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Tripartite Structure of Positive and Negative Affect, Depression, and Anxiety in Child and Adolescent Psychiatric Inpatients

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The tripartite model of depression and anxiety suggests that depression and anxiety have shared (generalized negative affect) and specific (anhedonia and physiological hyperarousal) components. In one of the 1st studies to examine the structure of mood-related symptoms in youngsters, this model was tested among 116 child and adolescent psychiatric inpatients, ages 8–16 (M = 12.46; SD = 2.33). Consistent with the tripartite model, a 3-factor (Depression, Anxiety, and Negative Affect) model represented the observed data well. Follow-up analyses suggested that a nonhierarchical arrangement of the 3 factors may be preferable to a hierarchical one.

Interest in childhood internalizing disorders has been growing steadily over the past 15 years. In addition to examining prevalence and correlates of childhood anxiety and depressive disorders, early studies addressed diagnostic issues. Over time, many of the adult diagnostic criteria were deemed useful in identifying anxiety and depression in children and adolescents. Regarding depression, unmodified adult diagnostic criteria have been used commonly to identify the disorder in children and adolescents. Regarding anxiety, youngsters who previously would have met criteria for the childhood diagnosis of Overanxious Disorder are now classified in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) under Generalized Anxiety Disorder, a long-standing adult diagnosis.

Given the growing convergence of diagnostic criteria for internalizing disorders among adults and children, it is not surprising that some of the same controversies exist in the adult and child literatures concerning internalizing disorders. Currently, a salient diagnostic issue in understanding anxious and depressive disorders concerns the topics of co-morbidity and specificity. Many popular self-report symptom measures for both children and adults display very good convergent validity but poor discriminant validity. The problems with discriminant validity have led several researchers to question whether anxiety and depression represent unique disorders, or instead, are demonstrative of a more general level of emotional distress commonly labeled *Negative Affect* (*NA*).

NA refers to a broad general factor of emotional distress that includes moods such as fear, sadness, anger, and guilt (Watson & Clark, 1984; Watson & Tellegen, 1985). The high correlations found among adult and child self-report measures of anxiety and depression have been explained in light of the NA construct (e.g., Brady & Kendall, 1992; Feldman, 1993; Finch, Lipovsky, & Casat, 1989; King, Ollendick, & Gullone, 1991; Lonigan, Carey, & Finch, 1994; Stark, Kaslow, & Laurent, 1993; Watson & Clark, 1984; Watson, Clark, & Tellegen, 1988; Wolfe et al., 1987).

The potential to differentiate anxiety and depressive disorders has rested, in part, on the Positive Affect (PA) construct (Watson & Clark, 1984; Watson & Tellegen, 1985). PA reflects "pleasurable engagement with the environment" (Watson, Clark, & Carey, 1988, p. 347). Individuals experiencing anxiety and depression may exhibit similar, elevated scores on measures of NA. However, the distinguishing characteristic is that depressed individuals also score low on measures of PA (Watson, Clark, & Carey, 1988; Watson, Clark, Tellegen, 1988). Lonigan et al. (1994) reported results consistent with this view among child and adolescent psychiatric patients.

In their tripartite model of depression and anxiety, L. A. Clark and Watson (1991) formalized the findings on PA and NA into a theoretical model, wherein depression is specifically characterized by anhedonia (low PA), anxiety is specifically characterized by physiological hyperarousal, and general NA is a nonspecific factor that relates to both depression and anxiety. The model has considerable potential importance from both theoretical and applied standpoints.

Theoretically, identification of the specific phenomenological characteristics of depressed and anxious syndromes may refine theories regarding the cause, course, and epidemiology of each. For example, Joiner and Blalock (1995) reported that gender differences in depression were largely due to differences in nonspecific factors, such as NA, as opposed to factors specific to depression, such as anhedonia. This finding, in turn, may in-

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fluence theories on the nature and causes of the gender difference in depression.

Clinically, the tripartite model has implications for diagnosis (e.g., distinguishing depression and anxiety) and may also be useful in psychotherapy of depression and anxiety. For example, cognitive approaches to these disorders emphasize awareness of emotional states and their cognitive correlates. Patients who understand the difference between depression, anxiety, and generalized NA may be able to identify better and to alter the cognitions that precede these states (see, e.g., Kendall, Kortlander, Chansky, & Brady, 1992).

Of course, the validity of the tripartite model requires empirical scrutiny before it can fully deliver on its theoretical and clinical promise. The purpose of the current study was to assess the construct validity of the tripartite model among child and adolescent psychiatric patients, with specific reference to the theoretical three-factor structure of the model.

