2000). Prevalence rates differ based on the specific disorder. Hammen and Rudolph (1996) summarized the findings from a group of epidemiological studies of child and adolescent depression and reported that collapsed across child and adolescent samples, the most commonly reported 6- to 12-month prevalence rates for major depression range from 6% to 8%. Dysthymic disorder has been less studied than Major Depressive Disorder and prevalence estimates range from 0.07% to 9% (Kazdin & Marciano, 1998).

Depression, at both a syndromal and disorder level, is associated with serious psychosocial impairment. Kaslow and colleagues (1994) reported that depressed children demonstrated deficits and distortions in cognitive processing including negative beliefs, attributions of failure, and an external locus of control. Depressed youth are more likely to manifest problems in academic functioning than their nondepressed peers. Poor academic achievement (Cole, 1990) and school behavior problems are common

(Puig-Antich et al., 1985). It has also been noted that adolescents with higher levels of depression have poorer school attendance, greater dissatisfaction with school, and are less likely to graduate from high school than nondepressed peers (Cole, 1990; Kandel & Davies, 1986). Adolescent depression is related to poorer social adjustment including deficits in social skills, interpersonal problem-solving, and poor peer relations (Kaslow et al.). Depressed children and adolescents are also reported to have higher levels of problems with interpersonal relationships within the family and are more likely to be socially isolated (Kazdin, Esveldt-Dawson, Sherick, & Colbus, 1985). Lewinsohn and his colleagues (1994) reported that adolescents who are depressed are at increased risk for drug use, delinquency, arrest, criminal conviction, and future unemployment. Adolescents with depression demonstrate higher occurrences of hospitalization, increased suicidality, and greater dissatisfaction with life (Aalto-Setala et al., 2002).

Children and adolescents with a depressive disorder diagnosis often meet the diagnostic criteria for at least one other diagnosis. Kazdin and Marciano reported comorbidity rates in the range of 40% to 50% (1998). Anxiety disorders are common comorbid diagnoses, as are disruptive behavior disorders (Brady & Kendall, 1992; Kazdin & Marciano). Substance abuse diagnoses are also frequently observed. Even when depressed youth fail to meet the full diagnostic criteria for a second disorder, they are likely to demonstrate a broad range of symptoms that may impact the overall functioning, the efficacy of treatment, and their long-term prognosis. Long-term follow-up studies of adolescents who were diagnosed with depression have emphasized the increased risk of adult depression (Pine, Cohen, Gurley, Brook, & Ma, 1998).

Description of Anxiety Disorders in Children and Adolescents

Although many children experience transient fears and anxieties as isolated symptoms that are developmental in nature, anxiety disorders are associated with severe impairment in daily functioning. The *DSM-IV-TR* (2000) provides for the diagnosis of children and adolescents with nine distinct anxiety disorders, each with its own set of diagnostic criteria. The anxiety disorders include: acute stress disorder, agoraphobia, generalized anxiety disorder (GAD), obsessive-compulsive disorder (OCD), panic disorder, post-traumatic stress disorder (PTSD), separation anxiety disorder (SAD), social phobia, and specific phobia. Each of the anxiety disorders shares anxiety as the central feature and that for each disorder, anxiety is expressed through specific and identifiable cognitive, physiological, and behavioral reactions. What distinguishes one anxiety disorder from the next is the focus of the child's anxiety and the associated cognitive, physiological, and behavioral reactions.

According to the NIMH (2000), anxiety disorders are the most common of childhood psychiatric conditions, affecting an estimated 13% of young people during any given 6-month period. In two cross-sectional epidemiological studies 21% of children and adolescents, ages 8, 12, or 17 years old, reported symptoms that were consistent with anxiety disorder diagnoses (Kashini & Orvaschel, 1990; Kashini, Orvaschel, Rosenberg, & Reid, 1989). Prevalence rates vary among the various anxiety disorders. In population studies, prevalence rates for SAD range from 2.0% to 12.9% (Anderson, Williams, McGee, & Silva, 1987; Kashini & Orvaschel, 1990; Kashini et al., 1989; McGee et al., 1990). Obsessive-compulsive disorder prevalence rates range from 1.9% to 4.0% (Flament et al., 1988; Valleni-Basile et al., 1994; Zohar et al., 1992). The lifetime prevalence rate for Panic Disorder was reported to be approximately 1% in several

studies (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993; Whitaker et al., 1990). Prevalence rates for GAD, previously identified as over-anxious disorder of childhood have been reported ranging from 2.0% to 12.4%; however, the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; [DSM-IV], American Psychiatric Association, 1994) warns that GAD may be overdiagnosed in children.

Anxiety disorders are a disabling form of psychopathology that can be associated with significant functional impairment in children and adolescents. Young people with anxiety disorders have increased rates of behavioral and mood symptoms, somatic complaints, academic difficulties, and poor self-esteem. They also present greater risks for suicide, substance use, and depression compared to the general population (Anderson & McGee, 1994; Kashani & Orvashel, 1990). Much like their depressed peers, adolescents with anxiety disorders have significantly greater difficulties with both peers and family members than do typical peers (Kashani & Ovrashel). Like depression, anxiety disorders in children and adolescents often go untreated and in the absence of effective treatment tend to persist. Youth with anxiety disorders who do not receive treatment may have a chronic course and low rate of remission of symptoms (Bernstein & Borchardt, 1991). Children with anxiety disorders, particularly untreated, often grow up to be adults with anxiety, depression, or other affective disorders (Lott, 2001; Pollack et al., 1992). However, there is evidence that suggests that early treatment of anxiety disorders in youth can ameliorate the symptoms of the anxiety disorder in addition to reducing the tendency toward the development of avoidant coping strategies and comorbid mood disorders (Pollack et al.).

Comorbidity of Depression and Anxiety in Children and Adolescents

It is not uncommon for depressive and anxiety disorders to occur in unison or in temporal succession. In eight epidemiological studies utilizing community samples, children and adolescents with major depressive disorders or dysthymia, experienced comorbid anxiety disorders at rates that ranged from 30% to 75% (Angold & Costello, 1993). Similar rates of comorbidity were reported in eight clinical studies that examined the comorbidity of depression and anxiety in children and/or adolescents. Lewinsohn and colleagues' (1998) results indicated that 20% of the sample diagnosed with major depressive disorder also met the diagnostic criteria for an anxiety disorder, while 54% of the high school students diagnosed with an anxiety disorder also met the criteria for a diagnosis of major depressive disorder. Moreover, even when the disorders are not codiagnosed, depressive and anxious disorders present with many overlapping features including affective, cognitive, behavioral, and physiological symptoms, sometimes making it difficult to differentiate one disorder from another (Brady & Kendall, 1992). The overlapping features of depression and anxiety complicate our ability to accurately diagnosis the disorders, a problem discussed in more detail in the next section.

Assessment of Depression and Anxiety in Children and Adolescents

Assessment of depression and anxiety requires an awareness and understanding of how the individual feels and thinks about himself or herself and the world around them. Thus, interview or self-report measures are an important source of information. Beginning in the mid-1980s, self-report instruments to assess depressive and anxious symptomatology were developed. The CDI (Kovacs, 1985), the Reynold's Childhood Depression Scale (RCDS; Reynolds, 1989), and the Reynold's Adolescent

Depression Scale (RADS; Reynolds, 1986) are some of the most frequently employed self-report measures of depressive symptomatology for youth; while the State-Trait Anxiety Inventory for Children (STAIC; Speilberger, Gorsuch, & Luchene, 1973) and the RCMAS (Reynolds & Richmond, 1985) are two of the more often utilized measures of youth anxiety. Each of these self-report measures is commercially available, widely used and researched, and has good psychometric properties (Merrell, 1999). However, convergent and discriminant validity issues are well-documented in relation to the measures used with child and adolescent populations. For example, the RCMAS and CDI scores for a sample of 150 adolescents were highly correlated (.70 and .71) with each other at two time points (Tannenbaum, Forehand, & Thomas, 1992). Another study demonstrated that the RCMAS was more highly correlated with the CDI, than it was with other measures of anxiety, such as the STAIC (Hodges, 1990). Findings such as these suggested that self-report measures of depression and anxiety were not measuring two distinct constructs and further fueled the debate about whether anxiety and depression were unique disorders, a single construct related to global distress, or if the assessment measures lacked the specificity to identify and distinguish the disorders.

These findings related to high convergent and poor discriminant validity fueled research in two major directions: the development of instruments that could better assess depression and anxiety, and examination of the relationship between depression and anxiety. These areas of research are discussed later in this literature review. Further, the tripartite model was proposed to explain the observed symptom overlap low discriminant validity of self-report instruments, as well as possibilities for differentiating between the disorders based on self-report measures.

The Tripartite Model: Description and Empirical Support for the Model in Adults

In the tripartite model, NA, PA, and PH are proposed, that when taken together discriminate between depression and anxiety (Clark & Watson, 1991). Negative affectivity refers to an individual's subjective self-report of feeling upset or unpleasantly aroused (Watson, Clark, & Tellegen, 1988). This global emotional distress subsumes a wide range of negative mood states including anger, disgust, dissatisfaction, fear, gloominess, guilt, hostility, loneliness, misery, nervousness, sadness, and worry (Anthony, Lonigan, Hooe, & Phillips, 2002; Clark, Steer, et al., 1994; Joiner et al., 1996, Laurent & Ettelson, 2001; Merrell, 1999; Ollendick et al., 2003). Conversely, individuals with low levels of NA are described as calm, placid, serene, and relaxed (Merrell).

Positive affectivity is associated with the ability and motivation to engage with life and experience pleasure. Positive affectivity refers to an individual's subjective experiences of interest, emotionality, engagement, and energy (Clark, Watson, & Mineka, 1994; Kiernan, Laurent, Joiner, Catanzaro, & MacLachlan, 2001). Individuals with high degrees of PA are described as active, adventurous, alert, cheerful, determined, energetic, enthusiastic, excited, happy, interested, joyful, lively, and proud (Anthony et al., 2002; Kiernan et al.; Laurent & Ettelson, 2001; Merrell, 1999). In contrast, individuals endorsing low levels of PA are described as blunted, drowsy, fatigued, lethargic, sluggish, somnolent, sullen, and weary (Merrell).

The third construct, PH, is the least well defined in the literature. Physiological hyperarousal refers to symptoms associated with autonomic arousal, also described as somatic tension (Chorpita et al., 1998; Joiner et al., 1999; Watson et al., 1995). Specific symptoms include stomach discomfort, difficulty breathing, dizziness, dry mouth,

excessive perspiration, feeling faint, nausea, racing heart, shakiness, shortness of breath, sweaty palms, and trembling (Clark & Watson, 1991; Clark, Watson, et al., 1994; Joiner et al., 1999; Watson, Clark, et al., 1995). Individuals with high PH may also endorse symptoms such as feeling tired or fatigued, feeling restless and having difficulty sitting still, and having sleep difficulties (Chorpita, Plummer, & Moffitt, 2000).

In their model, Clark and Watson (1991) hypothesized that NA is common to both depression and anxiety, and people who are anxious or depressed will report high levels of NA. They further hypothesized that depression and anxiety could be distinguished on the basis of PA and PH. Based on the model, individuals with depression will report low levels of PA associated with the lack of interest or enjoyment of activities and feelings of hopelessness, while reporting low- to average levels of PH. Anxious individuals would be expected to report average levels of PA, however, they would report experiencing high levels of PH associated with the somatic symptoms typical of anxiety. Thus, the tripartite model accounts for the internalized general distress observed in both depressed and anxious individuals, as well as the symptoms unique to each of the disorders.

The Tripartite Model Applied to Adults

Early studies investigating the tripartite model used common self-report measures of depression and anxiety to study the structure of affect. Studies such as the one completed by Clark, Steer, and Beck (1994) employed commonly available measures of depression and anxiety and principal factor analysis to provide preliminary support for NA, PA, and PH. As understanding of the tripartite model and its component constructs evolved, several measures specifically designed for assessing the constructs associated with the model were developed. For example, Watson, Clark, and Tellegen

developed the Positive and Negative Affect Scales (PANAS, 1988) to assess levels of PA and NA, while the Mood and Anxiety Symptom Questionnaire (MASQ) was developed by Watson and Clark (1988, 1991) with the goal of better assessing all three of the factors associated with the tripartite model.

Studies by multiple researchers have demonstrated three factors that correspond to the tripartite dimensions of NA, PA, and PH in undergraduate and community adult samples using exploratory and confirmatory factor analysis (Joiner, 1996; Steer et al., 1994; Watson, Clark, et al., 1995; Watson, Weber, et al., 1995). Additionally, studies employing similar methodologies with clinical samples provided evidence of the tripartite model's utility in distinguishing between clinical diagnoses of depression and specific anxiety disorders (Chorpita & Barlow, 1998; Joiner, 1996). A substantial number of studies have demonstrated that depression and anxiety can be differentiated based on the constructs of the tripartite model with individuals with depression having high levels of NA and low levels of PA, and individuals with anxiety having high levels of NA and PH (Brown, Chorpita & Barlow, 1998; Marshall, Shelbourne, Meredith, Camp, & Hays, 2003; Steer et al., 1994; Watson et al., 1995).

However, several studies have provided more limited support of the tripartite model with adults. Marshall and his colleagues concluded that PH was better viewed as reflective of nonspecific somatic distress than as PH. Additionally, a single study conducted by Burns and Eidelson (1998) concluded that the tripartite model did not fit the results for their samples of college students and outpatients seeking treatment for substance abuse or mood disorder because the general distress (NA) factor did not adequately represent the nonspecific symptoms of anxiety and depression. They concluded that depression was best represented by anhedonia and nonspecific depression that loaded on a second-order depression factor, and anxiety was

represented by somatic arousal and nonspecific anxiety that loaded on a second-order anxiety factor.

Although research has not yielded unanimous support for the model, empirical support for the tripartite model and the three-factor structure of NA, PA, and PH as a means to differentiate and understand depression and anxiety is generally strong in adult populations. This research has guided research in youth populations. Given the importance of accurately distinguishing depression and anxiety and understanding the structure of affect in childhood and adolescence, efforts to replicate the adult findings were undertaken using youth samples, and are discussed in the next sections.

Empirical Support for the Tripartite Model in Children and Adolescents

The application of the tripartite model to children and adolescents first began with studies investigating NA and using self-report measures of depression and anxiety. Studies then focused on two-factor models, generally with NA and PA as constructs of interest. Finally, more statistically complex studies examining models of three or more factors for explaining the structure of affect in children and adolescents were undertaken. This section will provide an overview of that research including the methodology (samples, measures employed, how constructs were assessed, and analyses used) and results.

Assessment of NA, PA, and PH in Children and Adolescents

In their efforts to study the tripartite model in children and adolescents, researchers have used three strategies for assessing NA, PA, and PH. In one strategy,

researchers utilized commonly available measures of childhood depression and anxiety to derive measures of NA, PA, and PH (e.g., selecting key items, using subscale scores). Alternatively, some researchers utilized instruments designed to specifically assess the tripartite constructs. Researchers using a third strategy employed a combination of the commonly available measures of anxiety and depression, as well as the newer measures specifically designed to assess NA, PA, and PH.

When using commonly available measures of depression and anxiety, researchers were challenged because the instruments are not designed to measure NA, PA, or PH. Therefore, researchers needed to create scores or scales to assess the constructs. Some researchers such as Lonigan, Carey, and Finch (1994), and Boyd and Gullone (1997) used exploratory factor analysis to identify CDI or RADS and RCMAS items associated with NA and PA. Other researchers used total and/or subscale scores to assess NA and PA. For example, Cole, Truglio, and Peeke (1997) used total scores, with redundant items eliminated, from the CDI, RCMAS, and peer and teacher reports measures of anxiety and depression as the basis of a confirmatory factor analysis. Yet other researchers selected items from the available measures of depression and anxiety based on the construct validity of the items, using what Joiner and colleagues (1996), called a "rationally selected" approach (Chorpita et al., 1998; Ollendick et al., 2003; Turner & Barrett, 2003). In many cases, the researchers dealt with different instruments within the same study differently. For example, Lonigan and colleagues (1994) used factor analysis to derive three factors from the CDI data while using the available subscale scores from the RCMAS. In yet another approach to handling items not specifically designed to measure the tripartite constructs, Ollendick and his colleagues used a rationally selected approach to assigning items to NA, PA, and PH, but then reduced the number of items using factor analysis (Ollendick et al.).

Using another strategy for assessing the constructs associated with the tripartite model, some researchers utilized instruments specifically designed to assess NA, PA, and PH. Of the three instruments designed specifically to assess constructs associated with the tripartite model, the PANAS (Watson, Clark, et al., 1988) and its variants are most often used. The original adult version of the PANAS is a 20-item measure consisting of two 10-item scales, each consisting of adjective ratings. One scale assesses PA or the extent to which a person feels active, alert, enthusiast; while the other assesses NA or the extent to which a person is experiencing subjective distress including anger, fear, guilt, and worry. While the PANAS was used in an early child and adolescent study by Joiner and colleagues (1996), later studies used a modified version of the PANAS-X, a 60-item adjective rating scale that is an extension of the PANAS also designed to assess NA and PA in adults. In 1999, Laurent and his colleagues developed the Positive and Negative Affect Schedule for Children (PANAS-C). The PANAS-C is similar to the adult versions of the measure and consists of 15 adjective rating items associated with NA and 12 adjective rating items associated with PA. The PANAS-C has been used in four studies of the structure of affect in children and adolescents but has the limitation of assessing only NA and PA.

The Physiological Hyperarousal Scale for Children (PH-C; Laurent et al., 2004), was designed to complement the PANAS-C and thereby provide a means of assessing all three constructs associated with the tripartite model. The 18-item measure requires that respondents rate the adjectives associated with autonomic arousal. To date, the PH-C has not been widely utilized as only one study beyond validation studies were identified that included it as a measure of PH (Jacques & Mash, 2004). The other instrument designed to assess the components of the tripartite model is the Affect and Arousal Scale (AFARS; Chorpita et al., 2000), a 27-item self-report instrument

developed to assess NA, PA, and PH in children and adolescents. The AFARS yields three scores, one for each component construct of the tripartite model. Although two studies were identified that included the AFARS as a measure of PH, it has been far from widely used. Additionally, findings demonstrating the utility of the AFARS for measuring PH have been mixed. Austin and Chorpita (2004) failed to find support for PH as a construct when using the AFARS, while Jacques and Mash (2004) used it to find support for the three-factor model.

In many cases, researchers have employed both traditional measures of child and adolescent depression and anxiety and instruments designed to assess the component constructs of the tripartite model. In studies such as these, researchers used instruments designed to assess NA, PA, and PH, as well as selected items or subscale scores from commonly used measures of depression and anxiety to measure NA, PA, and PH. For example, Lonigan and colleagues (2003), used subscale scores from the CDI and RCMAS, as well as the PANAS-X, to assess NA and PA.

As Table 1 illustrates, the CDI, RCMAS, and PANAS have been used with greater frequency than other instruments. Yet, to date, similarly mixed findings related to the structure of affect in children and adolescents have been obtained regardless of the strategy or instruments used in the studies. Researchers have yet to identify the best strategy or instruments for assessing NA, PA, and PH. Additionally, there exists the possibility that other currently available clinical measures of child and adolescent symptomatology may enhance our ability to assess NA, PA, and PH.

The Tripartite Model Applied to Children and Adolescents: Research Examining NA, PA, and the Structure of Affect

Five studies were identified that used a confirmatory factor analytic approach to examine the structure of affect in children and adolescents, limiting their models to NA

Table 1

Frequency of Studies Using Various Self-Report Measures to Assess NA, PA, and PH

Measure	*N* (19)	% frequency
Affect and Arousal Scale (AFARS)	3	15.79
Children's Depression Inventory (CDI)	13	68.42
Positive and Negative Affect Schedule (PANAS)[a]	7	36.84
Revised Child Anxiety & Depression Scale (RCADS)	2	10.53
Revised Children's Manifest Anxiety Scale (RCMAS)	14	73.68
State Trait Anxiety Scale-Children (STAIC)	2	10.53
Other[b]	7	36.84

[a]Includes all forms of the PANAS (PANAS, PANAS-X, PANAS-C). [b]Includes studies that utilized instruments used in only one study (Baltimore How I Feel; Child Behavior Checklist; Dominic, Peer Nomination Index of Depression; Reynold's Adolescent Depression Scale; Spence, Penn State Worry Questionnaire for Children; Physiological Hyperarousal Scale for Children; Teacher Report Index of Anxiety; and Teacher Report Index of Depression.

and PA. Cole and colleagues (1997), conducted the first of these studies. They found different models were necessary to fit the data from older and younger children and these developmental differences are discussed later. The remaining studies found support for a two-factor model of NA and PA using a variety of measures and samples. For example, Lonigan, Hooe, and colleagues (1999) used two community samples; 152 fourth and fifth grade students, ages 9 to 11 years old, and 213 students ages 12 to 17 years old. Participants completed the Positive and Negative Affect Schedule--Expanded Form (PANAS-X), the CDI, and the RCMAS. Using CFA, they tested six models including a one-factor, a two-factor oblique, a two-factor orthogonal, several four-factor models. The four-factor models used item groupings previously utilized by Lonigan and his colleagues and subdivided NA into anger and fearful, and PA into activation and heartiness. They determined that the two-factor orthogonal model of PA and NA (x^2 = 218.88, *df* = 170, RCFI = .94, RMSEA = .05, A1C = -64.86 for older

sample, and x^2 = 212.83, *df* = 170, RCFI = .88, RMSEA = .06, A1C = -64.86 for the younger sample) fit the data better than a one-factor, two-factor oblique, or any of the four-factor models. Lonigan, and his colleagues then examined the relationship between the latent NA and PA factors and self-reported symptoms of anxiety and depression. Their results supported the expected pattern of relation of NA and PA with symptoms of depression and anxiety. They found that NA and PA accounted for 53% of the variance in CDI scores and between 21% and 37% of the variance in RCMAS scores. PA accounted for 13% of the unique variance in CDI scores, but only 2% of the unique variance in the RCMAS Worry subscale score. PA contributed an average of 6% of the unique variance across the other RCMAS subscale scores. Their findings were consistent with the tripartite model in terms of NA and PA.

Lonigan and colleagues (2003) then extended their previous research in a longitudinal study using the same instruments and a sample of 270 students. Again, they found support for a two-factor orthogonal model of children's self-reported affect and for the relations of NA and PA to symptoms of anxiety and depression. Furthermore, structural equation modeling demonstrated that PA and NA have moderate stability over time.

Austin and Chorpita (2004) examined NA and PA as temperament characteristics related to the tripartite model of anxiety and depression and found support for a two-factor model of affectivity. Using a school-based sample of 1,155 children of five different ethnicities in Grades 3 through 12, they administered the Revised Child and Anxiety and Depression Scale (RCADS; Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000) and the Affect and Arousal Scale for Children (AFARS; Chorpita et al., 2000). Although the AFARS includes a PH scale, the authors did not include it in their analyses.

In examining the structure of affect, they found good fit for a multisample (across ethnicity) model relating NA and PA to anxiety and depression (x^2 = 1.782.73, *df* = 1150, GFI = .92, RMSEA = .022, CFI = .94, SRMSR = .053). They concluded that the two-factor model of NA and PA was invariant across ethnic groups, suggesting that the generalizability of the tripartite model to youth of different ethnicities was appropriate.

Most recently, Bushman (2004) examined the structure of affect by examining NA and PA. He administered the PANAS-C, CDI, RCMAS, and MASC (Multidimensional Anxiety Scale for Children; March, 1997) to a school-based sample of third and sixth graders (*n* = 105). Bushman used packets of items from the NA and PA subscales from the PANAS-C as data for a CFA, and demonstrated that the two-factor oblique and two-factor orthogonal models demonstrated adequate fit across the two samples (x^2 = 45.61, GFI = .89, AGFI = .77, CFI = .90, NNFI = .85, RMSEA = .15, SRMR = .11 for the two-factor orthogonal model for the third grade sample; x^2 = 42.32, GFI = .89, AGFI = .77, CFI = .90, NNFI = .85, RMSEA = .15, SRMR = .082 for the two-factor oblique model for the third grade sample, and x^2 = 35.41, GFI = .94, AGFI = .87, CFI = .95, NNFI = .92, RMSEA = .10, SRMR = .086 for the two-factor orthogonal model for the sixth grade sample; x^2 = 33.57, GFI = .94, AGFI = .86, CFI = .95, NNFI = .92, RMSEA = .11, SRMR = .068 for the two-factor oblique model for the sixth grade sample).

Summaries of these studies of two-factor models for the structure of affect, including assessment strategies utilized, are provided in Table 2. These studies demonstrate significant support for a two-factor model of affect in children and adolescents. While these studies provide preliminary support for the tripartite model (the component constructs of NA and PA), each of them examined only NA and PA. To gain

Table 2

Studies Examing NA, PA, and the Structure of Affect in Children and/or Adolescents

	Sample	Authors	Constructs assessed	Scale construction/ analysis	Results
Cole, Truglio, & Peeke (1997)	491 students: 280 3rd grade students, 211 6th grade students	CDI, PNAI PNID RCMAS TRIA TRID	anxious Sx, depressed Sx teacher, peer endorsement of anxious and depressed Sx	total scores, redundant items eliminated (CFA)	Depression and anxiety are indistinguishable at younger ages (unified construct); older children demonstrate increased differentiation and preliminary support for tripartite model
Lonigan, Hooe, David, & Kistner (1999)	365 students: 152 students ages 9-11 years, 213 students ages 12-17 years	CDI, PANAS-X, RCMAS	anxious Sx, depressed Sx, NA, PA	total and subscale scores (CFA)	two-factor orthogonal model best fit data, some age differences observed
Lonigan, Phillips, & Hooe (2003)	270 students in Grades 4-11	CDI, PANAS-X, RCMAS	anxious Sx, depressed Sx, NA, PA	total and subscale scores (CFA)	two-factor orthogonal model best fit data, but age-related differences in self-reports were observed; moderate cross-time stability of NA and PA
Austin & Chorpita (2004)	1155 students in Grades 3-12	RCADS, AFARS	depression and anxiety disorder Sx, NA, PA, (PH not used)	total and subscale scores (MANOVA and CFA)	two-factor model of temperament consisting of NA and PA was found to have good fit; significant mean score differences on dimensions were observed across ethnic groups
Bushman (2004)	106 students: 45 3rd grade students, 60 6th grade students	PANAS-C, MASC, CDI, RCMAS	anxious Sx, depressed Sx	total and subscale scores (CFA)	Supported two-factor correlated and uncorrelated models as having good fit for data; developmental differences observed

Note. AFARS: Affect and Arousal Scale; CDI: Children's Depression Inventory; MASC: Multidimensional Anxiety Scale for Children; PANAS-C: Positive and Negative Affect Schedule for Children; PANAS-X: Positive and Negative Affect Schedule–Expanded Form; PNIA: Peer Nomination Index of Anxiety; PNID: Peer Nomination Index of Depression; RCADS: Revised Child Anxietya nd Dperession Scale; RCMAS: Revised Children's Manifest Anxiety Scale; TRIA: Teacher Report Index of Anxiety; TRID: TeacherReport Index of Depression.

a better understanding of the tripartite model, it is necessary to examine three-factor models that include NA, PA, and PH.

The Tripartite Model Applied to Children and Adolescents: Research Examining NA, PA, PH, and the Structure of Affect

The earliest of the studies to examine the tripartite structure of affect in children and adolescents was conducted by Joiner and colleagues (1996). They examined the structure of affect in a sample of 116 child and adolescent psychiatric inpatients between the ages of 8- and 16-years-old who completed the CDI, RCMAS, and a modified version of the PANAS (Watson, Clark & Tellegen, 1988), using exploratory factor analysis (EFA). Instead of using total and subscale scores from the CDI and RCMAS, the authors employed a rationally selected item approach to assign items to assess PA (CDI items 4, 12, 21; RCMAS item 23), NA (CDI items 1, 10, 11; RCMAS items 6, 7, 9, 10, 14, 30, 34, 37), and PH (RCMAS items 5, 17, 19). Joiner and his colleagues then used a principal component analysis with oblique rotation and found that the items loaded in the expected ways, with a three-factor solution being most defensible. Loadings for items on the three components ranged from .39 to .73 for PA, from .26 to .77 for NA, and from .56 to .72 for PH. The factor intercorrelations were low (-.10 for NA and PA, -.16 for PA and PH, .26 for NA and PH) and suggested a nonhierarchical arrangement of factors. The authors concluded that the tripartite model provided a good fit for the data obtained from their sample of inpatient children and adolescents.

Subsequent studies employed CFA to examine the tripartite structure. Although five studies provided support for NA and PA, an equal number of studies demonstrated support for the three-factor model of NA, PA, and PH. In 1998, Chorpita, and colleagues, administered the Anxiety Disorders Interview Schedule for Children/Parents

(ADIS-IV), CDI, RCMAS and CBCL to a sample of 216 clinically referred children and adolescents ages 6 through 17 years, diagnosed with either an anxiety disorder or an anxiety disorder with a comorbid mood disorder. The authors examined anxiety, depression, and fear rather than NA, PA, and PH. They tested six models including a one-factor model, a two-factor model in which fear and anxiety were loaded on one factor and depression on the other, a two-factor model in which depression and anxiety loaded on one factor with fear on the other, and three different three-factor models. The models of best fit were the modified three-factor models that controlled for the influence of parent measure variance and for the correlation among parent and child measures simultaneously (x^2 = 9.82, *df* = 8, GFI = .99, RMSEA = .03, CFI = 1.00, x^2 = 12.26, *df* = 5, GFI = .98, RMSEA = .008, CFI = .98, respectively). The authors concluded that their findings supported the tripartite model because their conceptualization of depression, anxiety, and fear "bears similarity to existing theories of anxiety and depression (Clark & Watson, 1991" (Chorpita et al., 1998, p. 82). They further explained that anxiety corresponds to NA, depression corresponds to low PA, and fear corresponds to PH and that the latent constructs, while reasonably distinct, are correlated.

Chorpita (2002) examined the tripartite model and dimensions of anxiety and depression in a large school-based sample (*n* = 1,579) of children and adolescents in grades three through twelve. He used the Spence Children's Anxiety Scale (SCAS; Spence, 1997), a measure designed to assess for symptoms associated with particular DSM-IV diagnoses. He also used 27 items from the RCMAS and CDI that had previously demonstrated utility in assessing NA, PA, and PH. For the initial model Chorpita tested a model of NA, PA, and PH, with PH paths to depression and various anxiety disorders. The model failed to meet the criterion for good model fit (x^2 = 1512.63, *df* = 298, Cfit = 1.00, GFI = .93, CFI = .93, RMSEA = .065, CFI = 1.00, A1C =

1672.63). He then tested the adult model proposed by Brown and colleagues (1998) that included PH at a lower conceptual level and consequential to Panic and NA, which provided acceptable fit (x^2 = 1210.00, *df* = 300, Cfit = 1.00, GFI = .94, CFI = .95, RMSEA = .044, CFI = .95, A1C = 1357.00). These findings support the general utility of the tripartite model, but raise questions related to the relationship between PH and the various anxiety disorder dimensions.