Past factor analytic work on the tripartite model offers some reason to suspect that the three-factor structure is valid, at least among adults. For example, in an analysis of a 90-item mood and anxiety symptom questionnaire, Watson, Clark, et al. (1995) obtained three factors that corresponded to the tripartite distinctions of Generalized Distress, Specific Depression (Anhedonia), and Specific Anxiety (Physiological Hyperarousal). This factor solution, obtained using principal factor analysis, was similar across undergraduate, community, and patient samples. Similarly, although directed at cognitions and not symptoms, Jolly and Dykman (1994) derived a three-factor structure of mood-related cognition, consisting of general cognitions, depression-specific cognitions, and anxiety-specific cognitions. Like Watson, Clark, et al., Jolly and Dykman used a principal factor-analytic approach.

The findings of D. A. Clark, Steer, and Beck (1994) revealed some convergence, as well as an interesting difference, as compared to the results of Watson, Clark, et al. (1995) and Jolly and Dykman (1994). In their study of the items of the Beck Depression Inventory (Beck & Steer, 1987) and the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988), D. A. Clark et al. obtained a two-factor, first-order solution, with Depression and Anxiety as factors. The first-order Depression and Anxiety factors loaded, in turn, onto a third, higher order General Distress factor. D. A. Clark et al. found that the first-order Depression and Anxiety factors remained even after the higher order Distress factor was statistically controlled. Accordingly, these authors interpreted their findings as supportive of the tripartite model, in that factors corresponding to specific depression, specific anxiety, and NA emerged. Like Watson, Clark, et al. and Jolly and Dykman, D. A. Clark et al. used a principal factor-analytic approach, but they also used a Schmid–Leiman transformation to examine the higher order factor structure (see also Steer, Clark, Beck, & Ranieri, 1995).

Is there a difference between the structures of mood-related symptoms in the solutions of D. A. Clark et al. (1994) and those of Watson, Clark, et al. (1995) and Jolly and Dykman (1994)? In each of these studies, three factors emerged. However, the results of D. A. Clark et al. can be interpreted as assigning primacy to the NA factor, in that it subsumed the first-order Depression and Anxiety factors, whereas the findings of Watson, Clark, et al. and Jolly and Dykman portrayed depression, anxiety, and NA at the same level of abstraction (i.e., at the first-order level). Thus, at this early stage of research into the factorial construct validity of the tripartite model, a consensus is emerging, but with a subplot: three factors, but how arranged?

It is notable that although aspects of the tripartite model have been addressed among youth samples—especially NA (e.g., Finch et al., 1989; Wolfe et al., 1987)—the construct validity of the model has received little attention in child and adolescent samples (Lonigan et al., 1994, is a notable exception). The goals of the present study were to investigate the structure of mood-related symptoms among child and adolescent psychiatric patients and to determine whether a three-factor version of the tripartite model of depression and anxiety received empirical support. An additional purpose was to assess whether a hierarchical arrangement of factors emerged in our sample of youth psychiatric inpatients. We followed the approach of D. A. Clark et al. (1994) and performed factor analyses with a Schmid–Leiman transformation.

Method

Participants

Participants included 116 youngsters (66 boys; 50 girls), ages 8–16 (M = 12.46; SD = 2.33). The majority of participants were Caucasian (67 of 116; 58%); 29 were Hispanic (25%); and 20 were African American (17%). All children–adolescents were psychiatric inpatients at a large academic medical center. The participants represent an essentially consecutive series of admissions over approximately 13 months.

Inclusion criteria for the study were that children–adolescents were psychiatric inpatients and that they forthrightly completed all relevant measures. Youngsters who were unable (e.g., stated inability or difficulty reading; severe psychosis) or unwilling to participate were excluded. Therefore, it is likely that a relatively broad cross-section of child and adolescent psychiatric inpatients were included and that the sample is reasonably representative of general child/adolescent psychiatric patients.

Structured clinical interviews were not conducted on these patients. Chart diagnoses, established by a treatment team with representatives from various disciplines, are summarized in Table 1.

Not surprisingly, Mood and Externalizing Disorders were the most common diagnoses. Although Anxiety Disorders were less common, the descriptive data indicate that these patients experienced high levels of syndrome anxiety. (Jolly, Dyck, Kramer, and Wherry, 1994, obtained similar percentages of depressed vs. anxious patients among outpatient adults.) Overall, 90 of the 116 participants (78%) in the present study experienced a Mood or Anxiety disorder.