Turner and Barrett (2003) investigated the tripartite model in a sample of 1,844 children in the third, sixth, and ninth grades. They administered the RCMAS and CDI to assess NA, PA, and PH. Turner and Barrett completed their analyses using both the rationally selected items first identified by Chorpita, Plummer, and Moffitt (2000). Using those item assignments in CFAs, the unitary, dual, and tripartite models all provided adequate fit for the data, but the Akaike information criterion (AIC) indicated that the three-factor tripartite model provided the best and most parsimonious model across grade levels (for example, for the sixth grade sample x^2 = 318.01, *df* = 152, RMSEA = .06, CFI = .93, IFI = .93, A1C = 432.01; x^2 = 227.04, *df* = 151, RMSEA = .05, CFI = .94, IFI = .94, A1C = 393.04; x^2 = 260.03, *df* = 149, RMSEA = .05, CFI = .95, IFI = .95, A1C = 380.03, for the unitary, dual, and tripartite models, respectively).

Lambert and colleagues (2004) examined the structure of anxiety in a sample of African American youth in an urban area. They collected longitudinal data using the Baltimore How I Feel, a measure of depressed and anxious symptoms, when subjects were in sixth and ninth grade. At both grade levels, a three-factor oblique model of anhedonia, NA, and PH was adequate and significantly better than a two-factor model of NA and PA or a one-factor unified model (x^2 = 595.10, *df* = 252, CFI = .87, TLI = .85, RMSEA = .054; x^2 = 547.87, *df* = 251, CFI = .88, TLI = .87, RMSEA = .050; x^2 = 494.74, *df* = 249, CFI = .90, TLI = .89, RMSEA = .046; for the one-, two-, and three-factor

models, respectively, for the sixth grade sample). The authors also reported correlations indicative of high overlap among the tripartite dimensions based on scale scores generated for the rationally selected items, including a significant positive association between NA and PH (r = .71), anhedonia and PH (r = .72), anhedonia and NA (r =.84), a finding in opposition to those of Chorpita and colleagues (1998), Joiner and colleagues (1996) and Chorpita and colleagues (2000). Lambert and colleagues (2004) concluded that the tripartite model adequately represents the structure of depressive and anxious symptoms in a community sample of AfricanAmerican adolescents; however, they did identify some developmental differences that they hypothesized to be related to cultural differences in the manifestation of depression in African American adults. These findings are explained in the section on developmental changes in the structure of affect.

Recently, Jacques and Mash (2004) examined the structure of anxiety and depression in elementary and high school students. The 472 subjects for this study completed the PANAS-C, AFARS, PH-C, CDI, and STAIC. In examining the zero-order correlations between the various measures of the study, they found a correlation of .71 between the CDI and STAIC (the instruments used to identify depression and anxiety) that potentially obscured conclusions regarding "pure" depression and anxiety. However, the patterns of correlations between the tripartite constructs was as expected with PANAS-NA and AFARS NA being significantly and positively correlated with depression and anxiety (r range from .61 to .72), AFARS PA and PANAS-C PA being negatively correlated with depression (r = -.38 and -.49, respectively) and both measures of PH being positively related to anxiety (r = .68 for the PH-C, and r = .57 for the AFARS PH). Using data from the PANAS-C, AFARS, and the PH-C, the authors identified a three-factor model that provided the best fit to the data (x^2 = 143.87, df = 16, GFI = .93, AGFI = .84, SRMR = .074) and accounted for 71% of the variance in depression and

73% of the variance in anxiety. However, the path coefficient between NA and PH ($\phi_{NA\text{-}PH} = .70$, $p < .05$), suggested that NA and PH are strongly related. Nevertheless, these findings provided support for the tripartite model of affect.

Although most of the CFA studies examining NA, PA, and PH found support for the three constructs, two studies did not. Ollendick and colleagues (2003) compared one-, two-, and three-factor models, including those for NA alone; depression and anxiety; and NA, PA, and PH. Their sample of 510 included students in 4th, 7th, and 10th grades who completed the CDI and the RCMAS. The authors rationally selected items from the CDI and RCMAS as assessing NA, PA, or PH and then used principal component analysis to further reduce the number of indicators contributing to the latent variables. The authors examined the sample as a whole and as subsamples based on age. For the full sample, they found that both the two- and three-factor models provided relatively good fit to the data ($x^2 = 387.84$, $df = 44$, GFI = .84, AGFI = .76, SRMR = .067; $x^2 = 248.80$, $df = 48$, GFI = .91, AGFI = .86, SRMR = .067; $x^2 = 366.27$, $df = 41$, GFI = .91, AGFI = .86, SRMR = .066; for the one-, two- and three-factor models, respectively). However, an examination of the difference in chi-square values for the models suggested that although the two latent variables of the two-factor model were highly correlated ($r = .78$), they provided a significantly better fit than the three-factor model ($x^2_{diff} = 117.43$, $p < .001$). Ollendick and his colleagues identified developmental changes among the different age samples. They concluded that their findings failed to support the tripartite model of depression and anxiety, particularly the construct of PH, but maintained the distinguishability of depression and anxiety as distinct disorders in youth.

Additionally, Chorpita and colleagues (2000) examined the structure of affect in a clinically referred outpatient sample of youth ages 6 through 17 years old. The authors used clinical interview data from the ADIS-IV, the RCMAS, and the CDI, and clinician

severity rating assigned based on ADIS-IV obtained for 100 youth. For this study, the authors used two different sets of tripartite scale definitions for rationally selected item assignment based on the previous research from an EFA by Joiner and colleagues (1996) and a CFA by Chorpita and colleagues (1998). Although the authors identified two- (NA and PA) and three-factor (NA, PA, and PH) models of adequate fit, neither provided a parsimonious model because the covariance among the dimensions was not well explained (x^2 = 14.86, *df* = 10, GFI= .97, RMSEA = .071, CFI = .96, A1C = 84.86; x^2 = 6.58, *df* = 10, GFI= .99, RMSEA = .032, CFI = 1.00, A1C = 79.58; for the Chorpita scale and Joiner scale two-factor models, and x^2 = 5.61, *df* = 8, GFI= .99, RMSEA = .000, CFI = .99, A1C = 79.61; x^2 = 4.93, *df* = 8, GFI= .99, RMSEA = .000, CFI = 1.00, A1C = 78.93 for the three-factor models using the Chorpita and Joiner scales, respectively). According to the authors, because neither model fully explained the covariance among depressive and anxious symptoms, it is not possible to conclude that one model is preferable to another for explaining the structure of affect in children and adolescents.

Summaries of these studies examining three-factor models for the structure of affect, including information about the samples and assessment strategies, are provided in Table 3. While the majority of studies examining NA, PA, and PH found support for a tripartite structure of affect, two of the studies did not. While one of those two studies demonstrated support for a two-factor model that distinguished depression and anxiety, the other study failed to identify any parsimonious model.

Table 3

Studies Examining NA, PA, PH, and the Structure of Affect in Children and/or Adolescents

Authors	Sample	Authors	Constructs assessed	Scale construction/ analysis	Results
Joiner, Catanzaro, & Laurent (1996)	116 psych inpatients, ages 8-16	CDI, PANAS, RCMAS	anxious Sx, depressed Sx, NA, PA	assigned CDI and RCMAS items to NA, PA, and PH on rational grounds, PANAS NA and PA scales (EFA)	three-factor model of PA, NA, and PH in nonhierarchical arrangement best fit data; factor intercorrelations were low regardless of whether two- or three-factor models were used
Chorpita, Albano, & Barlow (1998)	216 children dx with anxiety or comorbid anxiety and mood disorders, ages 6-17	CBCL, CDI, RCMAS	anxious Sx, depressed SC, internalizing and externalizing Sx	items from the CBCL Internalizing Scale, CDI, and RCMAS were reclassified into fear, anxiety, and depression using the MASQ as a guide (CFA)	three-factor model of fear (PH), anxiety (NA), and depression (low PA) best fit data
Chorpita, Plummer, & Moffitt (2000)	100 clinically referred children and adolescents, ages 6-17	ADIS-IV, RCMAS, CDI	NA, PA, PH, DSM-IV anxiety or mood disorder Sx	conducted all analyses using rationally selected items replicating factors used in Joiner et al. (1996) and Chorpita et al. (1998) (CFA)	support for NA and PA. PH correlated with Panic Disorder (Joiner et al.) And Separation Anxiety, Panic, and Depression (Chorpita et al.). No parsimonious model was identified (compared two- and three-higher order factor models)
Chorpita (2002)	1578 students in Grades 3-12	Spence Children's Anxiety Scale, 27 items form RCMAS & CDI	anxious Sx depressed Sx	total and subscale scores (CFA)	three-factor model provided best fit for data; however, some age-related differences in relation of tripartite model dimensions to depression and anxiety.

(*table continues*)

Authors	Sample	Authors	Constructs assessed	Scale construction/ analysis	Results
Ollendick, Seligman, Goza, Byrd, & Singh (2003)	510 students in 4th, 7th, or 10th grade	CDI, RCMAS	anxious Sx, depressed Sx	rationally assigned items to anxiety/depression or NA, PA, PH–PCA used to reduce number of items	two-factor model including depression and anxiety best fit data; failed to support the tripartite model; some age-related differences were observed.
Turner & Barrett (2003)	1844 students: 331 students ages 6-8 years, 631 students ages 10-11 years, 882 students 13-14 years	BHI, CASI, CDI, HSC, RCMAS	anxious Sx depressed Sx	rationally assigned items using Chorpita et al. (2000) as model (CFA	three-factor model of NA, PA, and PH fits data best; support for model invariance across ages
Jacques & Mash (2004)	472 students: 246 4th-5th grade students, 218 10th-11th grade students	PANAS-C, PH-C, AFARS, CDI, STAIC	anxious Sx, depressed Sx, NA, PA, PH	total and subscale scores (ANOVA, correlations, CFA)	three-factor model best fit data, age-related differences, including age x gender interactions, were observed; some findings were inconsistent with tripartite model
Lambert, McCreary, Joiner, Schmidt, & Ialongo (2004)	467 students assessed in 6th and 9th grade	Baltimore HIF	anxious Sx depressed Sx	rationally assigned items to NA, PA, PH (CFA)	three-factor model provides best fit for data; structure is invariant across age groups

Note. ADIS-IV: Anxiety Disorders Interview Schedule for DSM-IV; AFARS: Affect and Arousal Scale; Baltimore HIF: Baltimore How I Feel Inventory; BHI: Beck Hopelessness Inventory; CASI: Childhood Anxiety Sensitivity Index; CBCL: Child Behavior Checklist; CCL: Cognitive Checklist; CDI: Children's Depression Inventory; HSC: Hopelessness Scale for Children; PANAS: Positive and Negative Affect Schedule; PANAS-C: Positive and Negative Affect Schedule for Children; PH-C: Physiological Hyperarousal Scale for Children; RCMAS: Revised Children's Manifest Anxiety Scale; STAIC: State-Trait Anxiety Scale for Children.

The Tripartite Model Applied to Children and Adolescents: Research Utilizing Clinical Samples

Only five of the 26 identified research studies related to the structure of affect in children and adolescents focused on increasing our understanding of the tripartite model in clinical samples. Of those studies, two utilized clinicallyreferred samples, while the other three used inpatient psychiatric samples. Although some differences may exist in the characteristics of inpatient and outpatient samples, they are similar in regards to the diagnostic criteria required for inclusion in the various studies and for that reason are presented together. As is the case in the larger body of research examining the structure of affect in children and adolescents, the research examining the structure of affect in clinical samples of youth includes studies that examined only NA and PA, and those that considered NA, PA, and PH.

Lonigan and colleagues (1994) conducted the first study related to the tripartite model using a sample of inpatient children and adolescents. They utilized a sample of 233 youth ages 6 to 17 years, who were admitted for psychiatric inpatient treatment. Subjects completed the CDI and the RCMAS and were provided a *Diagnostic and Statistical Manual of Mental Disorders (3rd ed.;* DSM-III; American Psychiatric Association, 1980) or *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., revised; DSM-III-R; American Psychiatric Association, 1987) diagnosis based on a semistructured interview and observations by multiple professionals. ANOVAs conducted to examine the differences between the depressed and anxious groups, produced statistically significant differences with the depressed group scoring significantly higher than the anxious group for CDI Total Score, $F(1,229) = 13.71$, $p < .001$, and higher than the anxious group on the self-dissatisfaction and low interest/low motivation factors, $F(1,229) = 15.31$, $p < .001$, and $F(1,229) = 21.92$,

$p < .001$, respectively. Additionally, anxious children and adolescents scored significantly higher than their depressed peers on the worry factor from the RCMAS, $F(1,229) = 4.49$, $p < .04$. However, the anxious and depressed groups did not differ significantly on the depressed affect factor from the CDI or the physiological and concentration factors from the RCMAS. These findings support the conclusion that childhood and adolescent depression and anxiety share a common component of negative affectivity (depressed affect); however, anxiety and depression are distinguishable based unique differences observed through the use of the CDI and RCMAS self-report measures in inpatient children and adolescents. Although Lonigan and his colleagues' results did not support the tripartite model in regards to PH, they attributed the failure to the heterogeneous nature of the items related to PH included in the RCMAS. These findings provided preliminary support for the tripartite model, particularly NA as a feature common to both depression and anxiety, and low PA as a feature distinguishing depressed youth from anxious ones.

Joiner and Lonigan (2000) examined the relation of the depression aspect of the tripartite model (NA and PA) to diagnostic status using two small samples of child and adolescent inpatients ($n = 41$ and $n = 33$) with primary diagnoses of either depressive disorders or externalizing disorders. Their first sample used extant data, while the second included a longitudinal component with time between baseline and follow-up spanning 2 months. Joiner and Lonigan utilized CDI, PANAS-C, and RCMAS data, in addition to diagnostic status in regression equations. Their results for both samples indicated that the depressive aspect of the tripartite model of depression and anxiety (low PA and high NA) was significantly related to the diagnostic status variable, $pr = -.30$, $t(37) = -2.05$, $p < .05$, for the child and adolescent inpatient data. Additionally, when they examined the correlation of NA to diagnostic status using a median split on

PA, they found that subjects with high NA and low PA were more likely to receive a depressive diagnosis ($r = .47$, $p < .05$), while youth in the high PA sample were not ($r = -.29$, $p > .05$). They concluded that their findings indicated that NA and PA (the depression aspect of the tripartite model) represented a "good fit to the data generated by child and adolescent psychiatric inpatients" (p. 377), and that the tripartite model would have utility in distinguishing between depression and externalizing disorders. Unfortunately, the study did not include subjects with primary diagnoses other than depressive disorders or disruptive behavior disorders that may have provided a more complete picture.

The three studies that examined NA, PA, and PH in clinical samples of children and adolescents used a variety of approaches including both exploratory and confirmatory factor analysis. Two of the studies demonstrated support for NA, PA, and PH, while the third study failed to identify a parsimonious model of fit. As discussed in a previous section, Joiner and colleagies (1996) demonstrated support for the hypothesized three-factor structure of the tripartite model in a sample of 116 child and adolescent psychiatric inpatients between the ages of 8 and 16 years old. They did not focus on particular disorders, but rather examined syndromal constructs in youth who did not necessarily meet the diagnostic criteria for diagnoses of depression and anxiety, but who endorsed high levels of depression and anxiety on self-report measures based on total RCMAS and CDI scores. Using items from the RCMAS and CDI, they employed a rationally selected item approach to assign items to assess PA, NA, and PH. They used a principal component analysis with oblique rotation and found a three-factor solution was most defensible. For the three-factor solution the intercorrelations were low and suggested a nonhierarchical arrangement of factors (-.16, -.10, and .26). Correlations between the PANAS NA and PA scales and the rationally assigned PA, NA,

and PH scales provided additional support for the constructs (r = .61 for PANAS PA and PA, r = -.12 for PANAS PA and NA, r = -.19 for PANAS PA and PH; and r = -.21 for PANAS NA and PA, r = .54 for PANAS NA and NA, r = .36 for PANAS NA and PH) . The authors concluded that depression and anxiety are distinguishable as separate disorders based on PA and PH. Additionally, the tripartite model of depression and anxiety, with component constructs of NA, PA, and PH, provided a good fit for the data obtained from their sample of inpatient children and adolescents.

Chorpita was the primary researcher on a series of studies employing clinically referred samples of children and adolescents (Chorpita et al., 1998; Chorpita & Daleiden, 2002; Chorpita et al., 2000). In 1998, Chorpita, Albano, and Barlow conducted research utilizing a sample of 216 clinically referred youth who were subsequently diagnosed with either an anxiety disorder alone or an anxiety disorder with a comorbid mood diagnosis. The youth were administered the RCMAS and CDI and participated in a clinical interview (Anxiety Disorders Interview Schedule for Children/Parents; ADIS-IV]) with their parent and a researcher. Their parents completed the Child Behavior Checklist (CBCL). The researchers made a priori item assignments based on theoretical models of the emotions for selected items of the CDI and RCMAS to one of three factors of interest (anxiety, depression, fear) to create scales for anxiety, depression, and fear. Using confirmatory factor analysis, they obtained strong support for their three-factor model of NA (anxiety), PA (depression), and PH (fear; x^2 = 9.82, df = 8, GFI = .99, CFI = 1.00, p = .28), as compared to one-factor model of distress and two-factor model of anxiety and depression that did not fit the data as well (x^2 = 131.42, df = 14, GFI = .85, CFI = .70, p = .00, and x^2 = 122.84, df = 13, GFI = .85, CFI = .72, p = .00, respectively).

In 2000, Chorpita and colleagues conducted a study that examined the relation between higher-order models of the tripartite structure and the severity of depressive and anxiety disorders in a sample of 100 clinically referred children and adolescents, ages 6 through 17 years old. They used data from the RCMAS, CDI, ADIS-IV clinical interviews, and clinician severity ratings. The authors used two different sets of tripartite scale definitions and item assignments based on the previous research by Joiner and colleagues (1996) and Chorpita and colleagues (1998) and conducted all analyses for each set of item assignments. Their results indicated that NA was positively and significantly correlated with severity for all DSM anxiety and mood syndromes, with the exception of separation anxiety and social anxiety for both sets of item assignments. PA was significantly and negatively correlated with depression, panic, and social anxiety; and PH was significantly positively correlated with separation anxiety, panic, and depression, when the Chorpita and colleagues' scale assignments were used. Use of the Joiner and colleagues' item assignments produced similar results, except for PH that had a significant correlation with only panic. In regards to identification of a model of best fit, the authors first evaluated the two-factor adult model proposed by Brown and colleagues (1998) that identified a structure where NA had influence on all the anxiety and mood disorders, while PA had influence on depression and social anxiety, with PH being consequential to panic disorder and NA. They also tested an alternative model that included all three emotional dimensions as higher order factors and they modified the role of PH to influence panic and separation anxiety (as opposed to being consequential to them). Both models fit the data well regardless of the item assignments used (the fit statistics are provided in a previous section); however, neither model was parsimonious because neither model indicated that covariance among the disorders was completely attributable to the tripartite dimensions, regardless of whether the Chorpita

and colleagues' or Joiner and colleagues' item assignments were used and the authors concluded that "it may be premature to conclude that one structure is preferable to another" (p. 307). Despite this, the predictions that NA was significantly related to GAD, Panic and OCD, and that PA was significantly related to depression and social anxiety were supported. Conversely, there were several unexpected findings. NA was not related to depression, social anxiety, or separation anxiety with either of the models, and PH demonstrated a positive relation with only separation anxiety using the Chorpita and colleagues' scales and only panic using the Joiner and colleagues' scales. Despite the mixed findings related to specific *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; DSM-IV; American Psychiatric Association, 1994) diagnoses, and failure to identify one model of best fit for the data from the clinical sample of child and adolescents, the study provides general support for the constructs underlying the structure of affect and that differences exist among youth diagnoses with depression and anxiety disorder diagnoses

In summary, the results of studies examining the structure of affect in clinical samples of children and adolescents are mixed in regard to how to best describe the structure of affect. Brief overviews of these studies are presented in Table 4. Some provide support for NA and PA, while others provide support for NA, PA, and PH, and another concludes that while both fit the data adequately neither model is parsimonious. At this point, there is not clear support for either a two- or three-factor model. Additionally, the clinical studies are limited by small sample sizes, and in some cases, the lack of pure or homogeneous diagnostic categories. These limitations have hindered our ability to determine if the tripartite structure is invariant for groups of youth with different mental health diagnoses.

Table 4

Studies Examining the Tripartite Model in Clinical Samples of Children and/or Adolescents

	Sample	Authors	Constructs assessed	Scale construction/ analysis	Results
Lonigan, Carey, & Finch (1994)	233 psych inpatients, ages 6-17	CDI, RCMAS	anxious Sx, depressed Sx	3 CDI factors based on factor analysis, RCMAS subscales, total scores (EFA, correlation analyses, and ANOVA)	NA common to anxiety and depression; PA may distinguish between anxiety and depression
Joiner, Catanzaro, & Laurent (1996)	116 psych inpatients, ages 8-16	CDI, PANAS, RCMAS	anxious Sx, depressed Sx, NA, PA	Rationally assigned CDI and RCMAS items to NA, PA, and PH, PANAS NA and PA scales (EFA)	three-factor model of PA, NA, and PH in nonhierarchical arrangement best fit data
Chorpita, Albano, & Barlow (1998)	216 children dx with anxiety or comorbid anxiety and mood disorders, ages 6-17	CBCL, CDI, RCMAS	anxious Sx, depressed Sx, internalizing and externalizing Sx	Items from the DBCL Internalizing Scale, CDI, and RCMAS were evaluated and reclassified into fear, anxiety, and depression groupings using the MASQ as a guide (CFA)	three-factor model of fear (PH), anxiety (NA), and depression (low PA) best fit data
Chorpita, Plummer, & Moffitt (2000)	100 clinically referred children and adolescents, ages 6-17	ADIS-IV, RCMAS, CDI, clinical severity ratings	NA, PA, PH, DSM-IV anxiety or mood disorder Sx	conducted all analyses using rationally selected items replicating factors used in Joiner et al. (1996) and Chorpita et al. (1998) (CFA)	Support for NA and PA. PH correlated with Panic Disorder (Joiner et al.) And Separation Anxiety, Panic, and Depression (Chorpita et al.). No parsimonious model was identified (compared 2- and 3 higher order factor models)

(*table continues*)

	Sample	Authors	Constructs assessed	Scale construction/ analysis	Results
Joiner & Lonigan (2000)	74 psych inpatients, ages 7-17 (dx included Major Depression, Depressive Disorder NOS, Conduct Disorder, ADHD)	CDI, PANAS-C, RCMAS	anxious Sx depressed Sx, NA, PA	PANAS NA and PA scales, CDI and RCMAS total scores (multiple regression analysis)	Tripartite constructs h ave utility in distinguishing between depression and other diagnoses; high NA and low PA differentiated depression from externalizing disorders; high NA predictive of future depressive symptoms while low PA is not

Note. ADISI-IV: Anxiety Disorders Interview Schedule for DSM-IV; CBCL: Child Behavior Checklist; CDI: Children's Depression Inventory; PANAS-C: Positive and Negative Affect Schedule for Children; RCMAS: Revised Children's Manifest Anxiety Scale.

The Tripartite Model Applied to Children and Adolescents:Research Examining Developmental Changes in the Structure of Affect

Much of the previously discussed research utilized single samples of children and adolescents, collapsing a wide age range into a single group. Across studies that examine the tripartite model comparing samples of children or adolescents based on age, findings have been mixed. Some have found that the structure of affect is invariant across age groups (Chorpita et al., 1998; Chorpita et al., 2000; Lambert et al., 2004; Lonigan et al., 2003; Turner & Barrett, 2003), while others have found differences in the differentiation of constructs or in the relation of constructs to symptoms (Bushman, 2004; Chorpita, 2002; Cole et al., 1997; Jacques & Mash, 2004; Lonigan et al., 1999; Ollendick et al., 2003). Selected findings from these eleven studies are presented in this section and each is summarized in Table 5.

Cole and colleagues (1997) were the first to conduct research that examined developmental differences in the structure and identified the most marked differences in the structure of affect across samples of youth of different ages. They used a multitrait-multimethod-multigroup approach with a sample of 280 third-grade and 211 sixth-grade students. From data obtained from teachers, peers, and the subjects themselves, they separated variance into trait, method, and random error variance. They found method loadings that were higher than trait loadings, especially for younger children. They also found the correlation between depression and anxiety to be very high (r = .90) for the third-grade students and slightly lower for the sixth-grade students (r = .72). Based on these observations they tested a one-factor model with younger students and a two-factor model for the older students. These models provided good fit for the data (third

Table 5

Studies Examining Developmental Differences in the Structure of Affect

Authors	Sample	Authors	Constructs assessed	Scale construction/ analysis	Results
Cole, Truglio, & Peeke (1997)	280 3rd grade students, 211 6th grade students	CDI, PNAI, PNID, RCMAS, TRIA, TRID	anxious Sx, depressed Sx, teacher, peer endorsement of anxious and depressed Sx	total scores, redundant items eliminated (CFA)	Depression and anxiety are indistinguishable at younger ages (unified construct); older children demonstrate increased differentiation and preliminary support for tripartite model
Chorpita, Albano, & Barlow (1998)	80 children ages 6-11 years, 136 adolescents ages 12-17	CBCL, CDI, RCMAS	anxious Sx, depressed Sx, internalizing and externalizing Sx	items from the DBCL, CDI, and RCMAS were reclassified into fear, anxiety, and depression groups (CFA)	three-factor model of fear, anxiety, and depression provides best fit for all samples; structure is invariant across age groups
Lonigan, Hooe, David, & Kistner (1999)	152 students ages 9-11 years, 213 students ages 12-17 years	CDI, PANAS-X, RCMAS	anxious Sx, depressed Sx, NA, PA	total and subscale scores (CFA)	two-factor orthogonal model best fir for data from older students while two-factor oblique best fit for data from younger students; evidence of increasing differentiation of symptoms with increased age
Chorpita, Plummer, & Moffitt (2000)	100 clinically referred youth ages 6-17	ADIS-IV, RCMAS, CDI, clinician severity rating	NA, PA, PH, DSM-IV anxiety or mood disorder Sx	conducted all analyses using rationally selected items replicating factors used in Joiner et al. (1996) and Chorpita et al. (1998) (CFA)	two higher-order factors with PH as second order factor, no model was parsimonious; when age was used as covariant, fit of models were approximately equivalent

(*table continues*)

Authors	Sample	Authors	Constructs assessed	Scale construction/ analysis	Results
Chorpita (2002)	282 3rd-4th grade students, 338 5th-6th grade students, 463 7th-8th grade students, 247 9th-10th grade students, 248 11th-12th graders	Spence Children's Anxiety Scale, 27 items from RCMAS and CDI	anxious Sx depressed Sx	total and subscale scores (CFA)	three-factor model provided best fit for all age samples; however, some differences in relation of tripartite model dimensions to depression and anxiety based on age
Lonigan, Phillips, & Hooe (2003)	270 students in 4th-11th grade, split at median age (12.9 years)	CDI, PANAS-X, RCMAS	anxious Sx, depressed Sx, NA, PA	total and subscale scores (CFA)	two-factor orthogonal model best fit data for both age groups, but age-related differences in self-reports suggest dimensions are less differentiated at younger ages
Ollendick, Seligman, Goza, Byrd, & Singh (2003)	135 4th grade students, 185 7th grade students, 190 10th grade students	CDI, RCMAS	anxious Sx depressed Sx	rationally assigned items to anxiety/depression or NA, PA, PH–PCA used to reduce number of items (CFA)	two-factor model including depression and anxiety best fit data for both groups; failed to support the tripartite model; increasing differentiation of depression and anxiety with increased age
Turner & Barrett (2003)	331 students ages 7-8 years, 631 students ages 10-11 years, 882 students 13-14 years	BHI, CASI, CDI, HSC, RCMAS	anxious Sx, depressed Sx	rationally assigned items using Chorpita et al. (2000) as model (CFA)	three-factor model of NA, PA, and PH fits data best at all ages; little or no evidence of increasing differentiation with increased age
Bushman (2004)	45 3rd grade students, 60 6th grade students	PANAS-C, PH-C, AFARS, CDI, STAIC	ANXIOUS Sx, depressed Sx	total and subscale scores (CFA)	Supported two-factor correlated and uncorrelated models; increased differentiation of NA and PA in order sample as compared to younger sample

(table continues)

Authors	Sample	Authors	Constructs assessed	Scale construction/ analysis	Results
Jacques & Mash (2004)	246 4th-5th grade students, 218 10th-11th grade students	PANAS-C, PH-C, AFARS, CDI, STAIC	anxious Sx, depressed Sx, NA, PA, PH	total and subscale scores, (ANOVA, correlations, CFA)	three-factor model best fit data, but age-related differences including age x gender interactions; some age-related findings were inconsistent with tripartite model
Lambert, McCreary, Joiner, Schmidt, & Ialong (2004)	467 students assessed in 6th and 9th grade	Baltimore HIF	anxious Sx, depressed Sx	rationally assigned items to NA, PA, PH (CFA)	three-factor model provides best fit to data for both age groups; structure is invariant across age groups

Note. Baltimore HIF: Baltimore How I Feel Inventory; BHI: Beck Hopelessness Inventory; CASI: Childhood Anxiety Sensitivity Index; CDI: Children's Depression Inventory; HSC: Hopelessness Scale for Children; MASC: Multidimensional Anxiety Scale for Children; PANAS-X: Positive and Negative Affect Schedule-Explanded Form; PNIA: Peer Nomination Index of Anxiety; PNID: Peer Nomination Index of Depression; RADS: Reynolds Adolescent Depression Scale; RCADS: Revised Child Anxiety and Depression Scale; RCDS: Reynolds Child Depression Scale; RCMAS: Revised Children's Manifest Anxiety Scale; TRIA: Teacher Report Index of Anxiety; TRID: Teacher Report Index of Depression.

grade/one-factor model x^2 = 8.45, *df* = 10, GFI = .99, AGFI = .97, IFI = 1.00, RMSEA = .000; sixth grade/two-factor model x^2 = 17.44, *df* = 10, GFI = .98, AGFI = .92, IFI = .99, RMSEA = .067). These findings provided preliminary support for the tripartite model as applied to older children, but suggested that a unitary model should be applied to younger children. The authors concluded that, for third-grade students, depression and anxiety factors may not be distinguishable. However, for sixth-grade students, depression and anxiety present with overlapping component constructs, but are distinguishable. Since that time, the findings have been mixed with approximately equal numbers of studies supporting the structure of affect as being variant and stable across age cohorts.

Of the five studies supporting the structure of affect as invariant across age groups, only one was limited to an examination of just NA and PA. Lonigan and colleagues (2003) explored the relation of positive and negative affectivity to anxiety and depression in a sample of 270 4th- through 11th-grade students, with the sample split at the median. As described in the section discussing studies that examined the structure of affect, Lonigan and his colleagues found a two-factor orthogonal model of NA and PA best fit the data for both age groups included in their sample.

Four other studies demonstrated support for an invariant three-factor model to explain the structure of affect in youth. Chorpita and colleagues (1998) identified a three-factor solution of NA (anxiety), PA (depression), and PH (fear) as the model of best fit for their sample of data from 216 clinically referred children and adolescents diagnosed with either an anxiety disorder alone or an anxiety disorder with a comorbid mood disorder. They divided their sample into two groups on the basis of age to form two groups: children aged 6 to 11 years, and adolescents aged 12 to 17 years (*n* = 80 and 136, respectively). Chorpita and colleagues evaluated the three-factor solution in a

multisample analysis across children and adolescents yielding a x^2_{diff} = 15.77, *df* = 10, GFI = .97, CFI = .98, RMSEA = .052, suggesting that the three-factor solution fits the data extremely well for both groups. Similarly, Lambert and colleagues (2004) identified that a three-factor model of NA, anhedonia, and PH, best fit the data from samples of African American sixth- and ninth-grade students living in an urban area after comparing it to one- and two-factor models. As a caveat, they explained that the pattern of factor correlations for their samples demonstrated greater overlap than had been reported in previous studies of the tripartite dimensions (NA and PH r = .71, p < .01; anhedonia and PH r = .72, *ns;* and anhedonia and NA r = .84, p < .01).

In a separate study, discussed previously in this literature review, Chorpita and colleagues (2000) studied 100 clinically referred children between the ages of 6 and 17 based on self-reports of depression and anxiety and clinical interview data and obtained good fit for two different models higher-order models of depression and anxiety, with neither providing a parsimonious explanation for the covariance among the *DSM-IV* (1994) diagnoses. They examined age effects and minimal differences were observed in parameter estimates with the exception of the path from NA to separation anxiety that increased from nonsignificant for children to significant for adolescents using both the Chorpita and Joiner scales. These findings suggest that the fit of the models is approximately equivalent across age groups.

Also supporting the invariance of the tripartite model across age groups is research by Turner and Barrett (2003), who employed a CFA to test whether youth of different ages similarly demonstrate the structure of affect. In a sample of nearly 1,850 youth from the third, sixth, and twelfth grades, they found support for the three-factor model of PA, NA, and PH. Factor variances and factor covariances were found to be group invariant (x^2_{diff}/df = 2.18, IFI = .96, CFI = .96, RMSEA = .026). These findings

support the conclusion that the symptoms of depression and anxiety do not demonstrate increasing differentiation as children age.

In contrast, six studies were identified that concluded as children progress from childhood to adolescence there are increased levels of differentiation in the structure of affect as described using the tripartite constructs. Studies conducted by Lonigan and colleagues(1999) and Bushman (2004) explored developmental changes in the structure of affect, but limited the focus of their research to the constructs of NA and PA and did not attempt to examine the construct of PH. They reached similar conclusions. A two-factor model of NA and PA best fit the data for each age sample and the constructs of NA and PA, based on self-report data, were more differentiated for older samples than for younger ones. Lonigan and colleagues (1999) conducted a study examining the structure of affect in two community samples, 152 fourth- and fifth-grade students, ages 9 to 11 years old, and 213 students ages 12 to 17 years old. They determined that a two-factor orthogonal model of PA and NA fit the data better than any of the other models for both children ages 9 to 11 and 12 to 17 (x^2 = 212.83, RCFI = .88, $p < .001$, and x^2 = 218.88, RCFI = .94, $p < .001$ for the two-factor othogonal model for younger and older children, respectively). Despite the models being largely invariant across age, the authors found that NA was strongly correlated with depressive and anxious symptoms for both older and younger children, but PA had a significantly stronger negative correlation with depressive symptoms for the older sample than they younger sample. Whereas children and younger adolescents were more likely to report more diffuse general distress (NA), adolescents endorsed items in a way more supportive of the tripartite factors (NA, PA).

Bushman (2004) examined NA, PA, and the developmental changes in the structure of affect in a sample that included 45 third-grade and 60 sixth-grade students.

The data he obtained from the PANAS-C indicated that a two-factor orthogonal and a two-factor oblique model both provided adequate fit to the data for both samples of youth. A significant finding was obtained in the two-factor oblique model where the correlation between NA and PA was statistically significant for third graders, while it was smaller and nonsignificant for the sixth-grade sample. This indicates that in younger children NA and PA are less distinct for each other than in older children. In contrast, an examination of the correlations between the PANAS-C subscales and the other measures of depression and anxiety behaved as predicted by the tripartite model, but not for the sixth-grade sample. For the older sample, NA was correlated with anxiety and depression as expected, but PA was approximately equally correlated with each of the measures of depression and anxiety. Even more confusing was finding that the correlation between PA and depression was stronger for the third-grade sample than for the sixth-grade one, suggesting that PA actually accounts for more variance in the third-grade sample than in the older sample, and that PA has less utility for older children than younger ones in differentiating between depression and anxiety, and that anxiety and depression are more differentiated in older children.

Ollendick and colleagues (2003) examined NA, PA, and PH as possible factors in explaining the structure of affect, but found support for a two-factor model examined students in Grades 4, 7, and 10. Through CFA they found that a two-factor model of anxiety and depression best fit the data for students at all grades as compared to a three-factor model of NA, PA, PH (at 10th grade, x^2 = 117.43, GFI = .91, AGFI = .86 and x^2 = 167.67, GFI = .86, AGFI = .76, for the two- and three-factor models, respectively). Despite the fact that the model of best fit was invariant across ages, they found evidence of increasing differentiation of symptoms with increased age. The correlation between

the factors was r = .87 for the 4th-grade sample, and r = .80 and r = .70 for the 7th- and 10th-grade samples, respectively.

Chorpita (2002) in contrast to his previous research, conducted a study with a large sample (n = 1,578) that demonstrated that while a three-factor model of NA, PA, and PH, provides the best fit for the data to explain the structure of affect across grade levels, the relation of some tripartite dimensions to depression and anxiety change with age. Chopita found that NA was positively related with all anxiety and depression scales and PA was negatively correlated with the depression scale. Furthermore, he found that the path from PA to depression was uniform across age. However, separation anxiety and PH were more highly correlated and generalized anxiety and PH were more weakly correlated for adolescents than for younger children, a finding that the author attributed to the lower discriminant validity of the SCAS in older children. After constraining individual parameters from NA, minor decreases in the relationship between NA and separation anxiety, panic, and generalized anxiety were observed with increasing age. In light of the previous research, Chorpita avoided interpreting the results as developmental changes in the structure of affect and instead suggested that it may be due to the use of self-report measures and shortcoming of the instruments utilized.

Jacques and Mash (2004) also demonstrated support for a three-factor model of NA, PA, and PH as the best fit for their data from samples of 4th- and 5th-grade students and 10th- and 11th-grade students. However, they found the three-factor model provided better fit for older samples than younger ones. Their findings indicated that NA accounts for a larger portion of the variance in depression for younger students than for older ones, while for older subjects NA and PH were both significantly related to anxiety. They also identified significant age and gender interactions for depression, anxiety, PA, NA, and PH.

Findings related to developmental changes in the tripartite model are mixed. Most studies have employed relatively wide-age bands of youth as their samples. A significant number of studies have looked at age-related or developmental changes in the tripartite structure of children and adolescents. Some have found that the structure of affect is invariant across for samples of various ages, while others have concluded that there are differences in differentiation of the constructs or in the relation among the constructs and symptoms across samples of different ages, while the general structure of affect is consistent. In light of this, any study that collapses data across a wide age range cohort, may obscure important age-related differences in the structure of affect. Further research is needed to clarify the impact of development related to the tripartite model.

Limitations of Previous Research and Controversies

There exist several limitations to the current literature examining the structure of anxiety and depression in adolescents. Despite the research that has already been conducted examining the structure of anxiety and depression, and the agreement that they are two distinct constructs, consensus has yet to be reached about whether depression and anxiety in adolescents is best distinguished on the basis of a two-factor or three-factor model. Approximately half of the studies examining the structure of affect in children and adolescents have found support for a three-factor model of NA, PA, and PH, while almost an equal number demonstrated support for a two-factor model of NA and PA. However, many of the studies that provide support for two-factor models examined only the role of NA and PA. The relative lack of empirical support for the construct of PH may be due to a real difference between the adult tripartite model and the structure of affect in children; however, it may also be a result of relatively weaker

measures of PH because the most commonly used assessment tools for depression and anxiety do not include many items to address PH or researchers relative lack of attention to the construct. Further research using a variety of self-report measures may help to further clarify whether the structure of affect in youth is best described using a two- or three-factor model.

In the previously discussed studies, the nature and size of the clinical samples has, in most cases, prohibited researchers from comparing the structure of affect across homogeneous diagnostic groups. Additionally, only three of those studies utilized inpatient psychiatric samples of children and adolescent. Further research using samples of inpatient psychiatric youth may help clarify the structure of affect in this group for whom accurate diagnosis is especially salient so that efficacious interventions can be implemented.

Furthermore, in all three of the inpatient studies, the sample included both children and adolescents and the results were presented based on data from the entire sample as opposed to more homogeneous age groups. This mirrors the literature related to the tripartite model in children in adolescents as a whole, with only 5 studies examining the structure of depression and anxiety in adolescents, without collapsing them with data from younger age groups. This may be problematic because the results of several previous studies suggest that anxiety and depression become more differentiated with increasing age. It is possible that by collapsing the data across age groups, some of the evidence of the model's utility in discriminating depression and anxiety in adolescence is weakened. Research examining the model in a large sample of inpatient adolescents would further help to clarify our understanding of the structure of depression and anxiety in that population.

Additionally, research examining the tripartite model has used a relatively narrow set of instruments to assess the constructs. Commonly used self-report measures, such as the CDI and RCMAS, remain the most frequently employed measures for assessing the factors associated with the tripartite model. Newer instruments such as the PANAS-C and AFARS have been developed and used for assessing NA, PA, and PH. However, research has yet to examine some of the currently available instruments designed to assess clinical symptoms of depression and anxiety such as the Millon Adolescent Clinical Inventory (MACI). Identification of instruments that can contribute to our being able to better distinguish depression from anxiety and thereby select appropriate interventions is important both theoretically and clinically.

Research Questions

The present study will examine the relationship between NA, PA, and PH in a sample of psychiatrically hospitalized adolescents between the ages of 13 and 17. Diagnostic information for each of the subjects was provided prior to discharge. Data obtained using self-report measures designed to assess depressive and anxious symptomatology, as well as a measure of adolescent psychopathology, will be used to assess NA, PA, and PH. A rationally selected item approach, like the ones employed by Lonigan and colleagues (1996) and Chorpita and colleagues (1998), will be used to assign individual items from the RADS, RCMAS, and the MACI to the constructs of NA, PA, and PH. Structural equation modeling will be used to identify and describe the model of best fit.

The following questions were addressed using data from the RCMAS and the RADS:

1. Does a three-factor model including NA, PA, and PH provide a better fit for the data obtained from a sample of inpatient adolescents than a two-factor model including NA and PA?

2. Is the model of best fit invariant across groups of adolescents with depressive and anxious diagnoses? If not, what model provides the best ft for the depressive and anxious diagnostic groups?

Then, the following questions will be addressed using data from the RCMAS, RADS and MACI:

3. Does a three-factor model including NA, PA, and PH provide a better fit for the data obtained from a sample of inpatient adolescents than a two-factor model including NA and PA?

4. Is the model of best fit invariant across groups of adolescents with depressive and anxious diagnoses? If not, what model provides the best ft for the depressive and anxious diagnostic groups?

5. Are the patterns of scores on NA, PA, and PH for the various diagnostic groups (depression only, anxiety only, and comorbid depression and anxiety) consistent with what would be expected based on the tripartite model?

CHAPTER III

METHODS

Participants

Participants for the current study were drawn from an extant data set of over 1,400 children and adolescents who were admitted for inpatient psychiatric treatment at an academic medical center in the Midwest during the period spanning 1990 to 2003. The academic medical center accepts patients from a large cachement area that includes urban, suburban, and rural communities. Consent for participation was obtained from the guardians of youth included in the extant data set at the time of their hospital admission, as part of the intake process.

Participants were excluded from the current study if: (A) their age fell outside the range of 13 to 18 years; (b) they were diagnosed as having a psychotic-spectrum disorder, a pervasive developmental disorder, or mental retardation, prior to or during their hospitalization; (c) they did not have a clinical diagnosis, because it could not be determined whether they had been diagnosed with one of the excluded diagnoses; and (d) they failed to complete a total of three or more items across the RADS, RCMAS, or MACI. Of the original sample, 925 participants were identified as being between the ages of 13 and 18 years. Of those, only 849 had completed at least the RADS and RCMAS. Another 33 potential participants had psychotic-spectrum, pervasive developmental, or mental retardation diagnoses and were excluded from participation; while 51 potential participants had no diagnoses, which reduced the potential sample size to 765. Of those 765 adolescents, 83 failed to complete a total of three or more items across the measures, leading to their exclusion and leaving the final sample of

682 adolescents who completed at least the RADS and RCMAS, with two or fewer missing items. These participants comprised the initial sample for the study. Data collection spanned almost 13 years and new measures were introduced during that time. The MAPI was initially administered during the earlier stages of data collection. However, in 1994, the MACI began to be used. Given the research questions of interest, data for both measures count not be used and the MACI was selected. For that reason fewer participants completed the MACI than did the RADS and RCMAS (n = 291 for the MACI, RADS, and RCMAS and n = 682 for the RADS and RCMAS).

Subjects for the study ranged in age from 13 to 18 years (mean age = 15.02 years, SD = 1.32). The sample was 59.7% female, and self-identified as Caucasian (80.6%). Just over half the sample was referred for hospital admission by their parents (52.5%) and 29.3% reported a history of previous psychiatric hospitalizations. At the time of admission, a variety of demographic data were collected. Demographic variables are presented in Table 6. Although medication status is not reported for the participants, it was assumed that most were receiving at least one psychopharmacological agent upon their discharge from the hospital.

Measures

Reynolds Adolescent Depression Scale

The Reynolds Adolescent Depression Scale (RADS; Reynolds, 1986) is a self-report measure designed to assess depressive symptomatology in youth ages 13 to 18, designed as a screening instrument for use in schools. It is comprised of 30 items, including 7 reversed-scored items, for which the adolescent is asked to use a 4-point rating scale ranging from 1 "almost never" to 4 "most of the time" to describe how they

Table 6

Demographic Variables for the Sample

Demographic variables	Total sample (N = 682)[a]	
	N	Valid % of sample
Age (in years)		
13	107	15.7
14	149	21.8
15	164	24.0
16	151	22.1
17	107	15.7
18	4	.6
Gender		
Male	275	40.3
Female	407	59.7
Ethnicity		
Caucasian	547	80.6
African-American	70	10.3
Hispanic	30	4.4
Biracial	22	3.2
Native American	3	0.4
Other (self-identified)	7	1.0
Admission source		
Parents	353	52.5
Hospital (ER or medical unit)	165	24.5
Other (psychiatrist, psychologist, police)	58	8.6
Juvenile Detention	41	6.1
Foster care	19	2.8
Group home/residential treatment facility)	19	2.8
Relatives (nonparent)	18	2.7
Past psychiatric hospitalizations		
No	467	70.7
Yes	194	29.3
Socioeconomic status (based on Hollingshead Four Factor Model)[b]		
Low	107	27.4
Lower-middle	126	32.3
Middle	80	20.5
Upper-middle	58	14.9
Upper	19	4.9
Special education status		
None	511	75.8
Learning disability	52	7.7
Emotional disability/severe behavior disability	49	7.3
Other[c]	62	9.2

[a]Not all demographic variables were available for all students. [b]The four factors include education, occupation, gender, and marital status (of guardians). [c]These include the other eligibility categories established under IDEA.

usually feel in respect to the statement. Scores are calculated by summing across scores and can range from 30 to 120, with a score of 77 or higher suggestive of clinical depression. Percentile rank scores associated with total raw scores can also be calculated for respondents based on their age and gender. The RADS is reported to have moderate- to high-convergent validity with other self-report and clinical measures of depression. Reynolds reported that Pearson product-moment correlations between the RADS and the Beck Depression Inventory-Adolescent (BDI-IA) ranged from .70 to .76 across 10 studies. The author reported excellent internal consistency with alpha coefficients that range from .92 to .96, and test-retest reliability has been estimated as .79 for a 3-month interval.

Revised Children's Manifest Anxiety Scale

The Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985) is a self-report measure designed to assess the level and nature of trait anxiety in children and adolescents, 6 to 18 years of age. It is comprised of 37 yes/no (true/false) items, 28 of which are designed to assess anxiety and the remaining 9 assess social desirability. The anxiety items address physiological, cognitive, and behavioral manifestations of anxiety, while the social desirability items consist of statements that are almost never true, but are socially desirable. Scores are obtained by summing the number of "yes" responses to the 28 content items designed to assess anxiety, and can range from 0 to 28, with higher scores being associated with greater anxiety. The RCMAS also yields 3 subscale scores in addition to the lie/social desirability score: physiological anxiety (10 items), worry and oversensitivity (11 items), and social concerns/concentration (7 items). The total and four scale scores can be converted to *t* scores based on norms for age, gender, and race. Percentile ranks can also be

reported. For the purposes of the present project, items contributing to the lie/social desirability were not be used. Reynolds and Richmond reported internal consistency for the total score of .83 and internal consistency for the subscale scores that range from .42 to .87 (1985). They also report good validity (r = .85 with the State-Trait Anxiety Scale for Children). Test-retest reliability coefficients range from .98 at 3 weeks to .68 for 9 months (Reynolds & Richmond).

Millon Adolescent Clinical Inventory

The MACI (Millon, Millon, & Davis, 1993) is a self-report inventory designed for assessing personality characteristics and clinical syndromes in adolescents, ages 13 to 19. It consists of 160 true/false items, that are used to generate 31 scale scores including 12 personality patterns (introversive, inhibited, doleful, submissive, dramatizing, egotistic, unruly, forceful, conforming, oppositional, self-demeaning, and borderline tendency), eight expressed concerns (identity diffusion, self-devaluation, body disapproval, sexual discomfort, peer insecurity, social insensitivity, family discord, and childhood abuse), seven clinical syndromes (eating dysfunctions, substance abuse proneness, delinquent predisposition, impulsive propensity, anxious feelings, depressive affect, and suicidal tendency), three modifying indices (disclosure, desirability, and debasement), and a reliability score. The MACI yields raw scores for each of the 31 scales that are then transformed to base rate scores based on the age and gender of the respondent. The test authors report acceptable internal consistency with alpha coefficients that range from 0.73 to 0.91. The test-retest reliability at 3 to 7 days ranged from 0.57 to 0.92, with a median stability coefficient of 0.82.

Although the MACI scale scores were not utilized in this study, selected items were utilized to assess the constructs of NA, PA, and PH. Each item endorsed as being

"true" by the respondent was scored as one, while those endorsed as "false" or not true of them were scored as a zero. True responses associated with each construct were summed along with items from the RADS and RCMAS contributing to NA, PA, and PH to yield a total construct score, as described later in this chapter.

Clinical Diagnosis

Chart diagnoses were recorded for each subject at discharge. The diagnoses for each participant were provided by consensus of a multidisciplinary team consisting of a psychiatrist, psychiatry residents, psychologists, social workers, psychiatric nurses, special education teachers, occupational therapists, and recreational therapists, based on detailed information from multiple sources, including structured and/or semistructured interviews conducted by the psychiatrist or the psychiatry resident with supervision from the psychiatrist. While participants in the multidisciplinary team might have varied over the data collection period, the same two attending psychiatrists and supervising psychologist were involved with all patients admitted for psychiatric hospitalization and included in the extant data set. In all cases, the attending psychiatrist ultimately made the discharge diagnosis. Diagnoses were provided based on *DSM-III-R* (1993) diagnostic criteria until 1993, after which the *DSM-IV* (1994) diagnostic criteria were used. Of the 682 subjects, 91 had *DSM-III R* diagnoses, and 591 subjects had *DSM-IV* diagnoses. The majority of subjects in the sample (62.8%) had at least two Axis I diagnoses. To facilitate examination of research questions related to diagnostic category, participants were assigned to one of four categories based on diagnosis. The categories included: (A) participants diagnosed as having a depressive disorder or depressive disorder and another disorder other than an anxiety disorder, (b) participants diagnosed with an anxiety disorder or an anxiety disorder and another nondepressive

diagnosis, (c) participants diagnosed with both a depressive and an anxiety disorder (comorbid depression and anxiety), and (d) participants diagnosed with disorders that are neither depressive or anxiety disorders. Participants with bipolar disorder, most recent episode depressed were categorized as having a depressive disorder (because the acute symptomatology was most similar to those associated with depressive diagnoses), while subjects with other bipolar diagnoses were included in the "other" category. All other diagnoses, including disruptive behavior disorders and substance use and abuse disorders were included in the "other" category as well. The frequencies for each diagnostic category, as well as the frequencies for specific diagnoses included within the sample, are provided in Table 7. Most participants had multiple DSM diagnoses, and for that reason the frequencies for the specific disorders exceed 100%.

Procedure

Procedures for this study were approved by the Institutional Review Board (IRB) at the Medical University of Ohio at Toledo (then the Medical College of Ohio) beginning in 1993, and were reviewed annually. Use of the extant data for the purposes of this dissertation was approved in August 2005 by the IRB at the Medical University of Ohio and in June 2006 by the Utah State University IRB. Data were collected from each of the participants within 7 days of admission as part of their routine psychological evaluation. They received no reimbursement for participation. All of the data included were obtained as part of the course of treatment. Demographic information, psychosocial and medical history, clinical interview, and a variety of self- and parent-report measures were provided by participants. Most participants completed the self-report measures independently; however, participants with poor reading skills were

Table 7

Frequency of Diagnostic Categories for the Sample

Demographic variable	Total sample (N = 682)	
	n	Valid % of sample
Depressive disorder	448	65.7
Anxiety disorder only	27	4.0
Comorbid anxiety and depression	89	13.0
Other disorders[a]	118	17.3
Adjustment disorders		
Adjustment Disorder with Depressed Mood	22	3.2
Adjustment Disorder with Mixed Anxiety and Depression	5	0.7
Adjustment Disorder with Mixed Disturbance of Emotions and Conduct	7	1.0
Adjustment Disorder NOS	3	0.4
Anxiety disorders		
Agoraphobia without a History of Panic Disorder	1	.02
Anxiety Disorder NOS	8	1.2
Generalized Anxiety Disorder	9	1.3
Obsessive-Compulsive Disorder	20	2.9
Panic Disorder with Agoraphobia	1	0.2
Panic Disorder without Agoraphobia	6	0.9
Post-Traumatic Stress Disorder	86	12.6
Social Phobia	1	0.2
Disorders usually first diagnosed in Infancy, Childhood, or Adolescence		
Attention-Deficit Hyperactivity Disorder	126	18.5
Conduct Disorder	54	7.9
Disruptive Behavior Disorder NOS	22	3.2
Enuresis	7	1.0
Learning Disorder NOS	10	1.5
Math Disorder	1	0.2
Oppositional Defiant Disorder	98	14.4
Overanxious Disorder	4	0.6
Pica	1	0.2
Reactive Attachment Disorder	1	0.2
Separation Anxiety Disorder	7	1.0
Tourette's Disorders	5	0.7
Eating Disorders		
Anorexia Nervosa	5	0.7
Bulimia Nervosa	8	1.2
Eating Disorder NOS	15	2.2
Impulse-control disorders not elsewhere classified		
Impulse-Control Disorder NOS	1	0.2
Intermittent Explosive Disorder	5	0.7
Trichotillomania	2	0.3

(*table continues*)

Demographic variable	Total sample (N = 682)	
	n	Valid % of sample
Mood disorders		
Bipolar I Disorder, Most Recent Episode Depressed	6	0.9
Bipolar I Disorder, Most Recent Episode Hypomanic	3	0.4
Bipolar I Disorder, Most Recent Episode Manic	3	0.4
Bipolar I Disorder, Most Recent Episode Mixed	12	1.8
Bipolar I Disorder, Most Recent Episode Unspecified	16	2.3
Bipolar II Disorder	27	4.0
Cyclothymic Disorder	14	2.1
Depressive Disorder NOS	13	1.9
Dysthymic Disorder	265	38.9
Major Depressive Disorder, Recurrent	31	4.6
Major Depressive Disorder, Single Episode	402	58.9
Major Disorder Due to a Medical Condition	1	0.2
Personality Disorders		
Antisocial Personality Disorder	6	0.9
Avoidant Personality Disorder	1	0.2
Borderline Personality Disorder	9	1.3
Compulsive Personality Disorder	2	0.3
Dependent Personality Disorder	6	0.9
Histrionic Personality Disorder	6	0.9
Narcissistic Personality Disorder	2	0.3
Neurotic Personality Disorder	3	0.4
Passive-Aggressive Personality Disorder	1	0.2
Unspecified Personality Disorder	4	0.6
Somatoform Disorders		
Body Dysmorphic Disorder	1	0.2
Substance Related Disorders		
Alcohol abuse	47	6.9
Alcohol dependence	2	0.3
Alcohol intoxication	1	0.2
Caffeine intoxication	1	0.2
Cannabis abuse	25	3.7
Cannabis dependence	1	0.2
Inhalant abuse	12	1.8
Other substance dependence	1	0.2
Nicotine dependence	2	0.2
Unspecified drug abuse	15	2.3
Other disorders		
Amnestic Disorder NOS	2	0.3

[a]Includes disruptive behavior disorders, substance use/abuse disorders, bipolar disorder (most recent episode mixed, manic, or unspecified), impulse control disorders, eating disorders, other disorders evidenced in childhood and infancy.

administered the self-report measures orally by either a psychology intern or a member of the nursing staff. Semistructured clinical interviews with the adolescent and his or her parent(s) or guardian(s) by the psychiatry staff occurred within one to three days of admission, and self-report measures were completed within four days of admission.

Data were entered into the data set by the principal investigator for the study or by one of several psychology interns completing predoctoral psychology internships at the site. The data were collected between 1990 and 2003 and were supplemented by a review of the charts several years after initial data collection concluded. The data set did not include identifying information for the participants.

NA, PA, and PH Construct Scale Construction

Scales were developed to assess the dimensions of NA, PA, and PH using a rationally selected item approach first employed by Joiner and colleagues (1996). To accomplish this, an item-rating packet (see Appendix A) was distributed to a pool of 17 psychologists and advanced psychology graduate students. The packet contained definitions of NA, PA, and PH; a rating form containing all the items from the MACI, RADS and RCMAS (with the lie/social desirability scale items omitted); and instructions for rating the items. Respondents were asked to rate each item as assessing only NA, only PA, only PH, or other. They were instructed to use the other category if they believed the item assessed more than one construct or none of the constructs of interest. Twelve individuals returned the item rating packets (58.3% psychologists, 41.7% graduate students) for an overall return rate of 70.6%. The item ratings were entered into a SPSS database and analyzed to identify items meeting a minimum of 80% inter-rater agreement. Item ratings for every item considered for inclusion are provided in Appendix B. Based on the item ratings, 60 items were identified as

assessing NA (34 from the MACI, 11 from the RCMAS, and 10 from the RADS), 11 as assessing PA (5 from the MACI and 6 from the RADS), and 10 as assessing PH (2 from the MACI, 5 from the RCMAS, and 3 from the RADS).

The items selected for inclusion in the NA, PA, and PH scales were very similar to those included in two previous studies employing the rationally selected item approach (Chorpita et al., 1998; Joiner et al., 1996). The five items not identified as assessing NA, PA, or PH in this study, but included in the scales from the other studies, came from the RCMAS (items 1, 7, 14, 21, and 34). With the exception of item 34 "I am nervous" that was included as an NA item in both Joiner's and Chorpita's studies, the other items were selected by only one set of authors as assessing either NA or PH. Joiner and his colleagues assigned "I am afraid of a lot of things," and "I worry about what other people think about me," to NA. Chorpita and his colleagues assigned "I have trouble making up my mind" to NA and "I am tired a lot," to PH. In the current study, some item raters indicated these items measured NA, while others indicated they measured PH, while still others did not feel the items were unique to a single construct. For example, in rating the item "I am nervous," 58.3% of the raters indicated the item measures NA, while 25.0% indicated it assessed PH, and 16.7% did not feel like it was unique to any of the dimensions of interest.

Two sets of construct scores were generated: one set was calculated using items from the RADS and RCMAS, while the other was calculated based on selected items from the MACI, RADS, and RCMAS. For each set of constructs, scores for NA, PA, and PH were calculated by summing across the items within each scale. If a subject responded to an item as being true of them (a "True" response on the MACI, a "Yes" response on the RCMAS, or a "Most of the time" or "Sometimes " on the RADS), a score of 1 point was given to that item. Responses that indicated that the item was not true of

them were scored a zero ("False," "No," "Hardly ever," "Almost never.") Therefore, when calculating construct scores based on selected items from the MACI, RADS, and RCMAS, NA scores could range from 0 to 60, while PA scores ranged from 0 to 11, and PH scores ranged from 0 to 10. Construct scores calculated based on selected items from the RADS and RCMAS range from 0 to 26 for NA, from 0 to 6 for PA, and from 0 to 8 for PH.

CHAPTER IV

RESULTS

This section begins with a discussion of how missing data was handled followed by descriptive statistics related to the measures of interest and created construct scales. Next, the procedure for assigning individual items to item parcels is described. Then analyses addressing each of the 5 research questions and the subsequent results are presented.

Missing Data

The sample of 682 adolescents is a subsample of the approximately 1,400 adolescents from whom data was collected who completed the instruments of interest and met the inclusion criteria for the current study. Of these participants, a number failed to complete every item on every scale. Twenty-six cases included a single missing item and an additional 51 subjects failed to complete 2 items. Missing values for each item were imputed using PRELIS. Using this method, the missing value is obtained from another case that has a similar pattern of responses over a set of matching variables (Joreskog & Sorbom, 1996-2002).