Diagnostic status are not included in the analyses, because the reliability and validity of the chart diagnoses are unknown. Therefore, the emphasis of this study was not on any particular disorders (e.g., Major Depression, Generalized Anxiety Disorder) but rather on the syndromal constructs of depression, anxiety, PA, and NA as they occur in a general population of psychiatric inpatients. This approach is similar to that taken in past work on children and adolescents (Curry & Craighead, 1990a; Joiner & Barnett, 1994) and adults (Jolly et al., 1994; Rose, Abramson, Hodulik, Halberstadt, & Leff, 1994), including those examining the tripartite model in adults (Watson, Clark, et al., 1995; Watson, Weber, et al., 1995). In addition, it should be noted that youngsters who meet formal diagnostic criteria for any psychiatric disorder are quite likely to experience mood-related symptoms, even if their diagnosis is not Mood or Anxiety disorder (e.g., Curry & Craighead 1990b).

Table 1
Chart Diagnoses of Sample

Diagnosis	*N*	% of total
Mood Disorders	86	46.7
Major Depression	38	20.7
Depressive Disorder NOS	22	12.0
Bipolar Disorder	24	13.0
Dysthymia	2	1.1
Anxiety Disorders	20	10.9
Separation Anxiety	4	2.2
Overanxious	5	2.7
PTSD	7	3.8
Avoidant	2	1.1
Agoraphobia	1	0.6
Simple Phobia	1	0.6
ADHD	22	12.0
Conduct Disorder	16	8.7
Adjustment Disorder	6	3.3
ODD	7	3.8
Thought Disordered	6	3.3
Schizophrenia	1	0.6
Psychosis NOS	5	2.7
Organic Mood Disorder	5	2.7
Organic Mental Disorder NOS	3	1.6
Substance Abuse	5	2.7
Enuresis	3	1.6
Personality Disorders	1	0.6
Conversion Disorder	1	0.6
Hypochondriasis	1	0.6
Intermittent-Explosive Disorder	1	0.6
Tourette's	1	0.6
Total	184	100

Note. Total number of diagnoses exceeds total number of patients because many had more than one diagnosis. NOS = not otherwise specified; PTSD = posttraumatic stress disorder; ADHD = attention deficit hyperactivity disorder; ODD = oppositional-defiant disorder.

Measures

Children's Depression Inventory (CDI; Kovacs, 1981, 1992). The CDI is a reliable and well-validated 27-item self-report measure of depressed symptoms. Kovacs (1981) reported adequate internal consistency and 1-month test–retest reliabilities (.86 and .72, respectively) for the scale as a whole. The scale has been adequately validated (e.g., correlates significantly [$r = .55$] with clinician-rated depression). In the present sample, coefficient alpha for the total scale was .89.

Kovacs (1992) reviewed factorial studies of the CDI and concluded that a five-factor structure garnered the most support. The five CDI subscales are: Negative Mood (6 items; e.g., sadness, feel like crying); Anhedonia (8 items; e.g., trouble sleeping, fatigue, appetite disturbance); Negative Self-Esteem (5 items; e.g., self-hate, feeling unattractive); Ineffectiveness (4 items; e.g., doing things wrong, poor schoolwork); and Interpersonal Problems (4 items; e.g., not getting along with others, poor behavior). Kovacs reported alpha coefficients for the five CDI subscales ranging from .59 (Interpersonal Problems) to .68 (Negative Self-Esteem). In the present sample, alphas were as follows: Negative Mood (.69), Interpersonal Problems (.72), Ineffectiveness (.62), Anhedonia (.60), and Self-Esteem (.77). The subscales' validities have some factorial support, but supportive convergent–discriminant validity studies are lacking.

Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985). The RCMAS is a 37-item scale that assesses general anxiety. Internal consistency coefficients average in the .80s (Paget & Reynolds, 1984), and Pela and Reynolds (1982) found 3-week test–retest coefficients in the .90s. Regarding validity, Reynolds and Richmond (1985) reported a series of supportive factor analytic and convergent–discriminant validity studies (e.g., Reynolds, 1982). In the present sample, coefficient alpha for the total scale was .87.

The RCMAS contains four subscales: Physiological Anxiety (10 items; e.g., "trouble catching breath," "hands feel sweaty"), Worry/Oversensitivity (11 items; e.g., "worry a lot," "feelings easily hurt"), Social Concerns (7 items; e.g., "others are against me," "others are happier than I"), and a Lie scale (9 items; e.g., "I am always kind," "I never get angry"). Coefficient alphas for the four subscales range from the high .50s to the high .70s. In the present sample, they were as follows: Physiological Anxiety (.75), Worry/Oversensitivity (.80), Social Concerns (.63), and Lie scale (.75). Similar to the CDI, the subscales' validities have some factorial support, but in general, supportive convergent–discriminant validity data are thin.