Descriptive Statistics

Means, standard deviations, skewness, and kurtosis for each of the subscales and total scores for the RADS and RCMAS, and the scores for the construct scales of NA, PA, and PH are presented in Table 8. The mean total score obtained on the RADS was 76.23 with a standard deviation of 16.86. This score is significantly greater than the mean score of 60.18 (*SD* = 14.29) reported from the standardization sample and

Table 8

Descriptive Statistics (Means, Standard Deviations, Skewness, and Kurtosis) for Measures Related Subscales and Constructs

	Total sample (*N* = 682)					
Measure/subscale	Range	Mean	*SD*	Skewness	Kurtosis	α
Reynolds Adolescent Depression Scale						
RADS total score	30.0-115.0	76.23	16.86	-.452	-.415	.910
Revised Children's Manifest Anxiety Scale						
Physiological anxiety	0.0-10.0	4.37	2.67	.184	-.891	.749
Worry and oversensitivity	0.0-11.0	5.79	3.55	-.117	-1.258	.871
Social concerns/concentration	0.0-7.0	3.65	2.21	-.049	-1.146	.769
RCMAS total score	0.0-28.0	13.80	7.46	-.024	-1.055	.914
Tripartite construct scores (RADS and RCMAS items)						
NA	2.0-60.0	32.57	15.84	-.249	-1.177	.916
PA	0.0-11.0	4.75	2.01	.864	1.334	.838
PH	0.0-10.0	4.22	2.57	.080	-.994	.751
Tripartite construct scores (MACI, RADS, and RCMAS items, *N* - 291)						
NA	0.0-26.0	15.01	7.13	-.305	-1.087	.960
PA	0.0-6.0	3.29	2.22	-.218	-1.432	.476
PH	0.0-8.0	3.44	2.35	.178	-1.037	.723

approximates the clinical cutoff of 77 reported in the RADS manual (Reynolds, 1986). The mean RCMAS total score obtained from this research sample was 13.81 (*sd* = 7.46), which is comparable to the normative sample in regards to mean score (13.84); however the standard deviation was noticeably greater than that of the normative sample (5.79). Using the construct scales based on MACI, RADS, and RCMAS items, the alpha coefficient was low (.48) for PA, while it was moderate for PH (.72) and high for NA (.96). When using scales constructed from items selected from the RADS and RCMAS, the alpha coefficients for the NA, PA, and PH construct scales were moderate to high at 84, .92, and .75, respectively.

Item Parcels

An item parcel is an observed variable or indicator that is either a simple sum or a mean of several items that are assumed to be unidimensional, conceptually similar, and that are used to assess the same construct (Hagtvet & Solhaug, 2005). The use of item parcels provides two potential benefits over the use of individual items in structural equation modeling (SEM). First, using individual items creates situations in which a large number of indicators may be associated with a latent variable. As the number of indicators increases, so does the potential for cross-loading among the indicators due to shared secondary influences that may decrease the values of the commonly used fit indices (Hall, Snell, & Foust, 1999). Assigning the individual items to item parcels comprised of similar items has the benefit of reducing a large number of observable variables to a lesser number of indicators that are then used to predict the various latent factors. Second, individual item scores (especially dichotomously coded variables such as the individual items from the RCMAS and MACI) tend to be nonnormally distributed and therefore the data violates some of the assumptions associated with SEM.

Combining variables into item parcels creates scores for each of the indicators that are more likely to yield multivariate normal data and therefore result in positive-definite matrices that are necessary for SEM.

Various strategies have been employed for assigning items to item parcels. These include assigning items based on content similarity, internal consistency, factor loadings from an exploratory factor analysis or a confirmatory factor analysis, or random combinations (Hagtvet & Solhaug, 2005; Hall et al., 1999; Nasser & Wisenbaker, 2003). Studies have concluded that structural equation modeling results are largely equivalent regardless of how the parcels are constructed if the parcels are unidimensional and do not manifest shared secondary influences (Hall et al.; Schallow, 2000).

For the purpose of this research, two sets of item parcels were generated using a statistical approach and another two sets of item parcels were generated using a content-based approach. Item parcels comprised of between two and five items were generated using the items from the RADS and RCMAS, and from items from the MACI, RADS, and RCMAS. In the statistical approach to creating item parcels, items with the strongest correlations within each construct of interest were grouped together. Statistical assignment of the items from the RADS and RCMAS resulted in eight parcels assessing NA, and 3 each for PA and PH. The larger pool of items selected from the MACI, RADS, and RCMAS, yielded 17 NA parcels, 3 PA item parcels, and 4 PH item parcels using the statistical approach. Tables 9 and 10 illustrate the assignment of the items to parcels for both the RADS and RCMAS and the MACI, RADS, and RCMAS item pools using the statistical approach, as well as the Cronbach alphas associated with each item parcel. Overall, the alpha coefficients were somewhat higher for the parcels generated from the RADS and RCMAS items, than for the parcels generated from the MACI, RADS, and RCMAS. For example, alpha coefficients ranged from

Table 9

Statistically Assigned Item Parcels of RADS and RCMAS Items

Parcel	Item	Source	α
NA 1	I worry a lot of the time	RCMAS 6	.77
	I worry when I go to bed at night	RCMAS 30	
	I feel worried	RADS 26	
NA 2	I get mad easily	RCMAS 9	.74
	I feel I am bad	RADS 19	
	I feel I am no good	RADS 20	
	I feel mad about things	RADS 22	
	I feel like nothing I do helps any more	RADS 30	
NA 3	I feel lonely	RADS 3	.70
	I feel like hiding from people	RADS 6	
	I feel sad	RADS 7	
	I feel sorry for myself	RADS 21	
NA 4	I feel like crying	RADS 8	.49
	I feel that no one cares about me	RADS 9	
	I feel upset	RADS 16	
	I feel that life is unfair	RADS 17	
NA 5	I feel that others do not like the way I do things	RCMAS 11	.60
	Other people are happier than I	RCMAS 23	
	I feel that other students don't like me	RADS 15	
NA 6	I feel alone even when there are other people with me	RCMAS 15	.74
	My feelings get hurt easily	RCMAS 18	
	My feelings get hurt easily when I am fussed at	RCMAS 26	
	I often worry about something bad happening to me	RCMAS 37	
NA 7	I worry about what my parents will say to me	RCMAS 10	.52
	I worry about what is going to happen	RCMAS 22	
	I worry about school	RADS 2	
PA 1	I feel like having fun with other students	RADS 10	.82
	I feel like having fun	RADS 25	
PA 2	I feel important	RADS 5	.66
	I feel loved	RADS 12	
PA 3	I feel happy	RADS 1	.60
	I feel like talking to other students	RADS 23	
PH 1	It is hard for me to get to sleep at night	RCMAS 13	.67
	I wiggle in my seat a lot	RCMAS 33	
	I have trouble sleeping	RADS 24	
PH 2	Often I feel sick in my stomach	RCMAS 17	.76
	I feel sick	RADS 11	
	I get stomachaches	RADS 27	
PH 3	Often I have trouble getting my breath	RCMAS 5	.38
	My hands feel sweaty	RCMAS19	

Table 10

Statistically Assigned Item Parcels of MACI, RADS, and RCMAS Items

Parcel	Item	Source	α
NA 1	I hate the fact that I don't have the looks or brains I wish I had	MACI 26	.84
	Most people are better looking than I am	MACI 31	
	I sometimes feel very unhappy with who I am	MACI 84	
	I don't think people see me as an attractive person	MACI 99	
	There are times I wish I were someone else	MACI 127	
NA 2	I think everyone would be better off if I were dead	MACI 16	.85
	I sometimes get so upset that I want to hurt myself seriously	MACI 54	
	More and more often I have thought of ending my life	MACI 107	
	I've given though to how and when I might commit suicide	MACI 156	
NA 3	I often feel sad and unloved	MACI 64	.77
	I feel lonely and empty most of the time	MACI 153	
	There are times when nobody at home seems to care about me	MACI 158	
	I feel lonely	RADS 3	
NA 4	I worry a lot of the time	RCMAS 6	.77
	I worry when I go to bed at night	RCMAS 30	
	I feel worried	RADS 26	
NA 5	Lately, little things seem to depress me	MACI 125	.71
	I feel pretty aimless and don't know where I'm going	MACI 154	
	I feel like crying	RADS 8	
NA 6	My feelings get hurt easily	RCMAS 18	.58
	My feelings get hurt easily when I am fussed at	RCMAS 26	
	I worry about school	RADS 2	
NA 7	I feel that no one cares about me	RADS 9	.70
	I feel like nothing I do helps any more	RADS 30	
NA 8	I guess I'm a complainer who expects the worst to happen	MACI 19	.78
	Things in my life just go from bad to worse	MACI 43	
	Good things don't last	MACI 110	
	My future seems hopeless	MACI 147	
NA 9	I probably deserve many of the problems I have	MACI 16	.65
	I often deserve it when others put me down	MACI 66	
	No one really care if I live or dies	MACI 97	
NA 10	I feel alone even when there are people with me	RCMAS 15	.68
	I worry about what is going to happen	RCMAS 22	
	I often worry about something bad happening to me	RCMAS 37	
NA 11	Other people are happier than I am	RCMAS 23	.74
	I feel like hiding from people	RADS 6	
	I feel sad	RADS 7	
	I feel that life is unfair	RADS 17	
	I feel mad about things	RADS 22	
NA 12	It is not unusual to feel lonely and unwanted	MACI 20	.73
	I often feel I'm not worthy of the nice things in my life	MACI 80	
	I make my life worse than it has to be	MACI 121	
	I don't like being the person I've become	MACI 140	
	I seem to make a mess of the good things that come my way	MACI 141	
NA 13	I worry a great deal about being left alone	MACI 63	.54
	I rarely look forward to anything with much pleasures	MACI 91	
	I get frightened when I think of being all alone in the world	MACI 109	
NA 14	Most other teenagers don't seem to like me	MACI 35	.67
	I often feel lousy after something good has happened to me	MACI 98	
	Although I want to have friends, I have almost none	MACI 142	

(*table continues*)

Parcel	Item	Source	α
NA 15	So little of what I have done has been appreciated by others	MACI 25	.38
	I spend a lot of time worrying about my future	MACI 79	
	I feel upset	RADS 16	
NA 16	I worry about what my parents will say to me	RCMAS 10	.63
	I feel that others do not like the way I do things	RCMAS 11	
	I feel that other students don't like me	RADS 15	
	I feel sorry for myself	RADS 21	
NA 17	I get mad easily	RCMAS 9	.66
	I feel I am bad	RADS 19	
	I feel I am no good	RADS 20	
PA 1	I feel happy	RADS 1	.77
	I feel like having fun with other students	RADS 10	
	I feel like talking to other students	RADS 23	
	I feel like having fun	RADS 25	
PA 2	I feel important	RADS 5	.69
	I feel loved	RADS 12	
PA 3	I like the way I look	MACI 10	.54
	I seem to get in right away with any group of new kids I meet	MACI 24	
	I make friends easily	MACI 70	
	Almost anything I try comes easy to me	MACI 101	
	I'm very mature for my age and know what I want do do in life	MACI 145	
PH 1	It is hard for me to get to sleep at night	RCMAS 13	.68
	I wiggle in my seat a lot	RCMAS 33	
	I have trouble sleeping	RADS 24	
PH 2	Often I feel sick in my stomach	RCMAS 17	.78
	I feel sick	RADS 11	
	I get stomachaches	RADS 27	
PH 3	Often I have trouble getting my breath	RCMAS 5	.27
	My hands feel sweaty	RCMAS 19	
PH 4	Sometimes when I'm away from home, I begin to feel tense and panicky	MACI 17	.41
	I often fear I'm going to panic or faint when I'm in a crowd	MACI 32	

.60 to .82 for PA parcels generated from the RADS and RCMAS, while they ranged from .52 to .77 for the PA parcels generated from items from the MACI, RADS, and RCMAS. For NA, alpha coefficients ranged from .38 to .85 and from .27 to .78 for PH.

Using a content-based approach, items were grouped into parcels based on semantic or definitional similarities (i.e., items related to suicidality or items assessing anhedonia). Content-based item assignment of selected items from the RADS and RCMAS resulted in 7 NA parcels, 3 PA parcels, and 3 PH parcels. Using the larger pool of items selected from the MACI, RADS, and RCMAS resulted in 15 NA parcels, 3 PA parcels and 4 PH parcels. The internal consistency reliability coefficients for the statistically generated item parcels were higher than those for the content-based item parcels. Consequently, the statistically generated item parcels were used to answer the research questions addressed in the current study. For comparison purposes, tables are included in Appendixes C and D for the item parcels generated using the content-based approach.

Research Question #1

The first research question asked whether a three-factor model including NA, PA, and PH provides a better fit for the data obtained from a sample of inpatient adolescents than a two-factor model including NA and PA, based on items obtained from the RADS and RCMAS. It was hypothesized that the three-factor model would provide the better fit, consistent with the tripartite model. Confirmatory factor analysis was used to test the two- and three-factor model using the item parcels generated from the RADS and RCMAS items.

Item parcel means, standard deviations, skewness, and kurtosis for the statistically generated parcels of RADS and RCMAS items are provided in Table 11.

Table 11

Means, Standard Deviations, Skewness, and Kurtosis for the Statistically Generated Item Parcels from the RADS and RCMAS Items

Item parcel	Mean	Standard deviation	Skewness	Kurtosis
NA 1	1.60	1.22	-.123	-1.57
NA 2	3.11	1.66	-.432	-1.06
NA 3	2.28	1.38	-.358	-1.11
NA 4	2.48	1.19	-.480	-.68
NA 5	1.62	1.10	-.104	-1.33
NA 6	2.09	1.49	-.127	-1.39
NA 7	1.89	1.03	-.453	1.00
PA 1	1.12	.92	-.236	-1.77
PA 2	1.06	.86	-.109	-1.65
PA 3	1.08	.84	-.148	-1.58
PH 1	1.54	1.16	-.070	-1.45
PH 2	1.36	1.23	.188	-1.56
PH 3	.5	.71	.804	-.65

The NA and PA parcels were negatively skewed ranging from -.48 to -.10, while the PH parcels were nearly normally distributed (-.07) or positively skewed (.19 and .80).

Data were analyzed using AMOS 6.0 (analysis of moment structures) maximum likelihood (ML) estimation. In each case, the covariance matrix was analyzed and error terms of the observed variables were not allowed to correlate. For both the two-factor and three-factor models, the latent factors were free to correlate and be estimated during analysis. The AMOS default settings were used to assign a metric by constraining a single observed factor loading to one for each latent variable.

Description of Fit Indices

A wide variety of fit indices can be used to assess the fit of models to data. For the present study the fit indices that will be used follow the recommendations of Nasser and Wisenbaker (2003) and Byrne (2005) and include the use of the overall chi-square

value (x^2), degrees of freedom (*df*), the comparative fit index (CFI), the non-normed fit index (NNFI), the standardized root means residual (SRMR), and the root mean square error of approximation (RMSEA) with its corresponding 90% confidence interval.

The chi square statistic was one of the first indices developed and is reported for almost all CFAs. It is a measure of general model fit, and is viewed as an estimation of how much the implied covariances (based on theory) differ from the sample covariances (derived from the data). It is evaluated in relation to the degrees of freedom. Schumacker and Lomax (2004) explain that a significant chi-square value indicates that the observed and estimated variance-covariance matrices are different. A nonsignificant chi-square value suggests that the two matrices are similar and the hypothesized model reasonably reproduces the variance-covariance matrix from the data. The chi-square statistic is sensitive to both sample size and deviations from statistical normality, meaning that large samples and significantly skewed data almost always yield statistically significant findings. With a sample of more than 200, a significant chi-square value is highly probable.

The root mean square residual (RMSR) represents the average residual value obtained by fitting the variance-covariance matrix for the hypothesized model to the variance-covariance model from the sample data. The standardized root mean square residual (SRMR) represents that average covariance across the standardized residuals based on the metric of the correlation matrix. SRMR values of less than .10 are considered representative of reasonable residual averages with values close to 0 being ideal (Byrne, 2001).

The root mean square error of approximation (RMSEA) is also a measure of the general model fit, but takes into account model complexity and is not as dependent on sample characteristics as the chi square value. Values of less than .05 are indicative of

good model fit, while values between .05 and .10 suggest moderate fit. Values exceeding .10 are indicative of poor fit (Raykov & Marcoulides, 2000). Byrne (2001) also suggested it is important to consider and report 90% confidence interval corresponding to the RMSEA.

The comparative fit index (CFI) is measure of incremental fit. The CFI indicates the improvement of overall fit of a model as compared to that of a null model calculated where all variables are completely independent (Byrne, 2001). Values for the CFI may range from 0 to 1.0, and a value greater than or equal to .90 is considered representative of adequate fit. Hu and Bentler (1999) recommend using a more stringent cut-off value closer to .95. When interpreting the CFI, a CFI of .90 indicates that the model of interest is a 90% better fit than the null model calculated using the same sample data.

The NNFI is an incremental fit index that accounts for model complexity. When using AMOS, the NNFI is called the Tucker-Lewis coefficient (TLI; although the two are identical, Arbuckle, 1995-2005). Like the CFI, the TLI ranges from 0 to 1.0 and values in excess of .90 are suggestive of adequate fit, with values approaching 1.0 being ideal. The TLI is robust to non-normal data.

In addition, a chi square difference test will be used to statistically test nested models. The chi square difference value is evaluated to determine whether the difference between the chi square values generated for each model is large enough to support that one of the models is providing a statistically significant improvement in fit over the other model. If the chi square difference shows a significant difference between the original model and the nested model, created by adding an additional constraint, the modification is accepted as significantly improving the model fit.

In presenting results for each model, standardized path values for each of the data packets are presented. In general, path values that are greater than .70 and statistically significant are viewed as suggestive of relatively strong association with the latent constructs. Table 12 provides a summary of the fit indices and corresponding values considered to be representative of positive results.

Structural Equation Modeling Results

Two-factor model. The first model tested was a two-factor model that utilized the item parcels generated from items from the RADS and RCMAS. Factor loadings, path values, and the correlation between NA and PA for the two-factor model are presented in Figure 1. The factor loadings ranged from .58 to .87 and were all statistically significant ($p < .01$). The correlation between NA and PA was negligible ($r = -.034$) suggesting that they are nearly independent of one another. The fit indices associated with this initial two-factor model are presented in Table 13. For the most part, these fit

Table 12

Summary of Fit Indices and Corresponding Values

Index	Value indicating adequate fit
Chi square (x^2)	Nonstatistically significant value
Standardized root mean square residual (SRMR)	$\leq .10$, 0 = perfect fit
Root mean square error of approximation (RMSEA)	< .05 = good fit, .05 to .10 = adequate fit, > .10 = poor fit
Comparative fit index (CFI)	$\geq .90$ adequate, $\geq .95$ ideal
Tucker-Lewis index (TLI)	Not significantly lower than CFI
Chi square difference (Δx^2)	Δx^2 is statistically significant

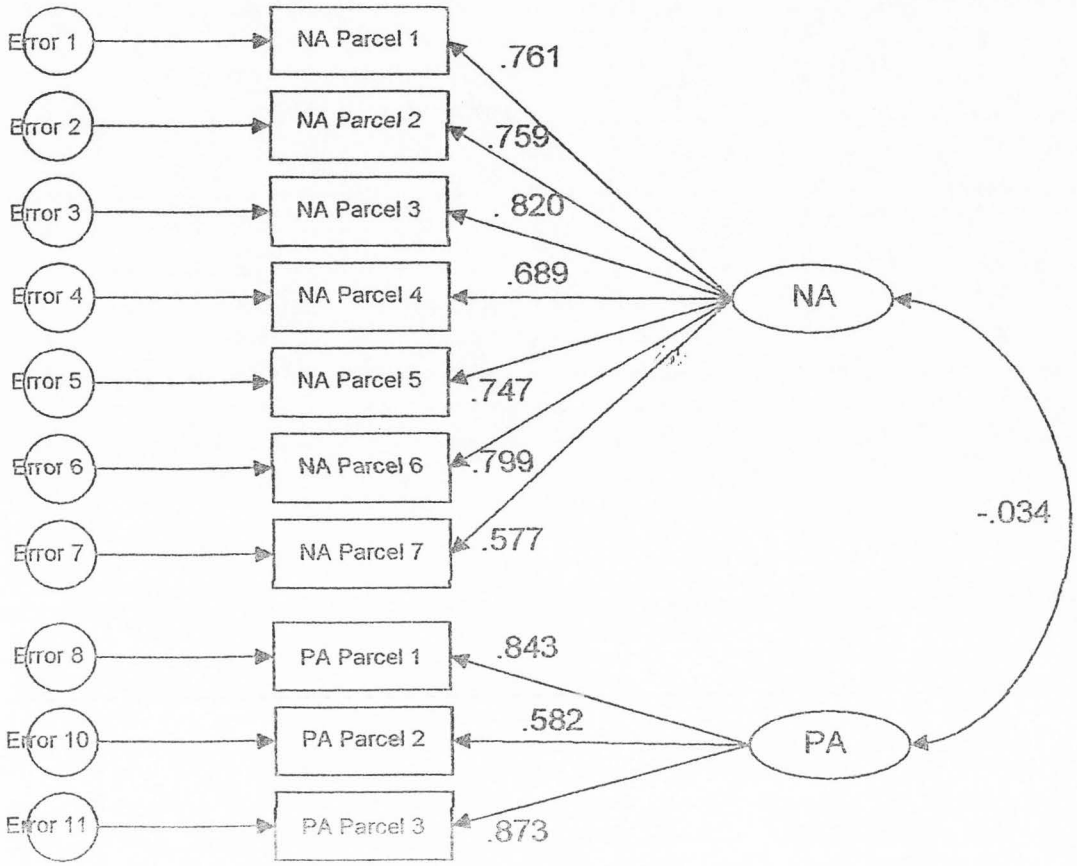

Figure 1. Two-factor model using RCMAS and RADS data.

Table 13

Fit Statistics for Models Generated from Statistical Item Parcels Using Items from the RADS and RCMAS

Model	x^2	*df*	SRMR	RMSEA	90% CI	CFI	TLI
Two-factor	341.39	34	.075	.115	.104-.125	.909	.879
Three-factor	408.99	62	.062	.091	.082-.099	.912	.890
Modified two-factor	165.46	34	.036	.075	.064-.087	.961	.948
Modified three-factor	239.79	62	.036	.065	.056-.074	.955	.943

Three-factor model. A three-factor model of NA, PA, and PH, using the statistical item parcels generated from items from the RADS and RCMAS was tested. The factor loadings and correlations among NA, PA, and PH for the three-factor model are displayed in Figure 2. For this model all factor loadings were statistically significant ($p < .01$) and ranged from .447 to .873. The correlation between NA and PH was strong at .821, while the correlations between NA and PH was strong at .821, while the

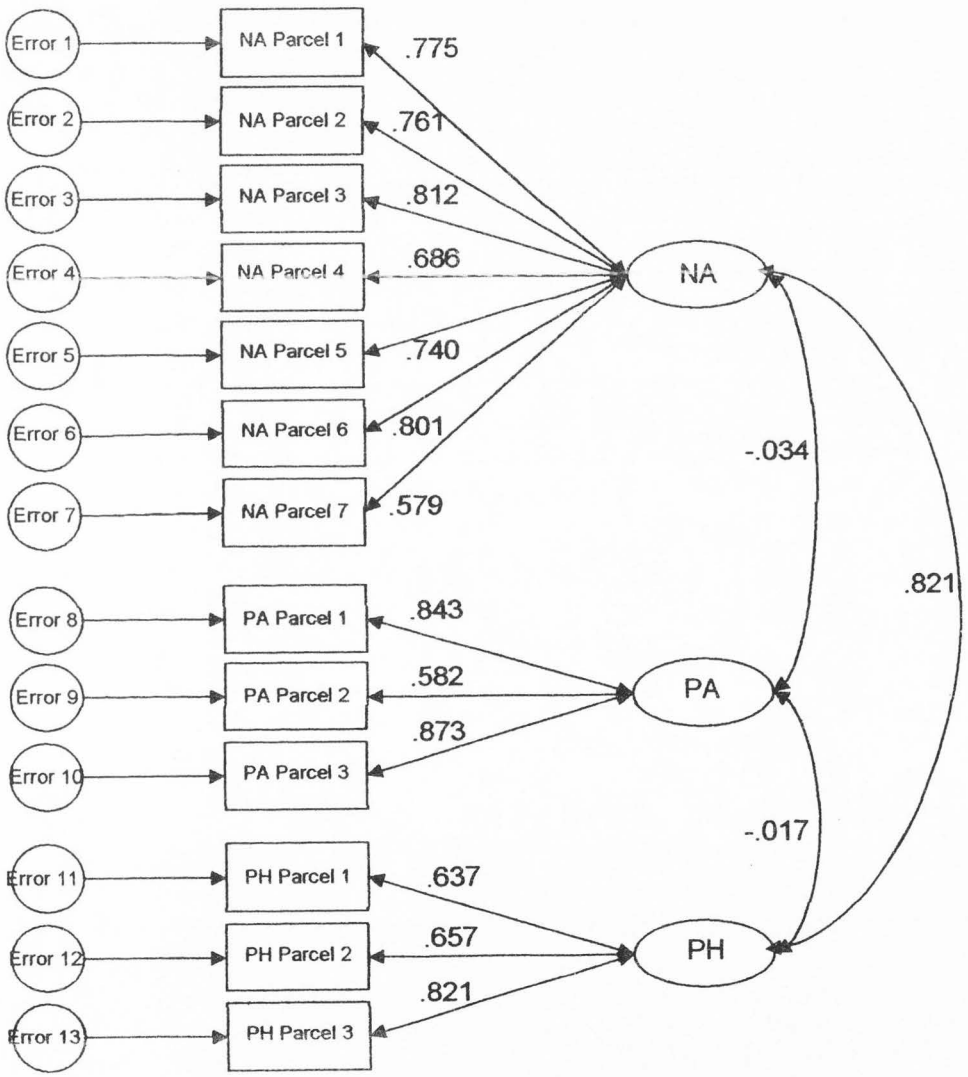

Figure 2. Three-factor model using RCMAS and RADS data.

between NA and PA and between PA and PH were minimal and statistically nonsignificant (r = -.034 and r =-.017, respectively). The fit indices presented in Table 13 demonstrate a minimally adequate fit of the model to the data. The CFI, SRMR and RMSEA are suggestive of a minimally adequate fit, while the TLI fell below the accepted .90 level for adequate fit.

Post hoc model specification. The fit indices indicated that the initial three-factor model provided a better fit to the data than the initial two-factor model; however, the modification indices suggested several points of model misspecification, therefore post hoc model fitting was undertaken. Modification indices from the initial three-factor model suggested that Parcel 4 for NA was not performing well. Cronbach alpha for NA Parcel 4 was .491, the lowest of any of the negative affectivity parcels. Examining the correlations among the individual items revealed that one item ("I feel upset." RADS item 16) was very weakly correlated with all of the other NA items (-.088 to .036) and moderately to perfectly negatively correlated with each of the PA items (-.412 to -1.00), suggesting that the item was not a good indicator of NA and may have fit better as a reverse scored PA item. Based on this, the item "I feel upset" was dropped from NA Parcel 4, and the three-factor model was retested without the item. The resulting fit indices provided in Table 13, suggest improved model fit with each of the fit indices indicating good model fit (SRMR = .036, RMSEA = .090, CFI = .955, and TLI = .943). Factor loadings, path values, and the correlations among the latent variables are presented in Table 14.

Because dropping the item "I feel upset" from NA Parcel 4 resulted in better fit for the three-factor model, the two-factor model was also retested after dropping that item from NA Parcel 4. The fit indices resulting from the retesting of the modified two-factor model are presented in Table 13 and suggest good model fit, much improved over the

Table 14

Factor Loadings and Correlations for the Modified Models Generated From the RADS and RCMAS Items

Item parcels	Factor loading for two-factor model	Factor loading for the three-factor-model
NA 1	.755	.769
NA 2	.767	.768
NA 3	.831	.824
NA 4[a]	.773	.765
NA 5	.742	.737
NA 6	.793	.797
NA 7	.566	.570
PA 1	.842	.842
PA 2	.582	.582
PA 3	.874	.874
PH 1		.636
PH 2		.659
PH 3		.444
NA--PA correlation	.019	.019
NA--PH correlation		.810
PA--PH correlation		-.017

[a]"I feel upset" deleted from the parcel.

initial two-factor model (SRMR = .036, RMSEA = .075, CFI = .961, and TLI = .948). These fit indices are approximately equivalent to those obtained from the modified three-factor model. The factor loadings and correlations among the latent constructs are presented in Table 14.

Research Question #2

The second research question examined whether the previously identified model of best fit for the data from the RADS and RCMAS is invariant across the depressive,

anxious, comorbid (depressive and anxious), and other diagnostic groups. The sample size across groups varied widely. The depressive diagnostic group was largest (n = 448), while the anxious diagnostic group was smallest (n = 27). The comorbid diagnostic group consisted of 89 subjects, while the other diagnostic group had 118 subjects. The anxious diagnostic group had an insufficient sample size to support the analyses, and so was not included in the analyses. During initial model fitting, the modified two-factor and three-factor models provided a similar fit to the data for the RADS and RCMAS; therefore both of those models were tested for model invariance.

Description of Procedure for Testing Model Invariance

As a precursor to the examination of model invariance, the identified model of best fit, considered the baseline model, was run for each of the diagnostic subsamples separately. The fit statistics for each group were assessed then to determine whether the model being examined provided an adequate fit to the data.

If the baseline model provided an adequate fit to the data for each group, multisample tests of invariance were conducted. AMOS was used to conduct a multisample analysis of model invariance, employing a nested hierarchy of models, simultaneously considering data from all diagnostic groups. As a first step in this iterative process, an unconstrained model in which only the pattern of fixed and freed parameters was the same, was tested. Then, a more restrictive model in which all factor loadings (path values) were held constant across groups was tested. Finally, in a third model, the factor loadings, factor variances, and covariances were held constant across groups during testing. Although other constraints could be imposed, Byrne (2001) reported that these are overly restrictive tests of data and so were not investigated. At each step of invariance testing, AMOS was used to provide relevant path values and

correlations for each group, as well as overall model fit statistics. Chi-square difference tests were used to determine whether the difference between the baseline and constrained models were statistically significant. If the difference between the more and less constrained models is nonsignificant, it can be concluded that the model performs equally across groups and is invariant at that step of the analysis.