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The original PANAS includes two 10-item scales, one for PA (the extent to which a person feels enthusiastic, active, and alert) and one for NA (the extent to which a person experiences subjective distress such as anger, disgust, guilt, and fear; for reliability and validity data, see Watson, 1988; Watson, Clark, & Tellegen, 1988). It should be noted that the absence of PA denotes anhedonia, which L. A. Clark and Watson (1991) argued distinguishes depression from anxiety. In contrast, NA is viewed as nonspecific.

To make the scale more accessible for youngsters, the instructions were simplified, and children were instructed to ask the examiner if they did not know the meanings of any words. Furthermore, six of the original items were amended, and one was replaced. The six amended items, with the original versions in parentheses, are: angry (hostile); lively (inspired); paying good attention (attentive); jumpy (jittery); stressed out (distressed); and eager (enthusiastic). The one new descriptor is: satisfied (determined). Also, youngsters were provided with a glossary of the 20 items. For example, the word *irritable* was defined by the glossary as "grumpy"; the word *lively* was defined as "having a lot of energy." Youngsters completed the revised PANAS with respect to their feelings during the past 2 weeks.

There is reason to suspect that the revised PANAS is both reliable and valid. First, coefficient alpha in the present sample was .84 for PA and .80 for NA. Second, the correlation between PA and NA in the present sample (−.20) mirrors that reported among adults (e.g., Watson, Clark, & Tellegen, 1988). Third, Laurent, Potter, and Catanzaro (1994) have reported reliability and validity data on their PANAS-Child Version, a 30-item measure that includes 18 of the 20 items from the present study's revised PANAS. Laurent et al. reported coefficient alphas of .91 for PA and .88 for NA, similar to those reported herein. Furthermore, Laurent et al. obtained intercorrelations between PA, NA, CDI, and State–Trait Anxiety Inventory for Children (Spielberger, Edwards, Montuon, & Lushene, 1970), which are similar to those reported herein (see Table 2), as well as to those reported in adults (Watson, Clark, & Tellegen, 1988). Taken together, these findings lend preliminary support to the reliability and validity of the revised PANAS.

Procedure

Within 4 days of admission to the youth psychiatric units of a large southwestern academic medical center, patients were administered the measures by a trained master's-level psychometrist, as a standard part of patient care. Measures were administered individually and were completed in the presence of the psychometrist.

Results

Means, standard deviations, and intercorrelations are presented in Table 2. As can be seen there, the means for the CDI

Table 2
Means and Standard Deviations of and Intercorrelations Between All Measures

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13
1. PA													
M	27.43												
SD	6.76												
2. NA													
M	−20	21.51											
SD		6.36											
3. CDI Total													
M	−45**	53**	14.86										
SD			10.51										
4. CDI Mood													
M	−27**	54**	84**	3.15									
SD				2.84									
5. CDI IP													
M	−36**	30**	70**	44**	2.06								
SD					2.08								
6. CDI Ineff													
M	−49**	34**	80**	56**	50**	2.66							
SD						2.24							
7. CDI Anhe													
M	−35**	50**	85**	65**	52**	57**	4.92						
SD							3.33						
8. CDI SE													
M	−39**	38**	84**	67**	49**	67**	57**	2.04					
SD								2.43					
9. RCMAS Total													
M	−28**	65**	60**	59**	20	51**	56**	49**	12.61				
SD									6.72				
10. RCMAS Phys													
M	−28**	55**	55**	57**	19	45*	51**	45**	84**	4.71			
SD										2.64			
11. RCMAS Worry													
M	−06	59**	42**	47**	04	34**	45**	32**	89**	60**	4.97		
SD											3.22		
12. RCMAS Social													
M	−45**	50**	58**	46**	34**	56**	46**	52**	78**	52*	57**	2.95	
SD												2.09	
13. RCMAS Lie													
M	19	−28**	−43**	−32**	−48**	−37**	−21*	−40**	−21*	−19	−06	−35**	3.10
SD													2.49

Note. PA = Positive Affect; NA = Negative Affect; CDI = Children's Depression Inventory; IP = interpersonal problems; Ineff = ineffectiveness; Anhe = anhedonia; SE = self-esteem; RCMAS = Revised Children's Manifest Anxiety Scale; Phys = physiological anxiety; Social = social concerns.
* $p < .05$. ** $p < .01$.