Test of Model Invariance for the Two-Factor Model of Best Fit for RADS and RCMAS Data

As a precursor to the examination of model invariance, the baseline two-factor model was run for each of the diagnostic groups separately. The results of these analyses are presented in Table 15. The fit statistics appeared relatively consistent across diagnostic groups suggesting that the model provides an adequate fit to these data. Factor loadings for each diagnostic group for the unconstrained two-factor model are presented in Table 16. An examination of the factor loadings indicated that all paths values for each of the diagnostic groups were statistically significant at $p < .001$.

AMOS was subsequently used to test model invariance. Table 17 presents the results of model constraints across diagnostic groups in the multisample test of

Table 15

Fit Statistics for Two-Factor Model of Best Fit Generated from Using Items from the RADS and RCMAS for Diagnostic Subsamples

Model	x^2	*df*	SRMR	RMSEA	90% CI	CFI	TLI
Two-factor	165.46	34	.0356	.075	.065-.087	.961	.948
Depressed group	127.35	34	.0399	.078	.065-.093	.957	.944
Comorbid group	40.42	34	.0531	.046	.000-.094	.986	.981
Other group	65.68	34	.0547	.089	.056-.121	.939	.919

Table 16

Factor Loadings and Correlations for the Unconstrained Two-Factor Model Generated from the RADS and RCMAS Items by Diagnostic Groups

	Factor loadings		
Item parcels	Depressed group	Comorbid group	Other group
NA 1	.753	.814	.735
NA 2	.782	.775	.721
NA 3	.824	.783	.843
NA 4[a]	.792	.806	.644
NA 5	.752	.765	.698
NA 6	.789	.810	.766
NA 7	.540	.557	.585
PA 1	.818	.902	.836
PA 2	.545	.610	.706
PA 3	.893	.870	.845
NA--PA correlation	.046	-.077	.042

[a]"I feel upset" deleted from the parcel.

Table 17

Effects of Model Constraints Across Diagnostic Groups in Multisample Analysis

				Difference from full model		
Constraints	x^2	*df*	*p*	x^2	*df*	*p*
Two-factor model						
Full/unconstrained model	278.60	136	.000			
Measurement weights constrained	305.07	160	.000	26.47	24	0.33
Structural covariances constrained	308.07	169	.000	29.47	33	0.64

of invariance for the two-factor model and Table 18 provides the fit statistics for those three models. There waas no statistically significant increase in chi-square as the models were constrained, suggesting that the two-factor model is invariant across diagnostic groups.

Table 18

Model Fit Statistics Based on Model Constraints for the Two-Factor Model

	x^2	*df*	*p*	CFI	TLI	RMSEA	90% CI	SRMR
Two-factor model								
1	278.60	136	.000	.956	.942	.039	.033-.046	.0399
2	305.07	160	.000	.956	.950	.037	.030-.043	.0401
3	308.07	169	.000	.958	.955	.035	.029-.041	.0402

Note. 1 = unconstrained model, 2 - all factor loadings constrained, 3 = factor loadings and factor covariances constrained.

Test of Model Invariance for the Three-Factor Model of Best Fit for RADS and RCMAS Data

As was the case for the two-factor model, the baseline unconstrained model for the three-factor model of best fit for the data from the RADS and RCMAS was run for each of the diagnostic groups as a precursor to the examination of model invariance. The three-factor model for the comorbid group resulted in a solution that was not admissible and attempts to generate an admissible solution were unsuccessful. Therefore, the comorbid group was not included in subsequent invariance analyses. Problems such as this are more common when sample size is small (< 100). The results of these analyses for the depressed and other groups are presented in Table 19. Path values for the depressed and other groups for the unconstrained models are provided in Table 20. Paths values for each of the diagnostic groups, regardless of level of model constraint were statistically significant at p <.001.

As the fit statistics indicated that the model provides an adequate fit to the data, AMOS was used to test model invariance. The results of model constraints across diagnostic groups in the multisample test of invariance for the three-factor model are presented in Table 21. There was no statistically significant increase in chi-square value as the models were constrained, suggesting that the three-factor model is invariant

Table 19

Fit Statistics for Three-Factor Model of Best Fit Generated From Using Items from the RADS and RCMAS for Diagnostic Subsamples

Model	x^2	*df*	SRMR	RMSEA	90% CI	CFI	TLI
Three factor	239.79	62	.0358	.065	.056-.074	.955	.943
Depressed group	177.20	62	.0405	.064	.053-.076	.955	.943
Other group	103.93	32	.0602	.076	.049-.101	.934	.917

Note. Fit statistics are not provided for the Comorbid group due to absence of admissible solution.

Table 20

Factor Loadings and Correlations for Unconstrained Three-Factor Model Generated from the RADS and RCMAS Items by Diagnostic Groups

	Factor loadings	
Item parcels	Depressed group	Other group
NA 1	.765	.752
NA 2	.782	.724
NA 3	.816	.835
NA 4[a]	.785	.638
NA 5	.748	.694
NA 6	.794	.771
NA 7	.545	.574
PA 1	.818	.839
PA 2	.545	.707
PA 3	.893	.841
PH 1	.635	.650
PH 2	.646	.728
PH 3	.451	.510
NA--PA correlation	.046	.043
NA--PH correlation	.767	.794
PA--PH correlation	-.013	-.034

[a]"I feel upset" deleted from the parcel.

Table 21

Effects of Model Constraints Across Diagnostic Groups in Multisample Analysis

				Difference from full model		
Constraints	x^2	*df*	*p*	x^2	*df*	*p*
Three-factor model						
Full/unconstrained model	428.87	248	.000			
Measurement weights constrained	457.93	278	.000	29.06	30	0.51
Structural covariances constrained	475.80	296	.000	46.93	48	0.52

across diagnostic groups. Table 22 provides the fit statistics for each the models (unconstrained and constrained). The fit statistics are similar regardless of level of constraint.

Research Question #3

The third research question asked whether a three-factor model including NA, PA, and PH provides a better fit to the data than a two-factor model including NA and PA, based on items selected from the MACI, RADS, and RCMAS. It was hypothesized that the data obtained from the sample of inpatient adolescents would best support the three-factor model consistent with the tripartite model. Confirmatory factor analysis was used to test the two- and three-factor model using the item parcels generated from the MACI, RADS, and RCMAS. Item parcel means, standard deviations, skewness, and kurtosis for the statistically generated parcels of MACI, RADS and RCMAS items are provided in Table 23. Unlike the parcels generated based solely on the RADS and RCMAS items that were almost all negatively skewed, only 14 of 24 statistically generated packets were negatively skewed. About half of the remaining items parcels were positively skewed, with the others being more normally distributed.

Table 22

Model Fit Statistics Based on Model Constraints for the Three-Factor Model

	x^2	*df*	*p*	CFI	TLI	RMSEA	90% CI	SRMR
Three-factor model								
1	428.87	248	.000	.953	.941	.033	.028-.038	.0405
2	457.93	278	.000	.953	.947	.031	.026-.036	.0408
3	475.80	296	.000	.953	.951	.030	.025-.035	.0412

Note. 1 = unconstrained model, 2 = all factor loadings constrained, 3 = factor loadings and factor covariances constrained.

Table 23

Means, Standard Deviations, Skewness, and Kurtosis for the Statistically Generated Item Parcels from the MACI, RADS, and RCMAS Items

Item parcel	Mean	Standard deviation	Skewness	Kurtosis
NA 1	3.07	1.90	-.478	-1.29
NA 2	1.44	1.29	.066	-1.70
NA 3	2.32	1.52	-.296	-1.41
NA 4	1.54	1.22	-.054	-1.57
NA 5	1.70	1.15	-.289	-1.36
NA 6	1.74	1.09	-.227	-1.28
NA 7	1.10	.847	-.187	-1.58
NA 8	2.21	1.51	-.186	-1.41
NA 9	1.19	1.12	.422	-1.20
NA 10	1.59	1.15	-.110	-1.41
NA 11	2.83	1.71	-.207	-1.28
NA 12	1.39	1.07	.111	-1.25
NA 13	.928	1.08	.771	-.789
NA 14	1.92	.728	-.132	-.509
NA 15	1.96	1.37	.006	-1.22
NA 16	1.69	1.13	-.211	-1.37
NA 17	.952	1.30	1.23	.320
PA 1	.703	.831	.600	-1.29
PA 2	3.06	1.42	-.294	-.768
PA 3	1.67	1.16	-.242	-1.40
PH 1	1.35	1.24	.186	-1.60
PH 2	.954	.969	.746	-.642
PH 3	.664	.728	-.614	-.895
PH 4	3.35	1.61	-.707	-.841

Data were analyzed using AMOS 6.0 ML estimation. In each case, the covariance matrix was analyzed and error terms of the observed variables were not allowed to correlate. For both the two-factor and three-factor models, the latent factors were free to correlate and be estimated from the data. A single observed factor loading was constrained to 1.0 for each latent variable.

Structural Equation Modeling Results

Two-factor model. A two-factor model using statistically generated parcels of items from the MACI, RADS, and RCMAS was tested. Path values, factor loadings, and the correlation between the latent factors are presented in Figure 3. The factor loadings ranged from -.674 to .842 and all path values were statistically significant ($p < .01$). The correlation between NA and PA was strong and negative (-.923). The fit indices for this initial two-factor model are presented in Table 24. These fit indices demonstrate a poor fit of the model to the data. Only the SRMR fell within the acceptable range.

Three-factor model. A three-factor model of NA, PA, and PH, using the statistical item parcels generated from items from the MACI, RADS, and RCMAS was tested. The factor loadings and correlations among NA, PA, and PH for this model are presented in Figure 4. All factor loadings were statistically significant ($p < .01$) and ranged from -.641 to .841. The correlation between NA and PH was strong and positive at .955, while the correlations between NA and PA and between PA and PH were also large, but in the negative direction ($r = 0.939$ and $r = -.941$, respectively).

The fit indices presented in Table 24 also illustrate a poor fit of the model for the data. While the residual error indices are suggestive of minimally adequate fit, the CFI and TLI (.807 and .786) fell well below the accepted level for adequate fit.

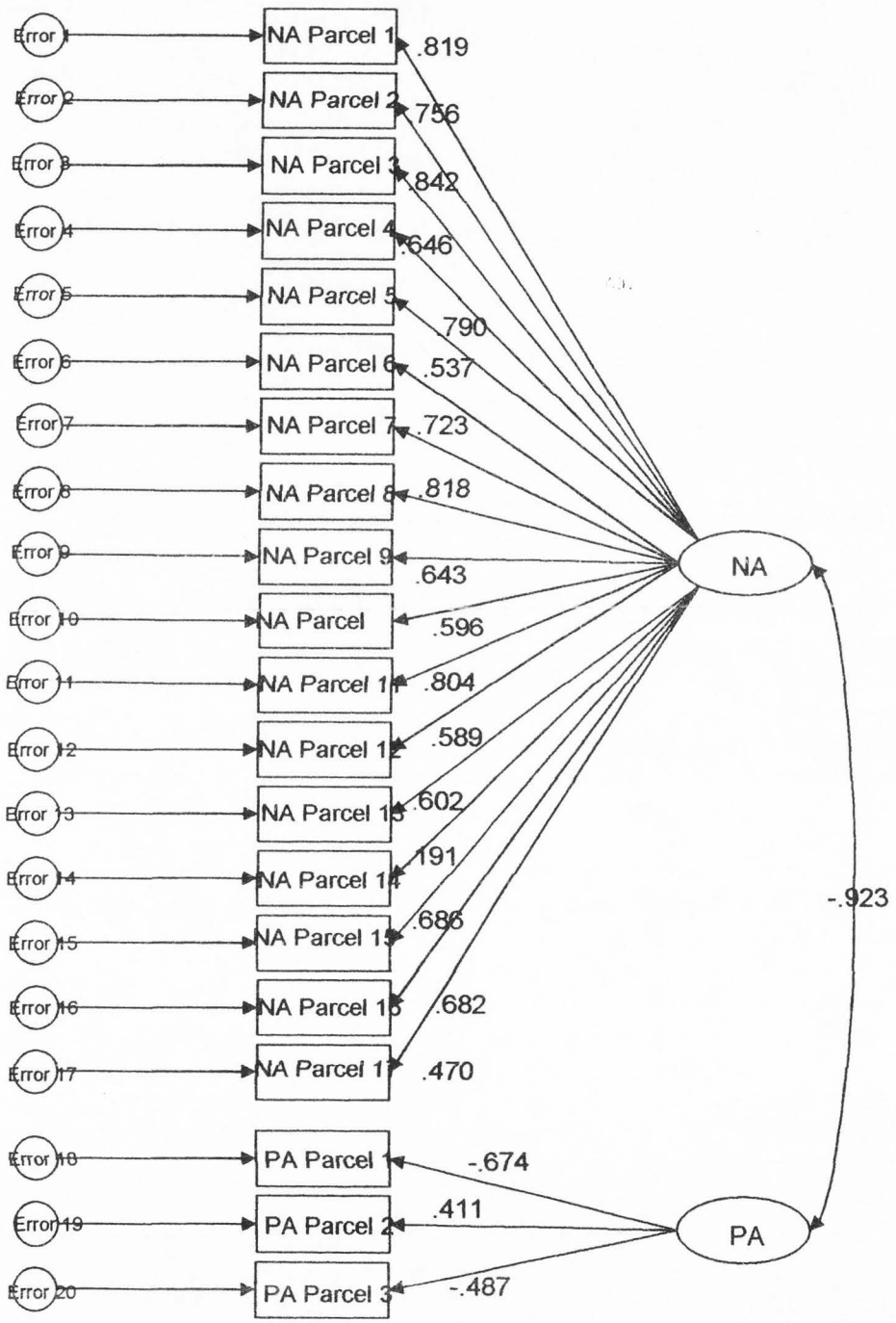

Figure 3. Two-factor model using MACI, RADS, and RCMAS data.

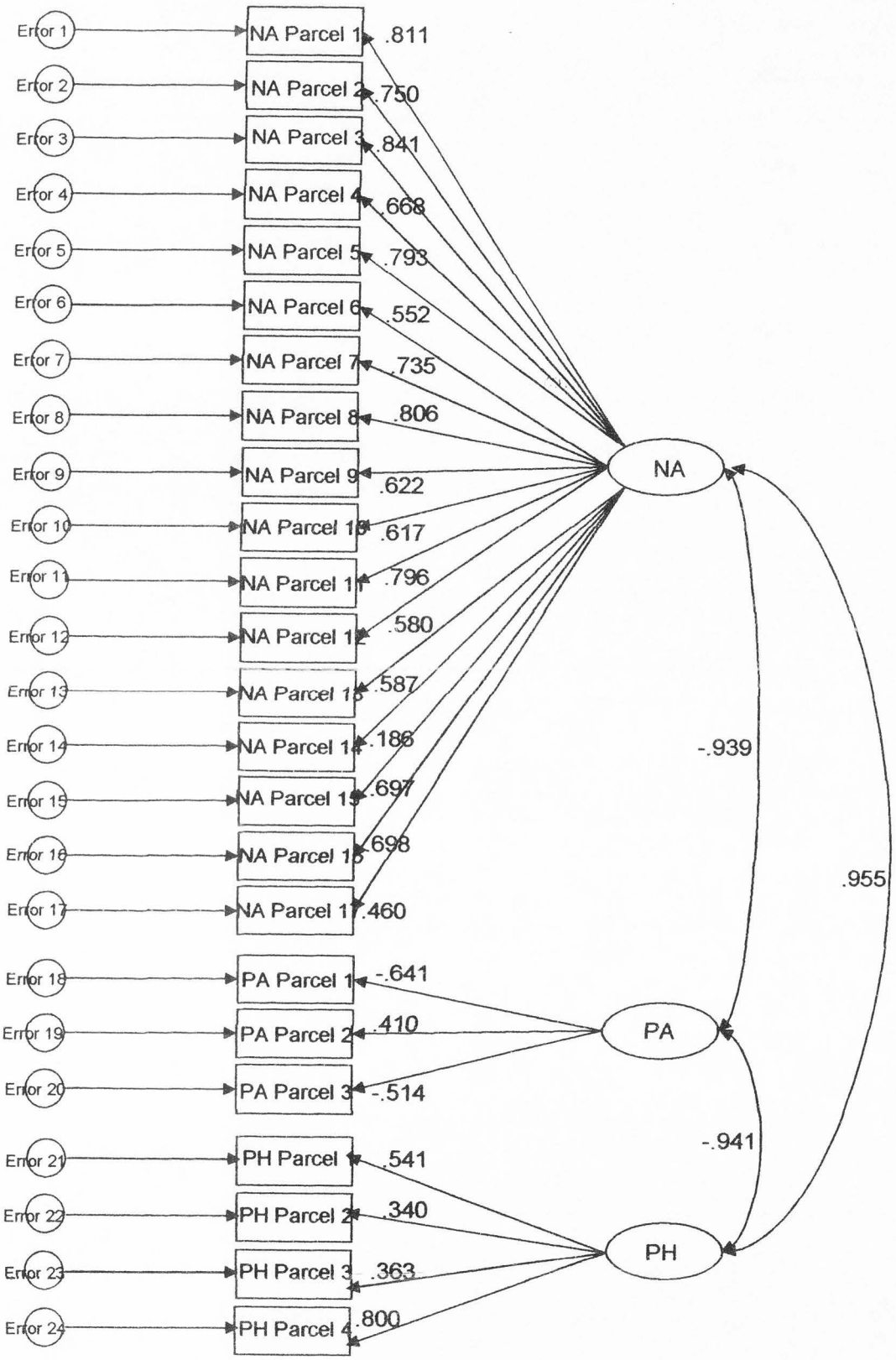

Figure 4. Three-factor model using MACI, RADS, and RCMAS data.

Table 24

Fit Statistics for Models Generated from Statistical Item Parcels Using Item from the MACI, RADS, and RCMAS

Model	x^2	*df*	SRMR	RMSEA	90% CI	CFI	TLI
Two-factor	767.11	169	.0723	.106	.099-.114	.826	.805
Three-factor	1041.92	249	.0750	.101	.094-.107	.805	.783

One-factor model. Although it was not part of the original research question, a one-factor model was examined because neither the initial two-factor nor the three-factor models using the item parcels from the MACI, RADS, and RCMAS provided an acceptable fit to the data and the correlations between the latent variables was so high. In this model each of the item parcels associated with NA, PA, and PH are associated with a single latent variable, distress. It is graphically represented in Figure 5. In an attempt to enhance the fit of the one-factor model, the 17-item parcels associated with NA were condensed into 4 parcels by combining the parcels with the strongest positive correlations to each other. This analysis resulted in a model where each of the path values were statistically significant ($p < .001$) and factor loadings ranged from -.32 to .88. The resulting GFI was .888 and SRMR was .0680, which were somewhat better than the initial one-factor model, but still below acceptable fit.

Post Hoc Model Specification

The fit indices indicated that neither the two- or three-factor models provided an adequate fit to the data. The modification indices associated with both the two- and three-factor models suggested multiple points of model misspecification. Therefore post hoc model fitting was attempted.

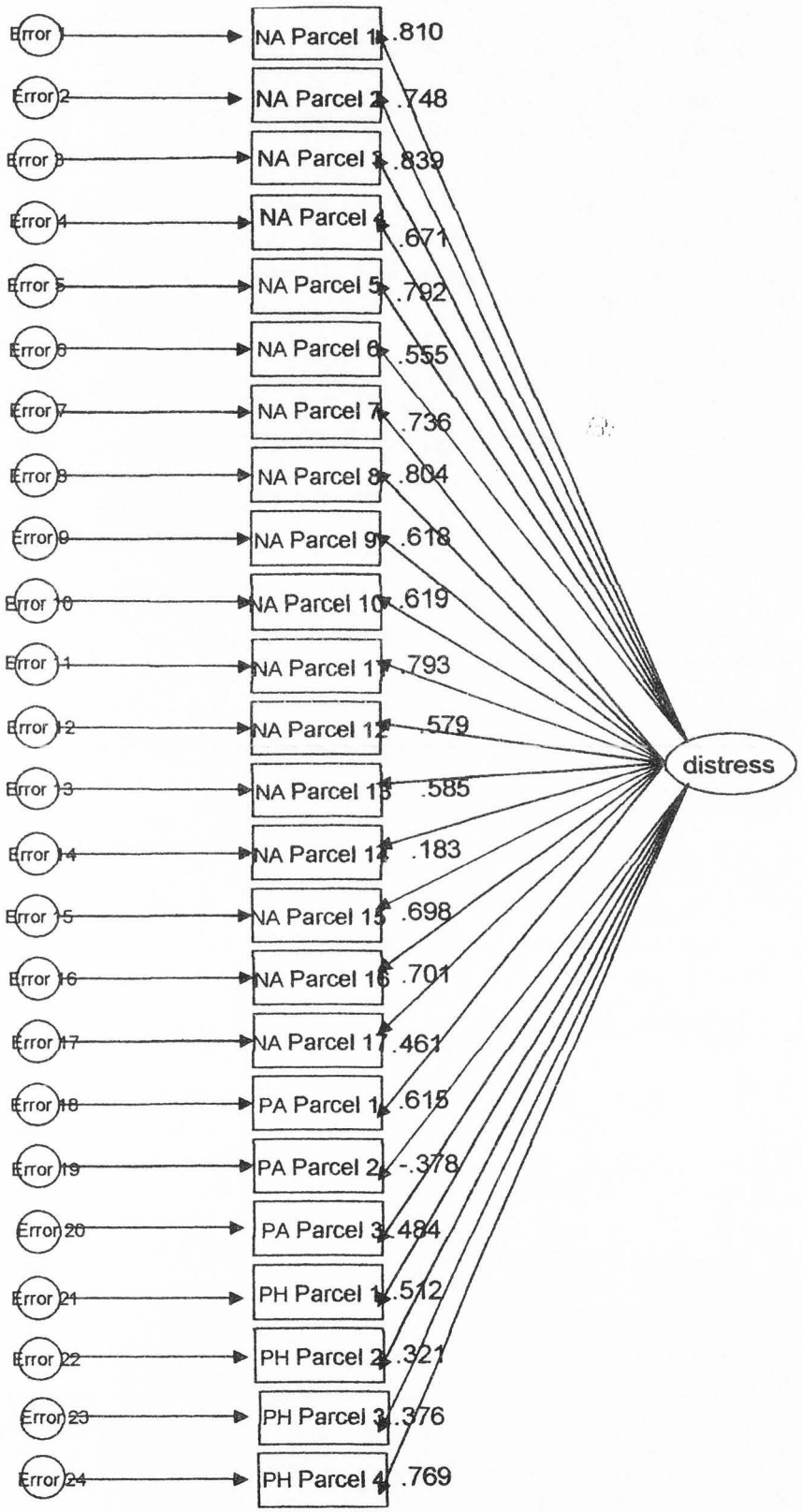

Figure 5. One-factor model using MQACI, RADS, and RCMAS data.

Two-factor model. Several modifications were made to see whether a model that provided an acceptable fit could be achieved. The largest modification index suggested that the error terms of item parcels NA 7 and NA 15 were correlated. NA 7 included items like "I feel that no one cares about me, " and "I feel like nothing I do helps anymore," while NA 15 consisted of items such as "So little of what I have done has been appreciated by others," and "I feel upset." Based on both the statistical and conceptual relationship between the parcels, the error terms for NA 7 and NA 15 were freed to correlate. The results for Model 1 was a minimal, but statistically significant improvement in model fit ($\Delta x^2 = 79.16$, $p < .001$); however, the model fit was still unsatisfactory. Fit statistics for this model and subsequent post hoc models are presented in Table 25.

In Model 2, a second error term between item parcels NA 4 and NA 10 was freed to correlate. The content of both the parcels was associated with worry. The modification index associated with those parcels was 55.64. This modification resulted in a statistically significant improvement in model fit ($\Delta x^2 = 60.55$, $p < .001$); however, the model fit was still unacceptable.

Table 25

Fit Statistics for Post Hoc Two-Factor Models Generated from Parcels Using Items from the MACI, RADS, and RCMAS

Model	x^2	*df*	SRMR	RMSEA	90% CI	CFI	TLI
Model 1[a]	647.77	168	.0704	.099	.091-.107	.851	.831
Model 2[b]	587.22	167	.0687	.093	.085-.101	.869	.851

[a] Path between error terms for parcels NA 7 and NA 15 were freed to correlate. [b] Path between error terms for parcels NA 7 and NA 15 and NA 4 and NA 10 were freed to correlate.

The next potential point of model misspecification was the error term between NA 13 and NA 17. However, conceptually it did not make sense to free the paths between the error terms as their content was not similar. Item parcel NA 13 contained items relating to worry and feelings of fear, while NA 17 focused on negative self-evaluation and included items such as "I feel I am bad," and "I feel I am no good." Additionally, freeing the path between the error terms of parcels NA 13 and NA 17 would produce only minimal changes in model fit, although the change would still be statistically significant ($\Delta x^2 = 33.53$, $p < .001$). The remaining modification indices were very modest suggesting no major points of misspecification. Therefore, post hoc model fitting was terminated and Model 2 was identified as the model of "best" fit. Factor loadings and correlations for Model 2, the two-factor model providing the best fit to the MACI, RADS, and RCMAS data, are presented in Table 26.

Three-factor model. Several modifications were also made to see if a three-factor model of acceptable fit to the data could be achieved. As was the case with the two-factor model, the largest modification index suggested a correlation between the error terms of item parcels NA 7 and NA 15. Based on the statistical and conceptual relationship between the two parcels, the error terms for NA 7 and NA 15 were freed to correlate. The result was a statistically significant improvement in model fit ($\Delta x^2 = 72.68$, $p < .001$). The fit statistics for this (Model 1) and subsequent post hoc three-factor models are provided in Table 27.

For Model 2, a second error term between item parcels NA 4 and NA 10 was allowed to correlate. As was the case in the two-factor models, the content of both parcels was related to worry. The modification index associated with parcels NA 4 and NA 10 was 28.76. This second modification resulted in a statistically significant

Table 26

Factor Loadings and Correlations for the Post Hoc Two-Factor Model Generated From the MACI, RADS, and RCMAS Items

Item parcel	Factor loading
NA 1	.825
NA 2	.762
NA 3	.842
NA 4	.627
NA 5	.793
NA 6	.519
NA 7	.701
NA 8	.828
NA 9	.657
NA 10	.571
NA 11	.808
NA 12	.596
NA 13	.609
NA 14	.188
NA 15	.656
NA 16	.670
NA 17	.480
PA 1	-.687
PA 2	.407
PA 3	-.479
NA--PA correlation	-.912
Error NA 7--Error NA 15 correlation	.508
Error NA 4--Error NA 10 correlation	.444

Note. Based on Model 2.

Table 27

Fit Statistics for Post Hoc Three-Factor Models Generated from Parcels Using Items from the MACI, RADS, and RCMAS

Model	x^2	*df*	SRMR	RMSEA	90% CI	CFI	TLI
Model 1[a]	904.58	248	.0733	.096	.089-.102	.826	.806
Model 2[b]	851.83	247	.0707	.092	.085-.099	.839	.820

[a] Path between error terms for parcels NA 7 and NA 15 were freed to correlate. [b] Path between error terms for parcels NA 7 and NA 15 and NA 4 and NA 10 were freed to correlate.

For Model 2, a second error term between item parcels NA 4 and NA 10 was allowed to correlate. As was the case in the two-factor models, the content of both parcels was related to worry. The modification index associated with parcels NA 4 and NA 10 was 28.76. This second modification resulted in a statistically significant improvement in model fit ($\Delta x^2 = 52.75$, $p < .001$). However, the model fit for Model 2 was still not acceptable.

The remaining modification indices were small (< 25.00). The next potential point of model misspecification was the error terms between NA 13 and NA 17. As discussed previously, it did not make sense to free the paths between the error terms because their content was not similar. Parcel NA 13 related to worry and fear, while NA 17 related to negative self-evaluation. Freeing the path between the error terms for the two parcels would produce minimal, but statistically significant changes in model fit ($\Delta x^2 = 36.01$, $p < .001$). The remaining modification indices were very modest (< 20.00) and suggested no major points of misspecification. Therefore, post hoc model fitting was terminated and Model 2 was identified as the model of "best" fit. It appeared that it was not possible to construct a model of good fit for the data from the MACI, RADS, and

RCMAS without excessive model fitting. Factor loadings and correlations for the three-factor model providing the best fit to the data are presented in Table 28.

Research Question #4

The fourth research question examined whether the previously identified model of best fit for the data from the MACI, RADS, and RCMAS is invariant across the depressive, anxious, comorbid, and other diagnostic groups. As was the case for the previous test of model invariance, the sample size across groups varied widely. There were only 4 subjects in the anxiety diagnostic group, therefore tests of invariance did not include the anxious subsample. Sample sizes for the depressive, comorbid, and other diagnostic groups were 186, 51, and 50, respectively. As discussed in the previous section, neither of the models provided and adequate fit to the data, yet they represented the best models available, therefore these models were tested for invariance.

Test of Model Invariance for the Two-Factor Model of Best Fit for MACI, RADS, and RCMAS Data

The baseline two-factor model was run for each of the diagnostic groups separately as a precursor to the examination of model invariance. Using the data from the other diagnostic group sample for the two-factor model resulted in a solution that was not admissible. The sample size for the other diagnostic group was small and the number of variables large was large (n = 50 and the number of variables = 43) increasing the impact of sample variations and potential anamolies in the data. The results of these analyses are presented in Table 29.

In an attemt to generate an admissible solution, the number of variables was decreased by condensing the 17 NA parcels into 4 NA parcels by combining parcels that

Table 28

Factor Loadings and Correlations for the Post Hoc Three-Factor Model Generated from the MACI, RADS, and RCMAS Items

Item parcel	Factor loading
NA 1	.819
NA 2	.758
NA 3	.842
NA 4	.651
NA 5	.797
NA 6	.536
NA 7	.715
NA 8	.818
NA 9	.636
NA 10	.593
NA 11	.801
NA 12	.588
NA 13	.595
NA 14	.184
NA 15	.670
NA 16	.688
NA 17	.470
PA 1	-.648
PA 2	.405
PA 3	-.511
PH 1	.541
PH 2	.338
PH 3	.365
PH 4	.800
NA--PA correlation	-.933
NA--PH correlation	.939
PA--PH correlation	-.936
Error NA 7--Error NA 15 correlation	.490
Error NA 4--Error NA 10 correlation	.418

Note. Based on Model 2.

Table 29

Fit Statistics for Two-Factor Models of Best Fit Generated from Using Items from the MACI, RADS, and RCMAS for Diagnostic Subsamples

Model	x^2	*df*	SRMR	RMSEA	90% CI	CFI	TLI
Two-factor	587.22	167	.0687	.093	.085-.101	.869	.851
Depressed group	431.96	167	.0697	.093	.082-.103	.870	.852
Comorbid group	292.35	167	.1037	.123	.099-.146	.784	.754

Note. Fit statistics are not provided for the Other group due to absence of admissible solution.

were most strongly correlated with one another. Despite the reduction in the number of variables, the two-factor model for the data still resulted in an inadmissible solution for the other group, therefore, the other group was not included in invariance testing and Model 2 was maintained as the model of best fit. The fit statistics appeared relatively consistent across the depressive and comorbid groups suggesting that the model provides a similar fit to the data for each of the groups. Factor loadings for each diagnostic group for the unconstrained two-factor model are presented in Table 30. Factor loadings were all statistically significant at $p < .001$ for the unconstrained model, and at $p < .05$ for the path from NA to NA 14 for the depressive diagnostic group ($p = .021$); and, PA to PA 1 ($p = .036$), and PA to PA 3 ($p = .036$) for the comorbid group. The only path that was not statistically significant was from NA to NA 14 ($p = .186$) for the comorbid group.

AMOS was subsequently used to test model invariance. Table 31 presents the results of model constraints across diagnostic groups in the multisample test of invariance for the two-factor model, while Table 32 provides the fit statistics for the three models used on level of constraint. There were no statistically significant increases in

Table 30

Factor Loadings and Correlations for Two-Factor Models Generated from the MACI. RADS and RCMAS Items by Diagnostic Groups

Item parcels	Factor loadings	
	Depressed group	Comorbid group
NA 1	.815	.826
NA 2	.771	.635
NA 3	.823	.868
NA 4[a]	.636	.629
NA 5	.793	.760
NA 6	.561	.561
NA 7	.713	.691
NA 8	.826	.783
NA 9	.684	.660
NA 10	.577	.449
NA 11	.819	.772
NA 12	.552	.647
NA 13	.572	.610
NA 14	.175	.192
NA 15	.638	.709
NA 16	.672	.668
NA 17	.457	.454
PA 1	-.719	-.765
PA 2	.450	.333
PA 3	-.422	-.720
NA--PA correlation	-.913	-.773
Error 7--Error 15 correlation	.544	.381
Error 4--Error 10 correlation	.397	.599

[a]"I feel upset" deleted from the parcel.

Table 31

Effects of Model Constraints Across Diagnostic Groups in Multisample Analysis

				Difference from full model		
Constraints	x^2	*df*	*p*	x^2	*df*	*p*
Two-factor model						
Full/unconstrained model	991.18	501	.000			
Measurement weights constrained	1016.29	537	.000	25.11	36	.91
Structural covariances constrained	103.13	543	.000	38.95	42	.61

Table 32

Model Fit Statistics Based on Model Constraints for the Two-Factor Model

	x^2	*df*	*p*	CFI	TLI	RMSEA	90% CI	SRMR
Two-factor model								
1	991.18	501	.000	.844	.822	.059	.053-.064	.0697
2	1016.29	537	.000	.847	.838	.056	.051-.061	.0726
3	1030.13	543	.000	.845	.837	.056	.051-.061	.0730

Note. 1 = unconstrained model, 2 = all factor loadings constrained, 3 = factor loadings and factor covariances constrained.

the chi-square values as the models were constrained, suggesting that the model is invariant across diagnostic groups.

Test of Model Invariance for the Three-Factor Model of Best Fit for MACI, RADS, and RCMAS Data

As was the case for the two-factor model, the baseline unconstrained model for the three-factor model of best fit for the data from the MACI, RADS, and RCMAS was run for each of the diagnostic groups as a precursor to testing model invariance. Using the data from the other diagnostic group sample for the three-factor model resulted in a solution that was not admissible, as it did for the two-factor model. As was the case with the two-factor model, attempts to generate an admissible solution were not successful

and therefore the other diagnostic group was not included in invariance testing. The results of these analyses for the depressed and comorbid groups are provided in Table 33. Factor loadings for the groups are provided in Table 34. For the unconstrained model, most paths were statistically significant (p <.001). Many of the other paths were statistically significant at a lower level of significance (p < .05) including the paths from NA to NA 14 (p = .034) and from PA to PH (p = .034) for the depressive diagnosis group, and PA to PA 1 (p = .027), PA to PA 3 (p = .024), PH to PH 2 (p = .026), NA to PH (p = .014), and error 7 to error 15 (p = .019) for the comorbid diagnosis group. Only the paths from NA to NA 14, PA to PH, PA to NA for the comorbid diagnostic group were nonsignificant.

As some of the fit statistics suggested that the model provides an adequate fit to the data, AMOS was used to test model invariance. The results of model constraints across diagnostic groups in the multisample test of invariance for the three-factor model are presented in Table 35. There was no statistically significant increase in chi-square as the models were constrained, suggesting that the three-factor model is invariant across diagnostic groups. Table 36 presents the fit statistics for each of the models. The fit statistics are similar regardless of level of constraint.

Table 33

Fit Statistics for Three-Factor Models of Best Fit Generated from Using Items from the MACI, RADS, and RCMAS for Diagnostic Subsamples

Model	x^2	*df*	SRMR	RMSEA	90% CI	CFI	TLI
Three-factor	851.83	247	.0727	.092	.085-.099	.839	.820
Depressed group	627.37	247	.0743	.091	.082-.100	.841	.822
Comorbid group	394.34	247	.1011	.109	.089-.129	.780	.754

Note. Fit statistics are not provided for the Other group due to absence of admissible solution.

Table 34

Factor Loadings and Correlations for Two-Factor Models Generated from the MACI, RADS, and RCMAS Items by Diagnostic Groups

Item parcels	Factor loadings	
	Depressed group	Comorbid group
NA 1	.805	.829
NA 2	.769	.616
NA 3	.822	.862
NA 4	.664	.655
NA 5	.797	.765
NA 6	.578	.574
NA 7	.733	.691
NA 8	.814	.774
NA 9	.662	.638
NA 10	.604	.567
NA 11	.811	.769
NA 12	.544	.648
NA 13	.556	.604
NA 14	.167	.200
NA 15	.659	.714
NA 16	.689	.692
NA 17	.449	.442
PA 1	-.702	-.701
PA 2	.445	.354
PA 3	-.438	-.779
PH 1	.578	.524
PH 2	.332	.339
PH 3	.310	.593
PH 4	.822	.736
NA--PA correlation	-.927	-.764
NA--PH correlation	.937	.978
PA--PH correlation	-.851	-.872
Error 7--Error 15 correlation	.520	.378
Error 4--Error 10 correlation	.363	.584

Table 35

Effects of Model Constraints Across Diagnostic Groups in Multisample Analysis

				Difference from full model		
Constraints	x^2	*df*	*p*	x^2	*df*	*p*
Three-factor model						
Full/Unconstraiained model	1423.04	741	.000			
Structural covariances constrained	1459.77	783	.000	36.73	42	.70
Measurement weights constrained	1477.00	795	.000	53.96	54	.48

Table 36

Model Fit Statistics Based on Model Constraints for the Three-Factor Model

	x^2	*df*	*p*	CFI	TLI	RMSEA	90% CI	SRMR
Three-factor model								
1	1423.04	741	.000	.815	.793	.057	.052-.061	.0743
2	1459.77	783	.000	.816	.806	.055	.051-.060	.0763
3	1477.00	795	.000	.815	.807	.055	.051-.059	.0763

Note. 1 = unconstrained model, 2 = all factor loadings constrained, 3 = factor loadings and factor covariances constrained.

Research Question #5

The final research question addressed whether the patterns of scores for NA, PA, and PH for the depressive, anxiety, and comorbid depression and anxiety diagnostic groups were consistent with what would be expected based on the tripartite model. It was hypothesized that individuals with a depressive diagnosis would have lower levels of positive affect than would adolescents with an anxiety diagnosis, while adolescents diagnosed with anxiety disorders would have higher levels of PH than would adolescents with depressive diagnoses. Finally, adolescents having diagnoses of comorbid depressive and anxiety would have both lower levels of PA and higher levels

of PH. Based on the tripartite model, adolescents with depressive, anxiety, and comorbid depression and anxiety diagnoses would have similar levels of NA.

To answer this question, means and standard deviations were calculated for the NA, PA, and PH construct scales for each of the diagnostic groups and were compared using *t* tests (depression diagnosis group vs. anxiety diagnosis group, depression diagnosis group vs. comorbid depressive and anxiety diagnosis group, anxiety diagnosis group vs. comorbid depressive and anxiety diagnosis group). Separate analyses were conducted for data obtained from the RADS and RCMAS and from the MACI, RADS, and RCMAS. Descriptive statistics for the diagnostic groups are provided in Table 37. Sample size for the anxiety diagnosis group for subjects completing the MACI, RADS, and RCMAS was very small (n = 4) and therefore was not included in these analyses. Table 38 provides a summary of the hypotheses related to the differences in NA, PA, and PH for the various diagnostic groups and the corresponding results of the t-tests, including effect sizes.

For NA, PA, and PH based on the RADS and RCMAS, the level of NA endorsed by the depressed and anxious samples were approximately equal as hypothesized; however, the comorbid diagnostic group (consisting of subjects who were diagnosed with both a depressive disorder and an anxiety disorder) endorsed higher levels of NA than did either the depressive or anxious diagnostic groups. The anxiety diagnosis group demonstrated statistically significantly higher levels of PA than either the depressive or comorbid diagnostic groups, as hypothesized based on the tripartite model. Contrary to the research hypothesis, the anxiety diagnosis group did not endorse higher levels of PH than the depressive diagnosis group. Yet, the mixed depressive and anxiety diagnostic group manifested higher levels of PH than did the depressive diagnosis group.

Table 37

Descriptive Statistics for Depressive, Anxiety, and Comorbid Depressive and Anxiety Diagnosis Samples

Measures/ construct scale	Depressive group			Anxiety group			Comorbid depressive and anxiety group		
	n	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*
RADS/ RCMAS	448			27			89		
NA		15.42	7.12		13.26	6.60		17.10	6.77
PA		3.27	2.17		4.15	2.05		3.08	2.35
PH		3.45	2.34		3.48	2.08		4.12	2.23
MACI, RADS, and RCMAS	186			4			51		
NA		32.54	15.59		18.50	11.09		38.81	14.97
PA		4.68	1.90		5.00	1.41		4.96	2.24
PH		4.18	2.60		3.00	1.41		4.96	2.55

Table 38

Hypothesized Diagnostic Group Differences and t-Test Statistics

Hypothesis	*t*	*df*	*p*	*ES*	Accept/reject hypothesis[a]
RADS and RCMAS item construct scales					
NA dep = NA anx	1.599	473	.110	.316	+
NA dep = NA com	-2.098	535	.036	-.241	-
NA anx = NA com	-2.701	114	.008	-.593	-
PA dep < PA anx	-2.037	473	.042	.403	+
PA com < PA anx	2.129	114	.035	.522	+
PH anx > PH dep	-.073	473	.942	-.014	-
PH com > PH dep	-2.504	535	.013	.289	+
MACI, RADS, and RCMAS item construct scales					
NA dep = NA com	-2.569	235	.011	-.403	-
PH com > PH dep	-1.904	235	.058	.300	-

[a]+ = hypothesis was accepted, - = hypothesis was rejected.

For the sample that completed the MACI, RADS, and RCMAS, the level of NA endorsed by the comorbid diagnosis group was significantly higher than the depressive diagnosis group, a result that did not support the research hypothesis based on the tripartite model. Similarly, there was no significant difference between the depressive and the comorbid depressive and anxiety diagnosis groups for level of PH reported, again, a finding that was inconsistent with the research hypothesis. In general, it appeared that the comorbid depressive and anxiety diagnostic group endorsed higher levels of distress (NA and PH) and lower levels of positive affect that either the depressive or anxiety groups.

CHAPTER 5

DISCUSSION

The present study examined the structure of affect in a sample of inpatient adolescents who completed the MACI, RADS, and RCMAS. This chapter contains a summary of the key findings and a discussion of the possible implications in regards to our understanding of, and research into, the tripartite model. It also highlights the limitations of the study. Finally, possible directions for future research are examined.

Structure of Affect

Confirmatory factor analysis (CFA) was used to examine whether a two-factor of model of NA and PA or a three-factor model of NA, PA, and PH provided the best fit to the data from the RADS and RCMAS and subsequently from the MACI, RADS, and RCMAS. Both the two- and three-factor models provided similarly good fit for the data from the RADS and RCMAS. In these models, NA and PA, and PA and PH were minimally correlated, while NA and PH were strongly positively correlated with each other. The two-and three-factor models were then tested for model invariance. Tests of model invariance suggested that the two-factor model was invariant across all diagnostic groups (depressive, comorbid, and other), while the three-factor model was invariant across the depressive and other diagnostic groups and generated an inadmissible solution for the comorbid diagnostic group. However, the comorbid diagnostic group had a relatively small sample size which may have resulted in an inadmissible solution.

These results support some of findings previously discussed in the literature, such as those that demonstrated support for two-factor models for the structure of affect in children and adolescents. Several studies employing confirmatory factor analytic

methods demonstrated support for the two-factor orthogonal models of NA and PA based on data from the CDI, RCMAS, and PANAS-X (Lonigan et al., 1999; Lonigan et al., 2003).

Simultaneously, the findings from the current study are consistent with 6 other studies that identified the three-factor model as providing the best fit to the data (Chorpita, 2002; Chorpita et al., 1998; Jacques & Mash, 2004; Joiner et al., 1996; Lambert et al, 2004; Turner & Barrett, 2003). The results of the current study are most like those from the study by Chorpita and colleagues (2000), in which both the two- and three-factor models provided equally good fit to the data.

Many of these studies also reported the patterns of scores and correlations among the constructs. Lonigan ad colleagues (1999) found that NA was strongly related to both symptoms of anxiety and depression, while PA was more strongly related to depressive symptoms for adolescents. This finding is consistent with the finding from the current study that the depressed and anxiety diagnostic groups demonstrated no statistically significant differences in NA, while the anxiety diagnostic group demonstrated significantly higher levels of PA that the depressive group. Lonigan and colleagues (2003) also found that NA and PA were not significantly correlated with each other, but NA was substantially correlated with both depression and anxiety, while PA was more highly (negatively) correlated with depression. The current study found low correlations between the constructs of NA and PA for the two-factor model. Similarly, Joiner and colleagues (1996) used exploratory factor analysis to examine the structure of NA, PA, and PH in a sample of psychiatric inpatients between the ages of 8 and 16. They concluded that regardless of whether two or three factors were extracted, the factor intercorrelations were low. These findings are similar to those obtained for the current three-factor model; however, the current findings differ in regard to the

correlation between NA and PH. They reported the correlation between NA and PH to be .26, while in the current study the correlation was much stronger (r = .810). Interestingly, Chorpita and colleagues (1998) found a higher level of correlations among all factors ($r_{NA\text{-}PA}$ = -.53, $r_{NA\text{-}PH}$ = .53, $r_{PA\text{-}PH}$ = -.23).

These results provide further support for the two-factor model of NA and PA and the three-factor model of NA, PA, and PH for data from the RADS and RCMAS. It demonstrates that the constructs NA and PA and PH have utility in distinguishing depression and anxiety. Historically, PH has been the least supported of the three constructs hypothesized to explain the structure of affect. Whether this is an issue related to measurement difficulties or the quality of the construct is still an unanswered question.

The Impact of Using Items from the MACI

It was hypothesized that adding additional items from the MACI with the goal of assessing the tripartite constructs of NA, PA, and PH, would help clarify or add to our understanding of the structure of affect via additional items (indicators) that further assessed the constructs, but such was not the case. It was not possible to identify a model of acceptable fit to the data from the MACI, RADS, and RCMAS. It is generally accepted that given adequate sample size, in the presence of strong factor loadings, increases in the number of indicators per factor generally improve both model convergence and parameter estimation (Gagne & Hancock, 2006).

The unexpected finding raises the question of whether the problem is related to the theory, the model, or the method used for assessment of the constructs. Given that a large number of studies completed across several decades have demonstrated support for both the tripartite model and the associated constructs, it seems important to

address why the current study does not. One possible explanation for the poor model fit to the data from the MACI, RADS, and RCMAS may to be related to the item parcels used to assess the constructs. Gagne and Hancock (2006) reported that low-quality indicators provide minimal information and "at some point start to detract from convergence and/or the accuracy of parameter estimates within the model" (p. 67). Examination of the manifest indicators suggested that the three item parcels associated with PA for both the two- and three-factor models might be problematic because two of them had negative factor loadings, while all of the other factor loadings for the model were positive. Additionally, when these same three PA parcels were used in the one-factor model using the latent factor distress, the results were very different with the two PA parcels with previous negative factor loadings having positive loadings and the previously positively loaded parcel having a negative factor loading. Additionally, the three item parcels generated from items from the RADS and RCMAS (which in the case of PA, all came from the RADS) were associated with positive factor loadings for PA. For the data from the RADS and RCMAS three PA item parcels were generated from six items, each of which was positively correlated with the others. The three item parcels from the MACI, RADS, and RCMAS were generated from 11 items. Of particular interest are the correlations among those items. Again, the six items from the RADS and RCMAS associated with PA were positively correlated with each other; however, the five items from the MACI were negatively correlated with almost all of the other items (in one instance there was no correlation). These MACI items included content that appears to be related to self-esteem, self-efficacy, and positive self-evaluation, such as "I make friends easily," "Almost anything I try comes easy to me," and "I'm very mature for my age and know what I want to do in life." Intuitively, it seems that these items should

have correlated with the PA items from the RADS, such as "I feel happy," "I feel like having fun," and "I feel important," but they did not.

For both the two- and three-factor models for the data from the MACI, RADS, and RCMAS, the correlation among the constructs was moderate to strong. For the two-factor model, 83% of the variance in NA could be accounted for by PA, while for the three-factor model the correlations among the constructs of NA and PA, NA and PH, and PA and PH accounted for 87%, 88%, and 88% of the variance, respectively. Correlations such as these suggest that the measurement of these constructs may not have been independent of each other. It is possible that this was created by the improper assignment of items to a particular construct, or by some shared higher-order factor that might be common to the constructs. In some cases, it appeared that the wording of items (positive or negative) impacted their assignment (or them being dropped from the construct scales) more than the actual content. For example, the MACI item, "Very few things or activities seem to give me pleasure," was rated by half the respondents as assessing NA, while the other half rated it as assessing PA and it was therefore not included.

Another plausible explanation for the lack of support for the two- and three-factor of affect, may be related to possible weaknesses in the model itself. The majority of the studies demonstrating support for the tripartite model in youth have utilized the RCMAS (73.68%), and CDI (68.42%). The next most frequently used measures associated with these studies are the PANAS, PANAS-X, and PANAS-C (36.84%). The two- and three-factor models associated with the tripartite model may be dependent on the items included within the measures. The RCMAS and CDI include items such as "I worry at lot of the time" (RCMAS item 6) and "I have fun in many things/I have fun in some things/Nothing is fun at all" (CDI item 4). The content of items from the CDI is similar to

those from the RADS which was used in the current study. The PANAS and its variants ask the respondent to rate their agreement with a series of adjectives such as "happy" and "sad." It seems that the inclusion of items that are potentially more complex or compound such as the MACI items, "I guess I'm a complainer who expects the worst to happen" and "I'm very mature for my age and know what I want to do in life," may not contribute to the models in the same way.

Several previous studies examining the structure of affect have reported difficulties in regards to model fit when utilizing measures other than the RCMAS, CDI, and PANAS (Chorpita et al., 1998; Cole et al., 1997). For example, Cole and colleagues found differences in the structure of anxiety and depression based on both the method used to assess symptomatology as well as the respondent who provided the information. Chorpita and colleagues found that they could not use CBCL parent scales in model testing because, although they were theoretically supported, they manifested empirical underidentification in some of the models.

Findings Related to the Use of a Clinical Sample

The current study employed a large sample of psychiatrically hospitalized adolescents. Previous studies had used smaller samples and had combined children and adolescents into a single sample. The results of the current study with the identification of a two-factor model consistent with the tripartite model is somewhat at odds with the findings of Joiner and colleagues (1996) and Chorpita and colleagues (1998), both of which identified three-factor models as models that best described the structure of affect in clinical samples of children and adolescents (the first study used psychiatric inpatients, while the second used clinically referred participants with anxiety or anxiety and comorbid diagnoses). Interestingly, Chorpita and colleagues (2000)

evaluated both two- and three-factor models and determined that neither provided a parsimonious model to their data from the CDI, RCMAS, and Anxiety Disorder Interview Schedule for clinically referred youth. Yet they did find support for the constructs NA and PA as distinguishing depressive and anxiety disorders. These findings are similar to the current study, where the model fit for both the two- and three- factor models based on the RADS and RCMAS provided similar fit, and the constructs of NA and PA were effective in describing depression and anxiety. Similarly, Lonigan and colleagues (1994) examined the structure of NA in children using a clinical sample of children admitted to an inpatient psychiatric unit using data from the CDI and RCMAS. They concluded that a general negative affectivity component was common to both anxiety and depression and that depressed children reported more problems related to loss of interest, low motivation, and negative self-view (the polar opposites of PA) suggesting that PA may help distinguish between depression and anxiety. Again these findings are consistent with the current finding that the depressive and anxiety diagnostic groups demonstrated no statistically significant differences in NA, while the anxiety diagnostic group demonstrated significantly higher levels of PA than the depressive group.

Overall, the current results suggest that NA and PA have utility in distinguishing depression and anxiety, particularly based on data from the RADS and RCMAS. Specifically, it appears that we are able to best assess distress in the form of negative affect. We are also able to adequately assess positive affect based on the RADS and RCMAS. Once items from the MACI are included, it appears PA is less well-defined, suggesting the need for further study. Finally, regardless of which set of items was used, PH, continues to be more problematic. Whereas, there was some support for PH from model testing for the data from the RADS and RCMAS for the entire sample, it was not supported in tests of model invariance. The addition of MACI items did not provide

support for PH, so support for the construct is equivocal. It is unclear whether this is related to the construct itself or to the inadequacy of the measures in assessing the construct.

Clinical and Research Implications

The finding that it was not possible to generate any model of acceptable fit to the data from the MACI, RADS, and RCMAS while it was possible to generate a model of good fit from the RADS and RCMAS highlights an issue not previously a focus in the tripartite literature. Is our understanding of the structure of affect based on the measures we have used to previously assess it, or is it reflective of the true structure of depression and anxiety? Although there are a number of instruments designed to assess depressive and anxious symptoms in youth, only a select few have been used in examinations of the structure of affect. Although both the current and previous research has demonstrated the role of NA and PA in the structure of affect and their utility in distinguishing depression and anxiety, there is not yet unequivocal support (or lack of) for the construct of PH. Many previous researchers had pointed out that this may be due to the lack of adequate measurement strategies for the construct. There exists the possibility that the construct does not play a role or that we have yet to identify a means of accurately assessing the construct. The current study through the unsuccessful model fitting to the data from the MACI, RADS, and RCMAS, elucidates that our understanding of the tripartite model may be dependent on the measures previously used to study it. At the current time, it is unclear whether other factors, that have yet to be identified, might be involved in better describing the structure of affect, and these factors might be measured through the use of other measures of depression and anxiety. These issues demonstrate that collecting more data, by having participants

complete more measures, is not necessarily helpful in understanding the structure of affect, especially if the data do not provide information that is reliably related to the constructs of interest. While the current study provides evidence that PA may be a key feature in distinguishing depression from anxiety, there is still a need to gain a more complete understanding of the structure of affect, particularly the role of PH and any higher order factors that may play a role.

Limitations of the Study

Obviously, there are several limitations to the current study. The first relates to sample size. While the study employed a large clinical sample of adolescents, the sample size was not adequate in a number of ways. While each of the subjects included in the study completed the RADS and RCMAS, fewer than half of the subjects completed the MACI, RADS, and RCMAS. The simultaneous increase in the number of items included in item parcels and decrease in the number of subjects, suggests that the results for the data from the MACI, RADS, and RCMAS may be less stable and more impacted by sampling idiosyncrasies than that from the RADS and RCMAS. Although this sample represents a comparatively large clinical sample relative to previous studies, it did not include an adequate number of subjects falling into the anxious diagnostic group to allow multigroup tests of model invariance to include an anxious sample. Given that the participants were from an inpatient hospital setting, it is not surprising that adolescents with anxiety disorders were not well represented. While anxiety symptoms may have significant impact on the affected individual, those symptoms alone are not likely to lead to hospitalization. Most often, youth are hospitalized due to risk of harm to self or others or an inability to stabilize and/or manage their symptoms on an outpatient basis. Additionally, since the majority of subjects fell into the depressive diagnostic

group category, it is likely that the models of best fit were more representative of the data from adolescents with depressive diagnoses, than those with anxiety, comorbid depression and anxiety, or other diagnoses. While the models appear invariant, replication of the findings, particularly for adolescents with diagnoses other than depression, will add to our confidence in the findings.

Another limitation of this study was the limited geographic area sampled, potentially limiting the ability to generalize the results to a larger population. Additionally, the sample was mostly Caucasian and of low and lower-middle socioeconomic status. Thus, while the results may be generalized to adolescents living in similar communities, they may not generalize to more diverse populations of adolescents or those living in areas other than the Midwest.

The timing of assessment may present yet another limitation of the study. Participants completed the measures of interest within 7 days of admission to the hospital. While some participants completed the measures at the time of admission, others did not complete the measures until day 6 or 7 of hospitalization. Participants who completed the measures at the time of admission probably reported higher levels of distress and greater severity of symptoms than they would had they completed the measures later in their hospitalization when the potential effects of therapy and medication may have decreased their symptomatology. It is likely that the participants who were most distressed were permitted to defer completion of the assessments to later in their hospitalization relative to those who were less distressed, thereby lowering the level of symptomatology reported. If all participants were required to complete measures at the time of admission, the results probably would not differ in regards to model structure, however, they might indicate higher levels of symptomatology associated with (NA, PH) and lower levels of positive affect, as well as larger between

diagnostic group differences on these scales. While it was assumed that the vast majority of participants were receiving pharmacological intervention, no data were collected related to this variable. It is possible that differences in medication may have also impacted the symptomatology reported by the participants. However, these differences in reported symptomatology most likely are related to the severity of symptoms as opposed to the absence or presence of particular types of symptoms.

Additionally, the methods used for providing chart diagnoses for each of the participants may have created a limitation. For about three quarters of the participants, the diagnosis was provided based on information obtained from a semistructured interview conducted by a psychiatrist or residents supervised by the psychiatrist, as well as from other input from members of the multidisciplinary team. For the other 25% of participants, the diagnosis was based on a data from a structured interview in addition to the aforementioned methods. It would be preferable if each diagnosis was based on the same structured interview, potentially increasing the reliability of the diagnoses.

The manner in which the construct scales for NA, PA, and PH were created poses a potential limitation. A panel of psychologists and advanced psychology graduate students, with content knowledge related to the tripartite model, were asked to independently assign each of the items from the MACI, RADS, and RCMAS to categories based on whether they measured NA, PA, PH, or none of the constructs. Only items with 80% agreement were included in the item pool. While there were differences in the way raters assigned the items to constructs, the requirement of 80% agreement was used in an attempt to control for potential errors in assignment. While this does not prevent all errors, the issue seems unavoidable. The selected items were then assigned to parcels of between two and five items, using statistically based and content-driven approaches, with the statistically generated item parcels being used for

the analyses. However, the statistically generated parcels used may not represent the best possible approach to handling the items. Although Schallow (2000) compared random assignment, high mutual correlation, and judged similar content of items as methods for combining items into item parcels and found that method made little difference in the final model fit, other studies have found that assignment methodology in fact does make a difference in regards to model fit. Hall and colleagues (1999) supported combining items that share a secondary factor into parcels based on either factor analysis or the rational approaches, with the caveat that it is important to be aware of possible contamination of secondary factor influences. This may be of particular importance in considering the data from the MACI (or other novel measures) where secondary factor influences are suspected. These possible secondary influences have yet to be identified, but may be related to NA, PA, and PH, or depression and anxiety. Other researchers have concluded that combining items into parcels resulted in better fit indices than using individual items, but that the same methods resulted in more nonconvergent solutions and more Heywood cases, where the estimated error term for an indicator of a latent variable is negative and therefore nonsensical, than using individual items (Nasser & Wisenbaker, 2003). The current research generated several inadmissible solutions for the diagnostic group samples related to Heywood cases. The construction of item parcels is a researcher decision and regardless of how they are constructed, always poses a potential limitation. An examination of model fit based on either individual items or other arrangements of items into item parcels, may have yielded different results and could be examined in future research.

Finally, the current study used only self-report data for examining the structure of affect. Reliance solely on self-report data may be problematic for two reasons. First, participants may have chosen to respond to the questions in a manner that would make

them appear in either a positive or negative light. Second, some of the participants were asked to respond to a large number of assessment instruments (some participants completed assessments beyond the MACI, RADS, and RCMAS), some of which where quite lengthy. In some cases, participants responded to over 600 items. Concerns related to the validity, particularly the internal consistency, of the responses are reasonable. Given that extant data was used for this study, this problem was unavoidable; however, having participants respond to only items of interest could decrease this concern related to internal consistency. Furthermore, utilizing multiple self-report measures such as clinical interview data and multiple specifically targeted self-report measures (items focusing solely on the constructs of interest) could help obtain more accurate and reliable results.

Directions for Future Research

There are several ways future researchers can build on this study. Recommendations for future research include the above-mentioned need for a larger and more diagnostically representative clinical sample (approximately equal numbers of participants with depressive, anxious, comorbid depressive and anxious diagnoses), as well as a sample that is more geographically and socioeconomically diverse. These strategies would serve to increase the generalizability of the findings. Other areas for future study might include examining whether the structure of affect is invariant for males and females and whether chronicity of problems impacts the structure of affect (model invariance for groups of participants being admitted for psychiatric hospitalization for the first time and for groups with multiple psychiatric hospitalizations).

While the current research provides its support for the two-factor model of NA and PA consistent with the tripartite model using data from the RADS and RCMAS for

the overall sample and each of the diagnostic groups, the three-factor model of NA, PA, and PH generated similarly good fit to the data for the overall sample and the depressive and other diagnostic groups. Models could not be tested for the anxiety diagnostic group for the data from the RADS and RCMAS or the MACI, RADS, and RCMAS. Replicating the current research with larger diagnostic subsamples might serve to provide greater understanding of potential across diagnostic group differences or similarities in the structure of affect.

Replicating the current study and having all participants complete the MACI, RADS, and RCMAS, might provide a clearer picture of the current model, as would replicating the study with other, yet unused measures for assessing depression and anxiety, or general psychopathology. Additionally, examining the model for additional higher-order factors that may play a role in describing the structure of affect might provide useful information about the relationship between the indicators and latent constructs, and also among the constructs themselves.

Additional important information related to the structure of affect might be obtained as the result of research utilizing methods other than self-report to obtain information about symptomatology. Using multiple sources may help to provide a more complete picture of the symptomatology associated with the structure of affect. Inclusion of respondents other than the adolescent completing a self report measure may elucidate as yet unrecognized factors contributing to the structure of affect. Additionally, the identification and use of other measures designed to assess depressive and anxious symptomatology may also have utility in developing a clearer picture of the structure of affect and it's underlying constructs of NA, PA, and PH, and any higher-order constructs that may also be involved.

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APPENDICES

Appendix A:

Item-Rating Packet

Tripartite Model Construct Definitions

NA: Negative affectivity refers to an individual's subjective self report of feeling upset or unpleasantly aroused. This global emotional distress subsumes a wide range of negative mood states including anger, disgust, dissatisfaction, fear, gloominess, guilt, hostility, loneliness, misery, nervousness, sadness, and worry. Conversely, individuals who endorse low levels of NA are described as calm, placid, serene, and relaxed.

PA: Positive affectivity refers to an individual's subjective experiences of interest, emotionality, engagement, and energy. Individuals with high degrees of positive affectivity are described as active, adventurous, alert, cheerful, determined, energetic, enthusiastic, excited, happy, interested, joyful, lively, and proud. In contrast, individuals endorsing low levels of PA are described as blunted, drowsy, fatigued, lethargic, sluggish, somnolent, sullen, and weary.

PH: Physiological hyperarousal refers to symptoms associated with autonomic arousal, also described as somatic tension and hyperarousal. Specific symptoms include stomach discomfort, difficulty breathing, dizziness, dry mouth, excessive perspiration, nausea, racing heart, shakiness, shortness of breath, sweaty palms, and trembling. Individuals with high level of PH may also report symptoms such as being tired or fatigued, having sleep difficulties, and feeling restless or having difficulty sitting still.

Please indicate your professional status: ☐ graduate student ☐ Ph.D. psychologist

MACI, RADS, and RCMAS Items for Consideration As Contributing to NA, PA, or PH

ITEM	other	NA	PA	PH
1. I would much rather follow someone than be the leader				
2. I'm pretty sure I know who I am and what I want in life.				
3. I don't need to have close friendships like other kids do.				
4. I often resent doing things others expect of me.				
5. I do my very best not to hurt people's feelings.				
6. I can depend on my parents to be understanding of me.				
7. Some people think of me as a bit conceited.				
8. I would never use drugs, no matter what.				
9. I always try to do what is proper.				
10. I like the way I look.				
11. Although I go on eating binges, I hate the weight I gain.				
12. Nothing much that happens seems to make me either happy or sad.				
13. I seem to have a problem getting along with other teenagers.				
14. I feel pretty shy telling people about how I was abused as a child.				
15. I've never done anything for which I could have been arrested.				
16. I think everyone would be better off if I were dead.				
17. Sometimes, when I'm away from home, I begin to feel tense and panicky.				
18. I usually act quickly, without thinking				
19. I guess I'm a complainer who expects the worst to happen.				
20. It is not unusual to feel lonely and unwanted.				
21. Punishment never stopped me from doing whatever I wanted.				
22. Drinking seems to have been a problem for several members of my family				
23. I like to follow instructions and do what others expect of me.				
24. I seem to fit in right away with any group of new kids I meet.				
25. So little of what I have done has been appreciated by others.				
26. I hate the fact that I don't have the looks or brains I wish I had.				
27. I like it at home.				
28. I sometimes scare other kids to get them to do what I want.				
29. Although people tell me I'm thin, I still feel overweight.				

30. When I have a few drinks I feel more sure of myself.				
31. Most people are better looking than I am.				
32. I often fear I'm going to panic or faint when I'm in a crowd.				
33. I sometimes force myself to vomit after eating a lot.				
34. I often feel as if I'm floating around, sort of lost in life.				
35. Most other teenagers don't seem to like me.				
36. When I have a choice, I prefer to do things alone.				
37. Becoming involved in other people's problems is a waste of time.				
38. I often feel that others do not want to be friendly to me				
39. I don't care much what other kids think of me.				
40. I used to get so stoned that I did not know what I was doing.				
41. I don't mind telling people something they won't like hearing.				
42. I see myself as falling far short of what I'd like to be.				
43. Things in my life just go from bad to worse.				
44. As soon as I get the impulse to do something, I act on it.				
45. I've never been called a juvenile delinquent.				
46. I'm often my own worst enemy.				
47. Very few things or activities seem to give me pleasure.				
48. I always think of dieting, even when people say I'm underweight.				
49. I find it hard to feel sorry for people who are always worried about things.				
50. It is good to have a routine for doing most things.				
51. I don't think I have as much interest in sex as others my age.				
52. I don't see anything wrong with using others to get what I want.				
53. I would rather be almost anyplace but home.				
54. I sometimes get so upset that I want to hurt myself seriously.				
55. I don't think I was sexually molested when I was a young child.				
56. I am a dramatic and showy sort of person.				
57. I can hold my beer or liquor better than most of my friends.				
58. Parents and teachers are too hard on kids who don't follow rules.				
59. I like to flirt a lot.				
60. To see someone suffering doesn't bother me.				
61. I don't seem to have much feeling for others.				
62. I enjoy thinking about sex.				
63. I worry a great deal about being left alone.				
64. I often feel sad and unloved.				

65. I'm supposed to be thin, but I feel my thighs and backside are much too big.				
66. I often deserve it when others put me down.				
67. People put pressure on me to do more than is fair.				
68. I think I have a good body.				
69. I feel left out of things socially.				
70. I make friends easily.				
71. I'm a somewhat scared and anxious person.				
72. I hate to think about some of the ways I was abused as a child.				
73. I'm no different from lots of kids who steal things now and then.				
74. I prefer to act first and think about it later.				
75. I've gone through periods when I smoke pot several times a week.				
76. Too many rules get in the way of my doing what I want.				
77. When things get boring, I like to stir up some excitement.				
78. I will sometimes do something cruel to make someone unhappy.				
79. I spend a lot of time worrying about my future.				
80. I often feel I'm not worthy of the nice things in my life.				
81. I sort of feel sad when I see someone who's lonely.				
82. I eat little in front of others; then I stuff myself in private.				
83. My family is always yelling and fighting.				
84. I sometimes feel very unhappy with who I am.				
85. I don't seem to enjoy being with people.				
86. I have talents that other kids wish they had.				
87. I'm very uncomfortable with people unless I'm sure they really like me.				
88. Killing myself may be the easiest way of solving my problems.				
89. I sometimes get confused or upset when people are nice to me.				
90. Drinking really seems to help me when I'm feeling down.				
91. I rarely look forward to anything with much pleasure.				
92. I'm very good at making up excuses to get out of trouble.				
93. It is very important that children learn to obey their elders.				
94. Sex is enjoyable.				
95. No one really cares if I live or die.				
96. We should respect our elders and not think we know better.				
97. I sometimes get pleasure by hurting someone physically.				

98. I often feel lousy after something good has happened to me.				
99. I don't think people see me as an attractive person.				
100. Socially, I'm a loner and I don't mind it.				
101. Almost anything I try comes easy to me.				
102. There are times when I feel that I'm a much younger person than I actually am.				
103. I like being the center of attention.				
104. If I want to do something, I just do it without thinking of what might happen.				
105. I'm terribly afraid that no matter how thin I get, I will start to gain weight if I eat.				
106. I won't get close to people because I'm afraid they may make fun of me.				
107. More and more often I have thought of ending my life.				
108. I sometimes put myself down just to make someone else feel better.				
109. I get very frightened when I think of being all alone in the world.				
110. Good things just don't last.				
111. I've had a few run-ins with the law.				
112. I'd like to trade bodies with someone else.				
113. There are many times when I wish I were much younger again.				
114. I have not seen a car in the last ten years.				
115. Other people my age seem more sure than I am of who they are and what they want.				
116. Thinking about sex confuses me much of the time.				
117. I do what I want without worrying about its effect on others.				
118. Lots of things that look good today will turn out bad later.				
119. Others my age never seem to call me to get together with them.				
120. There have been times when I could not get through the day without some pot.				
121. I make my life worse than it has to be.				
122. I prefer being told what to do rather than having to decide for myself.				
123. I have tried to commit suicide in the past.				
124. I go on eating binges a couple of times a week.				
125. Lately, little things seem to depress me.				
126. I flew across the Atlantic 30 times last year.				
127. There are times I wish I were someone else.				
128. I don't mind pushing people around to show my power.				
129. I'm ashamed of some terrible things adults did to me when I was young.				
130. I try to make everything I do as perfect as possible.				

131. I am pleased with the way my body has developed.				
132. I often get frightened when I think of the things I have to do.				
133. Lately, I feel jumpy and nervous almost all the time.				
134. I used to try hard drugs to see what effect they'd have.				
135. I can charm people into giving me almost anything I want.				
136. Many other kids get breaks I don't get.				
137. People did things to me sexually when I was too young to understand.				
138. I often keep eating to the point that I feel sick.				
139. I will make fun of someone in a group just to put them down.				
140. I don't like being the person I've become.				
141. I seem to make a mess of the good things that come my way.				
142. Although I want to have friends, I have almost none.				
143. I am glad that feeling about sex have become a part of my life now.				
144. I'm willing to starve myself to be even thinner than I am.				
145. I'm very mature for my age and know what I want to do in life.				
146. In many ways I feel very superior to most people.				
147. My future seems hopeless.				
148. My parents have had a hard time keeping me in line.				
149. When I don't get my way, I quickly lose my temper.				
150. I often have fun doing certain unlawful things.				
151. I guess I depend too much on other to be helpful to me.				
152. When we're having a good time, my friends and I can get pretty drunk.				
153. I feel lonely and empty most of the time.				
154. I feel pretty aimless and don't know where I'm going.				
155. Telling lies is a pretty normal thing to do.				
156. I've given thought to how and when I might commit suicide.				
157. I enjoy starting fights.				
158. There are times when nobody at home seems to care about me.				
159. It is good to have a regular way of doing things as to avoid mistakes.				
160. I probably deserve many of the problems I have.				
1. I have trouble making up my mind.				
2. I get nervous when things do not go the right way for me.				
3. Others seem to do things easier than I can.				
5. Often I have trouble getting my breath.				

6. I worry a lot of the time.				
7. I am afraid of a lot of things				
9. I get mad easily.				
10. I worry about what my parents will say to me.				
11. I feel that others do not like the way I do things.				
13. It is hard for me to get to sleep at night.				
14. I worry about what other people think about me.				
15. I feel alone even when there are people with me.				
17. Often I feel sick in my stomach.				
18. My feelings get hurt easily.				
19. My hands feel sweaty.				
21. I am tired a lot.				
22. I worry about what is going to happen.				
23. Other people are happier than I.				
25. I have bad dreams.				
26. My feelings get hurt easily when I am fussed at.				
27. I feel someone will tell me I do things the wrong way.				
29. I wake up scared some of the time.				
30. I worry when I go to bed at night.				
31. It is hard for me to keep my mind on my schoolwork.				
33. I wiggle in my seat a lot.				
34. I am nervous.				
35. A lot of people are against me.				
37. I often worry about something bad happening to me.				
1. I feel happy.				
2. I worry about school.				
3. I feel lonely.				
4. I feel my parents don't like me.				
5. I feel important.				
6. I feel like hiding from people.				
7. I feel sad.				
8. I feel like crying.				
9. I feel that no one cares about me.				
10. I feel like having fun with other students.				
11. I feel sick.				
12. I feel loved.				
13. I feel like running away.				
14. I feel like hurting myself.				
15. I feel that other students don't like me.				
16. I feel upset.				
17. I feel that life is unfair.				
18. I feel tired.				
19. I feel I am bad.				
20. I feel I am no good.				
21. I feel sorry for myself.				
22. I feel mad about things.				
23. I feel like talking to other students.				
24. I have trouble sleeping.				
25. I feel like having fun.				

26. I feel worried.				
27. I get stomachaches.				
28. I feel bored.				
29. I like eating meals				
30. I feel like nothing I do helps any more.				

Appendix B:

Item Ratings

Please indicate your professional status: 41.7% graduate student 58.3% Ph.D. psychologist

MACI, RADS, and RCMAS Items Contributing to NA, PA, or PH

ITEM	other	NA	PA	PH
1. I would much rather follow someone than be the leader	66.7	25.0	8.3	
2. I'm pretty sure I know who I am and what I want in life.	25.0		75.0	
3. I don't need to have close friendships like other kids do.	75.0	25.0		
4. I often resent doing things others expect of me.	25.0	75.0		
5. I do my very best not to hurt people's feelings.	66.7	16.7	16.7	
6. I can depend on my parents to be understanding of me.	41.7		58.3	
7. Some people think of me as a bit conceited.	58.3	16.7	25.0	
8. I would never use drugs, no matter what.	75.0	8.3	16.7	
9. I always try to do what is proper.	58.3	16.7	16.7	8.3
10. I like the way I look.	8.3	8.3	**83.3**	
11. Although I go on eating binges, I hate the weight I gain.	41.7	58.3		
12. Nothing much that happens seems to make me either happy or sad.	16.7	41.7	41.7	
13. I seem to have a problem getting along with other teenagers.	25.0	66.7	8.3	
14. I feel pretty shy telling people about how I was abused as a child.	41.7	50.0		8.3
15. I've never done anything for which I could have been arrested.	83.3		16.7	
16. I think everyone would be better off if I were dead.		**100.0**		
17. Sometimes, when I'm away from home, I begin to feel tense and panicky.	8.3	8.3		**83.3**
18. I usually act quickly, without thinking	66.7	16.7	8.3	8.3
19. I guess I'm a complainer who expects the worst to happen.	16.7	**83.3**		
20. It is not unusual to feel lonely and unwanted.	8.3	**91.7**		
21. Punishment never stopped me from doing whatever I wanted.	66.7	16.7	8.3	8.3
22. Drinking seems to have been a problem for several members of my family	83.3	8.3		8.3
23. I like to follow instructions and do what others expect of me.	58.3		25.0	16.7
24. I seem to fit in right away with any group of new kids I meet.	16.7		**83.3**	
25. So little of what I have done has been appreciated by others.	8.3	**91.7**		
26. I hate the fact that I don't have the looks or brains I wish I had.	8.3	**91.7**		
27. I like it at home.	33.3		66.7	
28. I sometimes scare other kids to get them to do what I want.	66.7	33.3		
29. Although people tell me I'm thin, I still feel overweight.	33.3	66.7		
30. When I have a few drinks I feel more sure of myself.	66.7	25.0	8.3	
31. Most people are better looking than I am.	16.7	**83.3**		
32. I often fear I'm going to panic or faint when I'm in a crowd.	8.3	8.3		**83.3**
33. I sometimes force myself to vomit after eating a lot.	50.0	41.7		8.3
34. I often feel as if I'm floating around, sort of lost in life.	41.7	50.0		8.3
35. Most other teenagers don't seem to like me.	16.7	**83.3**		
36. When I have a choice, I prefer to do things alone.	91.7	8.3		
37. Becoming involved in other people's problems is a waste of time.	66.7	25.0	8.3	
38. I often feel that others do not want to be friendly to me	16.7	75.0	8.3	
39. I don't care much what other kids think of me.	75.0	16.7	8.3	
40. I used to get so stoned that I did not know what I was doing.	83.3	16.7		
41. I don't mind telling people something they won't like hearing.	83.3	16.7		
42. I see myself as falling far short of what I'd like to be.	75.0	25.0		
43. Things in my life just go from bad to worse.	8.3	**91.7**		
44. As soon as I get the impulse to do something, I act on it.	58.3	8.3	8.3	25.0
45. I've never been called a juvenile delinquent.	75.0		25.0	
46. I'm often my own worst enemy.	25.0	75.0		
47. Very few things or activities seem to give me pleasure.		66.7	33.3	
48. I always think of dieting, even when people say I'm underweight.	50.0	50.0		

49. I find it hard to feel sorry for people who are always worried about things.	75.0	16.7	8.3	
50. It is good to have a routine for doing most things.	66.7	25.0	8.3	
51. I don't think I have as much interest in sex as others my age.	41.7	33.3	16.7	8.3
52. I don't see anything wrong with using others to get what I want.	75.0	16.7	8.3	
53. I would rather be almost anyplace but home.	50.0	50.0		
54. I sometimes get so upset that I want to hurt myself seriously.		**91.7**		8.3
55. I don't think I was sexually molested when I was a young child.	91.7	8.3		
56. I am a dramatic and showy sort of person.	41.7	8.3	33.3	16.7
57. I can hold my beer or liquor better than most of my friends.	**91.7**		8.3	
58. Parents and teachers are too hard on kids who don't follow rules.	75.0	25.0		
59. I like to flirt a lot.	41.7		50.0	8.3
60. To see someone suffering doesn't bother me.	75.0	25.0		
61. I don't seem to have much feeling for others.	66.7	33.3		
62. I enjoy thinking about sex.	58.3		33.3	8.3
63. I worry a great deal about being left alone.		**91.7**		8.3
64. I often feel sad and unloved.		**100.0**		
65. I'm supposed to be thin, but I feel my thighs and backside are much too big/	50.0	50.0		
66. I often deserve it when others put me down.		**100.0**		
67. People put pressure on me to do more than is fair.	33.3	66.7		
68. I think I have a good body.	25.0		75.0	
69. I feel left out of things socially.	16.7	75.0	8.3	
70. I make friends easily.	16.7		**83.3**	
71. I'm a somewhat scared and anxious person.		75.0		25.0
72. I hate to think about some of the ways I was abused as a child.	58.3	41.7		
73. I'm no different from lots of kids who steal things now and then.	83.3	8.3	8.3	
74. I prefer to act first and think about it later.	66.7	8.3	16.7	8.3
75. I've gone through periods when I smoke pot several times a week.	91.7	8.3		
76. Too many rules get in the way of my doing what I want.	75.0	16.7	8.3	
77. When things get boring, I like to stir up some excitement.	75.0		25.0	
78. I will sometimes do something cruel to make someone unhappy.	75.0	25.0		
79. I spend a lot of time worrying about my future.		**91.7**		8.3
80. I often feel I'm not worthy of the nice things in my life.		**100.0**		
81. I sort of feel sad when I see someone who's lonely.	41.7	50.0	8.3	
82. I eat little in front of others; then I stuff myself in private.	50.0	41.7		8.3
83. My family is always yelling and fighting.	41.7	58.3		
84. I sometimes feel very unhappy with who I am.		**100.0**		
85. I don't seem to enjoy being with people.	8.3	75.0	16.7	
86. I have talents that other kids wish they had.	25.0		75.0	
87. I'm very uncomfortable with people unless I'm sure they really like me.	41.7	58.3		
88. Killing myself may be the easiest way of solving my problems.	25.0	75.0		
89. I sometimes get confused or upset when people are nice to me.	41.7	58.3		
90. Drinking really seems to help me when I'm feeling down.	66.7	25.0		8.3
91. I rarely look forward to anything with much pleasure.		**83.3**	16.7	
92. I'm very good at making up excuses to get out of trouble.	83.3	8.3	8.3	
93. It is very important that children learn to obey their elders.	75.0		16.7	8.3
94. Sex is enjoyable.	33.3		66.7	
95. No one really cares if I live or die.		**100.0**		
96. We should respect our elders and not think we know better.	75.0		16.7	8.3
97. I sometimes get pleasure by hurting someone physically.	66.7	33.3		
98. I often feel lousy after something good has happened to me.		**83.3**	8.3	8.3
99. I don't think people see me as an attractive person.	16.7	**83.3**		
100. Socially, I'm a loner and I don't mind it.	58.3	8.3	33.3	
101. Almost anything I try comes easy to me.	16.7		**83.3**	

102. There are times when I feel that I'm a much younger person than I actually am.	66.7	8.3	25.0	
103. I like being the center of attention.	50.0		50.0	
104. If I want to do something, I just do it without thinking of what might happen.	75.0	8.3	8.3	8.3
105. I'm terribly afraid that no matter how thin I get, I will start to gain weight if I eat.	58.3	33.3		8.3
106. I won't get close to people because I'm afraid they may make fun of me.	25.0	75.0		
107. More and more often I have thought of ending my life.		**100.0**		
108. I sometimes put myself down just to make someone else feel better.	50.0	33.3	16.7	
109. I get very frightened when I think of being all alone in the world.		**91.7**		8.3
110. Good things just don't last.	16.7	**83.3**		
111. I've had a few run-ins with the law.	91.7	8.3		
112. I'd like to trade bodies with someone else.	33.3	66.7		
113. There are many times when I wish I were much younger again.	58.3	41.7		
114. I have not seen a car in the last ten years.	91.7	8.3		
115. Other people my age seem more sure than I am of who they are and what they want.	33.3	66.7		
116. Thinking about sex confuses me much of the time.	50.0	41.7	8.3	
117. I do what I want without worrying about its effect on others.	75.0	25.0		
118. Lots of things that look good today will turn out bad later.	25.0	75.0		
119. Others my age never seem to call me to get together with them.	41.7	58.3		
120. There have been times when I could not get through the day without some pot.	50.0	41.7		8.3
121. I make my life worse than it has to be.	16.7	**83.3**		
122. I prefer being told what to do rather than having to decide for myself.	66.7	25.0		8.3
123. I have tried to commit suicide in the past.	33.3	66.7		
124. I go on eating binges a couple of times a week.	58.3	33.3		8.3
125. Lately, little things seem to depress me.	8.3	**91.7**		
126. I flew across the Atlantic 30 times last year.	83.3	8.3	8.3	
127. There are times I wish I were someone else.	8.3	**91.7**		
128. I don't mind pushing people around to show my power.	66.7	25.0	8.3	
129. I'm ashamed of some terrible things adults did to me when I was young.	33.3	66.7		
130. I try to make everything I do as perfect as possible.	58.3	25.0	8.3	8.3
131. I am pleased with the way my body has developed.	33.3		66.7	
132. I often get frightened when I think of the things I have to do.	8.3	75.0		16.7
133. Lately, I feel jumpy and nervous almost all the time.	16.7	25.0		58.3
134. I used to try hard drugs to see what effect they'd have.	83.3		8.3	8.3
135. I can charm people into giving me almost anything I want.	83.3		16.7	
136. Many other kids get breaks I don't get.	41.7	50.0	8.3	
137. People did things to me sexually when I was too young to understand.	75.0	25.0		
138. I often keep eating to the point that I feel sick.	58.3	25.0		16.7
139. I will make fun of someone in a group just to put them down.	66.7	33.3		
140. I don't like being the person I've become.		**100.0**		
141. I seem to make a mess of the good things that come my way.	16.7	**83.3**		
142. Although I want to have friends, I have almost none.	16.7	**83.3**		
143. I am glad that feeling about sex have become a part of my life now.	41.7		58.3	
144. I'm willing to starve myself to be even thinner than I am.	41.7	58.3		
145. I'm very mature for my age and know what I want to do in life.	8.3		**91.7**	
146. In many ways I feel very superior to most people.	50.0		50.0	
147. My future seems hopeless.		**100.0**		
148. My parents have had a hard time keeping me in line.	75.0	16.7	8.3	

149. When I don't get my way, I quickly lose my temper.	33.3	58.3		8.3
150. I often have fun doing certain unlawful things.	75.0		25.0	
151. I guess I depend too much on other to be helpful to me.	33.3	58.3	8.3	
152. When we're having a good time, my friends and I can get pretty drunk.	83.3		16.7	
153. I feel lonely and empty most of the time.		**100.0**		
154. I feel pretty aimless and don't know where I'm going.	16.7	**83.3**		
155. Telling lies is a pretty normal thing to do.	91.7		8.3	
156. I've given thought to how and when I might commit suicide.	16.7	**83.3**		
157. I enjoy starting fights.	58.3	25.0	16.7	
158. There are times when nobody at home seems to care about me.	16.7	**83.3**		
159. It is good to have a regular way of doing things as to avoid mistakes.	66.7	8.3	16.7	8.3
160. I probably deserve many of the problems I have.		**100.0**		
1. I have trouble making up my mind.	41.7	58.3		
2. I get nervous when things do not go the right way for me.	8.3	58.3		33.3
3. Others seem to do things easier than I can.	33.3	66.7		
5. Often I have trouble getting my breath.				**100.0**
6. I worry a lot of the time.		**83.3**		16.7
7. I am afraid of a lot of things	8.3	66.7		25.0
9. I get mad easily.	8.3	**91.7**		
10. I worry about what my parents will say to me.	8.3	**83.3**		8.3
11. I feel that others do not like the way I do things.	16.7	**83.3**		
13. It is hard for me to get to sleep at night.				**100.0**
14. I worry about what other people think about me.	8.3	75.0		16.7
15. I feel alone even when there are people with me.		**100.0**		
17. Often I feel sick in my stomach.				**100.0**
18. My feelings get hurt easily.	16.7	**83.3**		
19. My hands feel sweaty.				**100.0**
21. I am tired a lot.	16.7	16.7		66.7
22. I worry about what is going to happen.		**91.7**		8.3
23. Other people are happier than I.	8.3	**83.3**	8.3	
25. I have bad dreams.	41.7	25.0		33.3
26. My feelings get hurt easily when I am fussed at.	8.3	**91.7**		
27. I feel someone will tell me I do things the wrong way.	16.7	75.0		8.3
29. I wake up scared some of the time.		41.7		58.3
30. I worry when I go to bed at night.		**83.3**		16.7
31. It is hard for me to keep my mind on my schoolwork.	50.0	33.3	8.3	8.3
33. I wiggle in my seat a lot.				**100.0**
34. I am nervous.	16.7	58.3		25.0
35. A lot of people are against me.	41.7	58.3		
37. I often worry about something bad happening to me.		**91.7**		8.3
1. I feel happy.			**100.0**	
2. I worry about school.		**91.7**	8.3	
3. I feel lonely.		**100.0**		
4. I feel my parents don't like me.	25.0	75.0		
5. I feel important.			**100.0**	
6. I feel like hiding from people.	16.7	**83.3**		
7. I feel sad.		**100.0**		
8. I feel like crying.		**91.7**		8.3
9. I feel that no one cares about me.		**100.0**		
10. I feel like having fun with other students.			**100.0**	
11. I feel sick.	8.3	8.3		**83.3**
12. I feel loved.		16.7	**83.3**	
13. I feel like running away.	25.0	58.3		16.7
14. I feel like hurting myself.	16.7	75.0		8.3
15. I feel that other students don't like me.	16.7	**83.3**		
16. I feel upset.		**100.0**		
17. I feel that life is unfair.	16.7	**83.3**		

18. I feel tired.	8.3	16.7		75.0
19. I feel I am bad.		**100.0**		
20. I feel I am no good.		**100.0**		
21. I feel sorry for myself.	8.3	**91.7**		
22. I feel mad about things.		**100.0**		
23. I feel like talking to other students.	16.7		**83.3**	
24. I have trouble sleeping.				**100.0**
25. I feel like having fun.			**100.0**	
26. I feel worried.		**91.7**		8.3
27. I get stomachaches.				**100.0**
28. I feel bored.	16.7	66.7	16.7	
29. I like eating meals	56.3		25.0	16.7
30. I feel like nothing I do helps any more.		**91.7**	8.3	

bold – item assigned to the construct (> 80% inter-rater agreement)

Appendix C:

Content-Based Item Parcels of RADS and RCMAS Items

Content-Based Item Parcels of RADS and RCMAS Items

Parcel	*Item*	*Source*	α
~~NA 1~~	I feel alone even when there are people with me	RCMAS 15	.725
	I feel lonely	RADS 3	
	I feel like hiding from people	RADS 6	
	I feel that other students don't like me	RADS 15	
NA 2	I feel that other do not like the way I do things	RCMAS 11	.699
	My feelings get hurt easily	RCMAS 18	
	My feelings get hurt easily when I am fussed at	RCMAS 26	
	I feel that no one care about me	RADS 9	
NA 3	Other people are happier than I	RCMAS 23	.555
	I feel that life is unfair	RADS 17	
	I feel sorry for myself	RADS 21	
NA 4	I feel I am bad	RADS 19	.738
	I feel I am no good	RADS 20	
	I feel like nothing I do helps any more	RADS 30	
NA 5	I feel sad	RADS 7	.315
	I feel like crying	RADS 8	
	I feel upset	RADS 16	
NA 6	I worry a lot of the time	RCMAS 6	.793
	I worry about what is going to happen	RCMAS 22	
	I worry when I go to bed at night	RCMAS 30	
	I feel worried	RADS 26	
NA 7	I worry about what my parents will say to me	RCMAS 10	.463
	I often worry about something bad happening to me	RCMAS 37	
	I worry about school	RADS 2	
NA 8	I get mad easily	RCMAS 9	.475
	I feel mad about things	RADS 22	
PA 1	I feel like having fun with other students	RADS 10	.824
	I feel like having fun	RADS 25	
PA 2	I feel important	RADS 5	.656
	I feel loved	RADS 12	
PA 3	I feel happy	RADS 1	.599
	I feel like talking to other students	RADS 23	
PH 1	Often I have trouble getting my breath	RCMAS 5	.694
	Often I feel sick in my stomach	RCMAS 17	
	I feel sick	RADS 11	
	I get stomachaches	RADS 27	
PH 2	It is hard for me to get to sleep at night	RCMAS 13	.838
	I have trouble sleeping	RADS 24	
PH 3	My hands feel sweaty	RCMAS 19	.329
	I wiggle in my seat a lot	RCMAS 33	

Appendix D:

Content-Based Item Parcels of MACI, RADS. and RCMAS Items

Content-Based Item Parcels of MACI, RADS, and RCMAS Items

Parcel	*Item*	*Source*	α
NA 1	Most other teenagers don't seem to like me	MACI 35	.739
	Although I want to have friends, I have almost none	MACI 142	
	My feelings get hurt easily	RCMAS 18	
	My feelings get hurt easily when I am fussed at	RCMAS 26	
	I feel like hiding from people	RADS 6	
	I feel that other students don't like me	RADS 15	
NA 2	So little of what I have done has been appreciated by others	MACI 25	.681
	No one really cares if I live or die	MACI 95	
	There are times when nobody at home seems to care about me	MACI 158	
	I feel that others do not like the way I do things	RCMAS 11	
	I feel that no one cares about me	RADS 9	
NA 3	There are times I wish I were someone else	MACI 127	.654
	Other people are happier than I	RCMAS 23	
	I feel that life is unfair	RADS 17	
	I feel sorry for myself	RADS 21	
NA 4	I guess I'm a complainer who expects the worst to happen	MACI 19	.710
	Things in life just go from bad to worse	MACI 43	
	Good things don't last	MACI 110	
NA 5	I often feel I'm not worthy of the nice things in my life	MACI 80	.698
	I rarely look forward to anything with much pleasure	MACI 91	
	I often feel lousy after something good has happened to me	MACI 98	
	Lately, little things seem to depress me	MACI 125	
NA 6	I sometimes feel very unhappy with who I am	MACI 84	.777
	I don't like the person I've become		
	I feel I am bad	MACI 140	
	I feel I am no good	RADS 19	
		RADS 20	
NA 7	I hate the fact that I don't have the looks or grains I wish I had	MACI 26	.780
	Most people are better looking than I am	MACI 31	
	I don't think people see me as an attractive person	MACI 99	
NA 8	I often deserve it when other put me down	MACI 66	.676
	I make my life worse than it has to be	MACI 121	
	I seem to make a mess of the good things that come my way	MACI 141	

	I probably deserve many of the problems I have	MACI 160	
NA 9	My future seems hopeless	MACI 147	.731
	I feel pretty aimless and don't know where I'm going	MACI 154	
	I feel like nothing I do helps any more	RADS 30	
NA 10	I often feel sad and unloved	MACI 64	.345
	I feel sad	RADS 7	
	I feel like crying	RADS 8	
	I feel upset	RADS 16	
NA 11	It is not unusual to feel lonely and unwanted	MACI 20	.738
	I feel lonely and empty most of the time	MACI 153	
	I feel alone even when there are people with me	RCMAS 15	
	I feel lonely	RADS 3	
NA 12	I spend a lot of time worrying about my future	MACI 79	.769
	I worry a lot of the time		
	I worry about what is going to happen	RCMAS 6	
	I worry when I go to bed at night	RCMAS 22	
	I feel worried	RCMAS 30	
		RADS 26	
NA 13	I worry a great deal about being left alone	MACI 63	.558
	I get frightened when I think of being all alone in the world	MACI 109	
	I worry about what my parents will say to me	RCMAS 10	
	I often worry about something bad happening to me	RCMAS 37	
	I worry about school		
		RADS 2	
NA 14	I think everyone would be better off if I were dead	MACI 16	.850
	I sometimes get so upset that I want to hurt myself seriously	MACI 54	
	More and more often I have thought of ending my life	MACI 107	
	I've given thought to how and when I might commit suicide	MACI 156	
NA 15	I get mad easily	RCMAS 9	.512
	I feel mad about things	RADS 22	
PA 1	I like the way I look	MACI 10	.377
	I make friends easily	MACI 70	
	Almost anything I try comes easy to me	MACI 101	
	I'm very mature for my age and know what I want to do in life.	MACI 145	
PA 2	I feel happy	RADS 1	.761
	I feel important	RADS 5	
	I feel loved	RADS 12	
	I feel like having fun	RADS 25	
PA 3	I seem to fit in with away with any group of	MACI 24	.227

	new kids I meet	MACI 70	
	I make friends easily	RADS 10	
	I feel like having fun with other students	RADS 23	
	I feel like talking to other students		
PH 1	Often I have trouble getting my breath	RCMAS 5	.702
	Often I feel sick in my stomach	RCMAS 17	
	I feel sick	RADS 11	
	I get stomachaches	RADS 27	
PH 2	It is hard for me to get to sleep at night	RCMAS 13	.808
	I have trouble sleeping	RADS 24	
PH 3	Sometimes when I'm away from home, I begin to feel tense and panicky	MACI 17	.411
	I often fear I'm going to panic or faint when I'm in a crowd	MACI 32	
PH 4	My hands feel sweaty	RCMAS 19	.307
	I wiggle in my seat a lot	RCMAS 33	

VITA

Marietta A. Veeder
1510 North 300 East
North Logan, Utah 84341
(435)787-2396/(435)770-0937
maveeder@cc.usu.edu

EDUCATION:

1999-present Candidate for Ph.D., Combined Clinical, Counseling, and School Psychology
APA Accredited Program
Utah State University
Logan, Utah
anticipated completion 12/2007

1998-1999 Ed.S. Community and Agency Counseling
Troy State University
Montgomery, Alabama

1992-1996 Candidate for Ed.S. Counseling, Completed 36 semester hours
New Mexico State University
Las Cruces, New Mexico

1986-1987 M.S. Psychology
Valdosta State University
Valdosta, Georgia

1979-1983 B.S. Psychology
University of Arizona
Tucson, Arizona

EMPLOYMENT EXPERIENCE:

9/2006-present **Designated Psychological Examiner**, Box Elder School District, Brigham City, Utah. Completed psychoeducational assessments and participated in the Individualized Education Plan (IEP) process for students in preschool through grade 12. Collaborated with teachers to develop educational and behavioral interventions for classroom implementation. Facilitated psychoeducational groups. Provided in-service trainings to teachers and special education staff related to specific student needs.

12/2001-present **Consultant**, WIRE/Worldwide Institute for Research and Evaluation and VDC/Van Dusen Consulting, Logan, Utah.
Participated as a member of teams conducting site visits on a variety of evaluation projects for programs offered by Junior Achievement and Junior Achievement Worldwide. Acted as project manger for the evaluations of Milton Hershey School Standards Implementation and several Junior Achievement and Junior Achievement Worldwide programs. Coordinated site visits, data collection, and entry. Completed data analysis and report writing.
Supervisor: Lani M. Van Dusen, Ph.D.

9/2005-8/2006 **Project Coordinator,** WIRE/Worldwide Institute for Research and Evaluation, Logan, Utah.
Directed day-to-day operations of several research and evaluation projects, including supervising instrument development, data collection activities, and data analyses. Projects have included evaluations of Junior Achievement Worldwide programs in the Middle East and Eastern Europe, in addition to the development of measurement systems for High Reliability Organizations and the Winning Spirit Assessment.

8/2003-8/2004 **Graduate Assistant,** WIRE/Worldwide Institute for Research and Evaluation and VDC/Van Dusen Consulting, Logan, Utah.
Acted as project manager for evaluation projects for national and international evaluations. Participated in instrument development, data analysis, and report writing. Presented content as part of international evaluation training workshops. Supervisor: Lani M. Van Dusen, Ph.D.

7/2001-6/2003 **Research Assistant**, Utah State University, Logan, Utah.
Served as research assistant for Community/University Research Initiative Grants: *Training for Utah's School Counselors: Applied Problem-Solving in Distance Education Learning Communities* (2001-2002) and *Using Technology to Enhance Training of Utah's School Counselors* (2002-2003). Participated in the creation, implementation, and evaluation of multimedia simulations for use in training counselor. Assisted in video-taping of scenarios, and design of assignments. Responsible for digitizing and captioning video; placing of the assignments on the Web interface, and collecting of outcome data.
Supervisor: Susan L. Crowley, Ph.D.

6/2002-8/2002 **Graduate Assistant**, WIRE/Western Institute for Research and Evaluation, Logan, Utah.
Served as data analysis coordinator. Activities included data entry and statistical analysis for a variety of evaluation projects for Junior Achievement, Inc., and the Milton Hershey School.
Supervisor: Lani M. Van Dusen, Ph.D.

4/2000-8/2001 **Behavioral Specialist**, Contract position, Northeastern Services, Logan,Utah.
Functioned as a consultant for line staff working with an adolescent with autism. Completed functional analysis of behavior. Responsible for behavioral recording and tracking systems. Assisted staff in developing and implementing new programs and activities. Provided staff training related to behaviors associated with autistic spectrum disorders and on seizure recognition.
Supervisor: Heather Harmon-Hoffman

8/1999-7/2001 **Clinical Assistant**, Utah State Division of Services for People With Disabilities, Logan, Utah.
Provided counseling services for individuals with disabilities and their families. Completed assessments of cognitive functioning and adaptive behavior as part of eligibility determination. Consulted with case managers, line staff, school and day training staff, and medical personnel regarding clients cognitive, behavioral and emotional functioning.
1152 clinical hours, 2000 total hours
Supervisor: David Stein, Ph.D.

6/1994-6/1996 **Child and Family Counselor**, Children In Need of Services (CHINS), Alamogordo, New Mexico.
Provided counseling services for children and their families through a community-based counseling program. Provided direct therapy and treatment planning. Areas of focus included preschool aged children, special education clients, and their families. Also engaged in case management, advocacy activities, consultation and counseling within client schools, consultation with social services, and community outreach and education.
664 clinical hours
Supervisor: Jake Meyer, M.A.

7/1990-3/1991 **Child Development Program Leader**, NAF, Spangdahlem Air Base, Germany.
Responsibilities as preschool teacher included weekly activity planning geared to meet the physical, social, emotional and intellectual needs of preschoolers, supervision of children, arrangement of classroom to accommodate daily activities and ensure safety, maintenance of appropriate records and reports, and participation in parent conferences. Evaluated and participated in the development of a before and after school program for kindergartners. Supervised Child Development Center weekend and evening openings. Supervisor: Virginia Green.

PRACTICA AND INTERNSHIP EXPERIENCE:

2004-2005 **Predoctoral Internship in Psychology,** Northwest Ohio Psychology Consortium, Medical University of Ohio, Toledo, Ohio.

Participated in a full-time internship that included major rotations at a community mental health facility and a child/adolescent psychiatric facility of a teaching hospital, as well as a minor rotation as part of a multidisciplinary team conducting pediatric developmental assessments. Completed comprehensive psychological assessments of children and adolescents, conducted intake interviews, and provided individual and group therapy.
1160 clinical hours, 2000 total hours
Supervisors: Michael P. Carey, Ph.D., Michele Knox, Ph.D., Tracey Carey, Ph.D., John Pansky, Ph.D, and Christine Prodente, Ph.D.

2001-2002 **Practicum in Counseling Psychology**, Student Counseling Center, Utah State University, Logan, Utah.
Conducted intake interviews and provided individual and family counseling to university students.
98 clinical hours, 227 total hours
Supervisors: Gwena Couillard, Ph.D., David Bush, Ph.D. and Jenna Le Jeune, M.A.

2000-2002 **Practicum in School Psychology**, Clinical Services, Center for Persons with Disabilities, Utah State University, Logan, Utah.
Functioned as a team member providing comprehensive psychological evaluations to children and adolescents. Responsible for intake interviews, social/emotional/cognitive/neuropsychological assessments, comprehensive report writing and feedback sessions with parents. Presented casess during weekly consultation meetings with a multidisciplinary team. Participated in IEP meetings with school personnel, at the request of parents. Provided parent training and therapy services to families of children receiving early intervention services.
266 clinical hours, 384 total hours
Supervisor: Pat Truhn, Ph.D.

1999-2000 **Practicum in Clinical Psychology**, Psychology Community Clinic, Utah State University, Logan, Utah.
Conducted intake interviews, psychological assessments, and individual, family, and couples therapy with clients from the community.
117 clinical hours, 306 total hours
Supervisors: Kevin Masters, Ph.D., Gretchen Gimpel, Ph.D.

1998-1999 **Internship as Counselor**, Huntingdon College Counseling and Career Center, Montgomery, Alabama.
Functioned as a full-time member of the Counseling and Career Center staff. Provided individual counseling to college students . Facilitated psychoeducational groups both on and off campus. Conducted and interpreted career and interest assessments. Completed networking and administrative duties related to the Job Location and Development Program. Participated as a team member for the selection and training of

FOSLs (Freshman Orientation Student Leaders). Attended in-service trainings and staff meetings.
223 clinical hours, 830 total hours
Supervisors: Catherine Collier, Ph.D., John Patrick, Ph.D., and Patty Simpkins, M.A.

1998-1999 **Advanced Counseling Practicum**, Therapeutic Programs, Inc., Montgomery, Alabama.
Provided individual and family therapy to children in therapeutic foster care placements. Consulted with case managers. Participated in agency staff meetings and client case staffings.
69 clinical hours, 95 total hours
Supervisors: William Mitchell, Ed.D. and Nancy Crumpton, Ed.D.

1996 **Internship as Home-Based Family Therapist**, The Counseling Center, Alamogordo, New Mexico.
Provided home-based family and individual therapy to clients through a mental health facility. Provided assessment, treatment planning and direct therapy for clients referred by social services or court-ordered into treatment. Also participated in agency staff meetings and client case staffings.
129 clinical hours, 166 total hours
Supervisor: Rod Merta, Ph.D.

1994 **Internship as Child and Family Counselor**, Children in Need of Services (CHINS), Alamogordo, New Mexico. Provided counseling services for children and families as staff member community based counseling agency. Provided direct therapy and treatment planning. Participated in staff meetings, in-service training, and interagency consultation.
87 clinical hours, 254 total hours
Supervisors: Michael Nystul, Ph.D. and Jake Meyer, M.A.

1993 **Practicum**, Personal Adjustment Program, New Mexico State University, Las Cruces, New Mexico. Provided counseling to college students in a college counseling center. Activities included direct counseling, assessment, treatment planning and referral services.
28 clinical hours, 146.5 total hours
Supervisors: Rod Merta, Ph.D. and Patrick Johnson, M.A.

ADDITIONAL CLINICAL EXPERIENCE:

5/2003-6/2003 **Student Evaluator, Autism Support Services: Evaluation, Research and Treatment (ASSERT) Program**, Center for Persons with Disabilities, Utah State University, Logan, Utah.
Participated in the design of an evaluation protocol for preschoolers involved in an applied behavior analysis treatment program for children with

pervasive developmental disorders. Participated in pre- and post-treatment evaluations for four children participating in the ASSERT program.
8 clinical hours, 20 total hours
Supervisors: Gretchen Gimpel, Ph.D. and Pat Truhn, Ph.D.

4/2002-3/2004 **Student Intern, Multidisciplinary Feeding Clinic**, Center for Persons with Disabilities, Utah State University, Logan, Utah.
Served as the psychology member of an interdisciplinary team providing evaluation and intervention services to children with feeding issues related to neuropsychological disabilities. Participated in interdisciplinary evaluations, development of treatment plans, and follow-up activities.
85 clinical hours, 120 total hours
Supervisors: Pat Truhn, Ph.D. and Vicki Simonsmier, M.S.

8/2001-7/2004 **Student Clinician, Clinical Services**, Center for Persons with Disabilities, Utah State University, Logan, Utah.
Served as a team member providing comprehensive multidisciplinary evaluations to children, adolescents, and adults. Responsible for initial evaluation interviews, social/emotional/behavioral, neuropsychological, nonverbal intelligence, and adaptive behavior assessment; comprehensive written reports, and feedback sessions with clients. Participated in IEP meetings with school personnel, at the request of parents.
220 clinical hours, 241 total hours
Supervisor: Pat Truhn.

6/2000-6/2004 **Student Therapist, Psychology Community Clinic**, Utah State University,
Logan, Utah.
Provided individual and marital therapy to adults, adolescents, and children with emotional and behavioral disorders. Administered and interpreted relevant psychological and psychoeducational testing and provided feedback to clients.
531 clinical hours, 693 total hours
Supervisors: Susan L. Crowley, Ph.D., Carolyn Barcus, Ed.D., Gretchen Gimpel, Ph.D., and Kevin Masters, Ph.D.

9/1999-6/2004 **Student Therapist, Attention-Deficit/Hyperactivity Disorder Treatment Study**, Utah State University.
Provided parent training and stress management treatment to parents of children diagnosed with ADHD. Responsible for conducting intake interviews and weekly treatment sessions, writing treatment summaries, and communicating regularly with physician referral sources. Conducted initial and post-treatment assessments.
79 clinical hours, 118 total hours
Supervisor: Gretchen Gimpel, Ph.D.

8/2001-7/2002 **Trainee, Utah Leadership Education in Neurodevelopmental Disabilities**,
University of Utah Medical Center, Salt Lake City, Utah; and Center for Persons with Disabilities, Utah State University, Logan, Utah.
Participated as the psychology trainee in an interdisciplinary training program designed to enhance clinical, research, and leadership skills in current and future healthcare providers for children with neurodevelopmental disabilities. Attended weekly didactic meetings focusing on leadership skills, neurodevelopmental disabilities, interdisciplinary practice, and healthcare funding issues. Completed 100 clinical hours at pediatric sites at Primary Children's Hospital and the Center for Persons with Disabilities, including the Dental Clinic, Craniofacial Clinic, early intervention services, Feeding Clinic, Clinical Services, and Neonatal Follow-up Clinic. Participated in a research project examining genetic factors and attention deficit hyperactivity disorder.
100 clinical hours, 300 total hours
Supervisors: Gretchen Gimpel, Ph.D., Judith Holt, Ph.D., and Fan Tait, M.D.

RESEARCH EXPERIENCE:

11/2002-12/2003 **Parents' perceptions of children's psychoeducational evaluations**.
Co-investigators: Angela Ehrlick, M.S., Gretchen Gimpel, Utah State University, and Brent Collett, Ph.D., University of Washington.
Investigating parents' satisfaction with their children's psychoeducational evaluations and their understanding of evaluation results as verbally communicated to them by clinicians. Parents are contacted by telephone one to two weeks following a session in which results are communicated, and their satisfaction is assessed through an interview. Responsible for conducting phone interviews and coding data.

12/2002-1/2003 **Maternal and paternal attributions and perceptions related to parent-child interactions: The influence of parent well-being and child behavior.**
Principle Investigator: Angela Ehrlick, M.S., Utah State University.
Investigated the relationship between parent-reported satisfaction and efficacy in the parenting role, parent stress level, and child behavior on parents' attributions for and perceptions of their children's behavior during parent-child interactions. Completed reliability checks by viewing and coding child and parent behaviors during two five-minute interactions.

12/2001-5/2002 **Supervisor-supervisee match: An investigation of personality factors.**
Principle Investigator: Susan L. Crowely, Ph.D., Utah State University.
Investigated the fit of supervisor and trainee in relation to gender and personality factors, and the relationship between these factors and trainee satisfaction with supervision. Conducted an exhaustive literature review of current supervision literature related to individual differences and satisfaction with supervision. Conducted preliminary data on personality, gender, and supervision satisfaction.

1/2000-5/2001 **Adaptation of parent-child interaction therapy (PCIT) for use in preschool classrooms.**
Principle Investigator: Brent Collett, M.S., Utah State University.
Investigated the effectiveness of an adaptation of parent-child interaction therapy for use in preschool classrooms. Responsible for completing classroom observations of teacher and student behavior in classes where teachers had received training in adapted parent-child interaction techniques.

9/1999-6/2004 **Treatment of attention deficit-hyperactivity disorder**.
Principle Investigator: Gretchen Gimpel, Ph.D., Utah State University.
Investigated the clinical effectiveness of parent training/behavior therapy for ADHD in children. Responsible for conducting parent-child interaction therapy with children diagnosed with ADHD and their parents. Participated in ancillary study examining the impact of stimulant medication on IQ scores. Attended weekly research team meetings.

TEACHING EXPERIENCE:

8/2003-12/2003 and 8/2007-12/2007 **Instructor, Introduction to Interviewing and Counseling**, Utah State University, Logan, Utah.
Served as course instructor for an undergraduate introduction to interviewing and counseling course. Activities included providing didactic instruction; test development, administration, and grading; facilitation of classroom applied learning experiences; and grading of homework assignments.

2002-5/2004 **Co-Instructor, Theories of Personality, EdNet,** Utah State University, Logan, Utah.
Served as co-instructor for five semesters of an undergraduate theories of personality class. Activities included lecturing, grading papers, test development and grading, and responding to student questions.
Co-Instructor: Susan L. Crowley, Ph.D.

2001-5/2004 **Teaching Assistant, Theories of Personality**, Utah State University, Logan, Utah.
Acted as a teaching assistant for five semesters of an undergraduate theories of personality class. Activities included grading papers, assisting in test development and grading, guest lecturing, and holding office hours to address student questions.
Supervisor: Susan L. Crowley, Ph.D.

8/2002-12/2002 **Teaching Apprenticeship, Introduction to Theory and Practicum in Counseling**, Utah State University, Logan Utah.
Facilitated completion of technology-based assignments and subsequent discussion, in an introductory graduate-level course in counseling. Provided didactic instruction related to intake interviewing and specific counseling

responses. Viewed student tapes of mock therapy sessions and provided feedback.
Supervisor: Susan L. Crowley, Ph.D.

8/2001-12/2001 and 8/2003-12/2003 **Guest Facilitator, Introduction to Theory and Practicum in Counseling**, Utah State University, Logan Utah.
Facilitated completion of technology-based assignments and subsequent discussion, in an introductory graduate-level course in counseling. Provided didactic instruction related to intake interviewing and specific counseling responses. Assisted in grading of student exams and assignments.
Supervisor: Susan L. Crowley, Ph.D.

MANUSCRIPTS:

Gimpel, G. A., Collett, B, R., Veeder, M. A., Gifford, J. A., Sneddon, P., Bushman, B., Hughes, K., & Odell, J. D. (2005). The effects of stimulant medication on the cognitive performance of children with ADHD. Clinical Pediatrics, 44, 405-411.

CONFERENCE PRESENTATIONS:

Sanborn, W., & Veeder, M.A., (June, 2006). Substantial K-3 reading progress in BIA Reading First schools. Presentation at the annual conference of the American Indian Psychologists and Psychology Graduate Students. Logan, UT.

Ehrlick, A., Gimpel, G.A., & Veeder, M.A. (November, 2003). Parental Perceptions of Children's Behaviors. Poster presented at the annual conference of the Association for Advancement of Behavior Therapy. Boston, MA.

Ehrlick, A., Gimpel, G.A., Collett, B.R., & Veeder, M.A. (August, 2003). Maternal and paternal attributions for children's compliant and non-compliant behavior. Poster presented at the annual conference of the American Psychological Association. Toronto, Canada.

Veeder, M.A., Crowley, S.L., & Rowland. (2002, October). Using technology to enhance trainee counseling skills in working with children and adolescents. Poster presented at the bi-annual conference, the Kansas Conference in Child Clinical Psychology. Lawrence, KS.

Crowley, S.L., Rowland, C., & Veeder, M.A. (2002, June). Using technology in training for multicultural competence. Presentation at the annual conference of the American Indian Psychologists and Psychology Graduate Students. Logan, UT.

Gimpel, G. A., Berglof, H., Ehrlick, A., Veeder, M., Jones, T., & Johnson, C. (2001, November). Trials and tribulations in parent training: Uncovering hidden obstacles to effective intervention. In W. Warzak (Chair), Troubleshooting behavioral protocols: What to do when the tried and true fail. Symposium conducted at the international conference, Association for Behavior Analysis. Venice, Italy.

Collett, B.R., Ehrlick, A., Johnson, C., Veeder, M., Berglof, H., Gunderson, T., Jones, T., Gage, J., Gimpel, G.A., & Odell J.D. (August, 2001). Differentiating ADHD subtypes in clinical practice. Poster presented at the annual conference of the American Psychological Association. San Francisco, CA.

Gimpel, G.A., Collett, B.R., Gage, J., Gunderson, T., Veeder, M., Berglof, H., Jones, T., Ehrlick, A., Johnson, C., Greenson, J., Rollins, L., & Hlavaty, S. (August, 2001). Treatment of ADHD: Preliminary findings from a parent training program. Poster presented at the annual conference of the American Psychological Association. San Francisco, CA.

Collett, B.R., Gimpel, G.A., Veeder, M., & Jones, T. (2000, October). Teacher-child interaction therapy (TCIT): An adaptation of parent-child interaction therapy (PCIT) for use in preschool classrooms. Paper presented at the bi-annual conference, the Kansas Conference in Child Clinical Psychology. Lawrence, KS.

Collett, B.R., Gimpel, G.A., Crowley, S.L., Veeder, M., & Jones, T. (2000, October). Disruptive behaviors in preschool children: The psychometric properties and factor structure of the Disruptive Behaviors Disorders Rating Scale. Poster presented at the bi-annual conference, the Kansas Conference in Child Clinical Psychology. Lawrence, KS.

Hurd, P., Simpkins, P.A., & Veeder, M.A. (1999, November). Dual relationships: Unavoidable and problematic? Symposium presented at the Alabama Counseling Association (ALCA) annual conference. Mobile, Alabama.

TECHNICAL REPORTS:

Van Dusen, L.M., & Veeder, M.A. (2006). Comprehensive summative evaluation of the Expanded Global Business Ethics Program. (Tech. Rep. No. 286). Logan, UT: Worldwide Institute for Research and Evaluation.

Van Dusen, L.M., & Veeder, M.A. (2006). Comprehensive formative evaluation of Junior Achievement programs in the Middle East. (Tech. Rep. No. 285). Logan, UT: Worldwide Institute for Research and Evaluation.

Van Dusen, L.M., & Veeder, M.A. (2005). Summative evaluation of the Global Business Ethics Program. (Tech. Rep. No. 283). Logan, UT: Worldwide Institute for Research and Evaluation.

Van Dusen, L.M., & Veeder, M.A. (2005). Comprehensive formative evaluation of the Global Business Ethics expanded program. (Tech. Rep. No. 281). Logan, UT: Worldwide Institute for Research and Evaluation.

Van Dusen, L.M., & Veeder, M.A. (2004). Assessment of classroom learning environments. (Tech. Rep. No. 280). Logan, UT: Worldwide Institute for Research and Evaluation.

Edmondson, R.S., Veeder, M.A., & Van Dusen L.M. (2003). Evaluation of the impact of the Elementary School Program at the kindergarten, first, and second grade levels. (Tech. Rep. No. 279). Logan, UT: Worldwide Institute for Research and Evaluation.

Van Dusen L., & Veeder, M. (2003). Impact of the Economics Teacher Training. (Tech. Rep. No. 278). Logan, UT: Worldwide Institute for Research and Evaluation in conjunction with Van Dusen Consulting.

Van Dusen, L.M., & Veeder, M.A (2003). Comprehensive summative evaluation of the JA Personal Finance program. (Tech. Rep. No. 277). Logan, UT: Worldwide Institute for Research and Evaluation.

Van Dusen, L.M., & Veeder, M. (2003). Second year of the longitudinal impact evaluation. (Tech. Rep. No. 275). Logan, UT: Worldwide Institute for Research and Evaluation.

Van Dusen L., & Veeder, M. (2002). Summative Impact of ESIS and JA TITAN. (Tech. Rep. No. 10-21). (All twelve final reports were similar with the exception of the findings section). Logan, UT: Western Institute for Research and Evaluation.

PRESENTATIONS:

Veeder, M. Autism Spectrum Disorders: Assessment and Treatment. Inservice training provided to staff at Children's Safe Harbor/Harbor Behavioral Healthcare. Toledo, OH. May 18, 2005.

Cook, R.S., & Veeder, M. Confidentiality in psychotherapy: The emperor has no clothes. Presentation given at WIP, Utah State University. Logan, Utah. December 12, 2001.

Ehrlick, A., Lensegrav-Benson, T., & Veeder, M. Tips for Conducting Psychoeducational Assessments with Children, Presentation given at Clinical Services, Center for Persons with Disabilities, Utah State University, Logan, Utah. November 1, 2002.

Veeder, M. Attention-Deficit Hyperactivity Disorder and Genetics. Presentation given at Utah Leadership Education in Neurodevelopmental Disabilities seminar, Utah State University, Logan, Utah. April 26, 2002.

Veeder, M. Using the Leiter-R and Tips for Testing Non-verbal or Less-Verbal Students. Presentation given to graduate psychoeducational assessment class, Utah State University, Logan, Utah. March 10, 2001, April 8, 2002, February 10, 2003, and March 22, 2004.

Veeder, M. Neuropsychological Testing. In-service Training given at Clinical Services, Center for Persons with Disabilities, Utah State University, Logan, Utah. March 9, 2001, November 30, 2001, November 8, 2002.

Veeder, M. Memory Testing with Children and Adults: The Wechsler Memory Scale and the Children's Memory Scale. In-service Training given at Clinical Services, Center for Persons with Disabilities, Utah State University, Logan, Utah. November 16, 2001.

PROFESSIONAL SERVICE:

2003-2004 **Utah State University Campus Representative,** Consortium of Combined and Integrated Programs in Psychology

COMMUNITY ACTIVITIES:

1998-1999 **Member, Maxwell Air Force Base School Board,** Maxwell Air Force Base, Alabama.

1997-1999 **Member, Management Leadership Committee**, Maxwell Air Force Base Elementary School, Maxwell Air Force Base, Alabama.

1996-1998 **Facilitator, Exceptional Family Member Support Group**, Maxwell Air Force Base, Alabama.

1993-1996 **Member, Board of Directors, Zia Therapy Center**, Alamogordo, New Mexico.

1991-1992 **Coordinator/Facilitator, Education and Support Group for Single Parents of Young Children**, Family Support Center, Nellis Air Force Base, Nevada.

1990-1991 **Coordinator/Facilitator, Desert Shield/Desert Storm Play Group**, Spangdahlem Air Base, Germany.

1989-1990 **Facilitator, Peer Counseling Program for 5th through 8th graders**, Spangdahlem Air Base, Germany.

HONORS AND AWARDS

2002-2003 Recipient of the Elwin C. Nielsen Scholarship, Utah State University
1999-2000 Recipient of the Presidential Fellowship, College of Education, Utah State University

PROFESSIONAL AFFILIATIONS:

1987-present American Psychological Association, Student Affiliate
2002-present Society of Indian Psychologists, Student Member

REFERENCES:

Susan L. Crowley, Ph.D.
Professor/Director of Training
Department of Psychology
Utah State University
2810 Old Main Hill
Logan, Utah 84322-2810
(435)797-1251
susanc@cc.usu.edu

Robert S. Cook, Ph.D.
Program Director
Clinical Services Program
Utah State University
Logan, Utah 84322-6813
(435)797-3822
robertc@cpd2.usu.edu

Carolyn Barcus, Ed.D.
Clinical Assistant Professor
Department of Psychology
Utah State University
2810 Old Main Hill
Logan, Utah 84322-2810
(435)797-1465
cbarcus@cc.usu.edu

Michael P. Carey, Ph.D.
Clinical Child Psychologist
Scott & White Clinic/TAMUHSC HSC
Division of Child & Adolescent Psychiatry
2401 South 31st Street
Temple, TX 76508
(254)724-2806
mcarey@swmail.sw.org

Lani M. Van Dusen, Ph.D.
President
Van Dusen Consulting & Worldwide
Institute for Research & Evaluation
550 North Main, Suite 210
Logan, Utah 84321
lani@vandusenconsulting.com