and RCMAS are elevated and in line with the means reported in the respective manuals for clinical samples. The pattern of correlations is also consistent with expectation. For example, the CDI and RCMAS total scores and subscale scores are, in general, significantly intercorrelated. As expected, NA was strongly correlated with both the CDI and RCMAS (the NA–CDI correlation was not significantly different than the NA–RCMAS correlation); for significance of difference between dependent correlations, $t(113) = 1.92$, *ns* (see Cohen & Cohen, 1983, pp. 53–54), whereas PA was more strongly related to the CDI than to the RCMAS (the PA–CDI correlation was significantly different than the PA–RCMAS correlation); for significance of difference between dependent correlations, $t(113) = 2.26$, $p < .05$. PA and NA were minimally and negatively correlated, consistent with past work with adults (Watson, Clark, & Tellegen, 1988).

Factor Analyses and Schmid–Leiman Transformation

Our analytic strategy, modeled after that of D. A. Clark et al. (1994), involved factor analyses of items selected from the CDI and RCMAS to purely capture the constructs of the tripartite model. Furthermore, a Schmid–Leiman transformation (see Gorsuch, 1983, pp. 249–254; Loehlin, 1987, pp. 205–208) was conducted to address whether the factors may be hierarchically arranged. Finally, the patterns of correlations between the item-based factors and the revised PANAS were examined to provide a further test of the model.

On rational grounds, we selected CDI and RCMAS 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 Physiological Hyperarousal (RCMAS Items 5, 17, 19). Table 3 contains brief descriptions of the content of each of these items.

Table 3
Loadings of Selected CDI and RCMAS Items on Three Components From a Principal Components Analysis With Oblique Rotation

Scale and item	PA	NA	Physiological Hyperarousal
1. CDI Item 4 ("have fun")	.73	.22	.16
2. CDI Item 12 ("like being with people")	.56	.03	.50
3. CDI Item 21 ("have fun at school")	.39	−.05	−.09
4. RCMAS Item 23 ("others happier than I" 1 = *True;* 2 = *False*)	.72	.38	.12
5. CDI Item 1 ("sad")	.19	.69	.34
6. CDI Item 10 ("feel like crying")	.48	.36	.64
7. CDI Item 11 ("things bother me")	.42	.50	.29
8. RCMAS Item 6 ("worry a lot")	.29	.57	.46
9. RCMAS Item 7 ("afraid")	−.10	.72	.08
10. RCMAS Item 9 ("get mad")	.55	.04	.37
11. RCMAS Item 10 ("worry what parents say")	.18	.77	.08
12. RCMAS Item 14 ("worry what others say")	−.09	.26	−.34
13. RCMAS Item 30 ("worry when go to bed")	.31	.60	.41
14. RCMAS Item 34 ("nervous")	−.01	.64	.12
15. RCMAS Item 37 ("worry about something bad")	.16	.35	.37
16. RCMAS Item 5 ("trouble getting breath")	−.37	.28	.56
17. RCMAS Item 17 ("feel sick in stomach")	.08	.18	.72
18. RCMAS Item 19 ("hands feel sweaty")	.03	.39	.58

Note. PA = Positive Affect; NA = Negative Affect; CDI = Children's Depression Inventory; RCMAS = Revised Children's Manifest Anxiety Scale. Underlined factor loadings correspond to items rationally selected to assess the construct in question.

We subjected these items to a factor analysis with oblique rotation (using Oblimin) and used the following estimation criteria to make judgments regarding retention of factors: (a) Kaiser's (1961) criterion to retain factors with unrotated eigenvalues greater than one; (b) a scree test (Cattell, 1966); and (c) the interpretability of resulting factor structures (Gorsuch, 1983), which involves examining solutions with different extraction criteria to determine the point at which trivial, redundant, or uninterpretable factors emerge (see, e.g., Tobin, Johnson, Steinberg, Staats, & Dennis, 1991).

Taken together, these retention criteria indicated that a three-factor solution was the most defensible. More specifically, although six factors possessed eigenvalues greater than one (first 10 eigenvalues = 4.79, 1.95, 1.53, 1.42, 1.16, 1.05, .91, .87, .70, and .68), one could argue that the scree occurred after the first, second, or fourth factors, which excludes the fifth and sixth factors. As for the remaining four factors, each contributed a nontrivial amount of variance (27%, 11%, 9%, and 8%). However, the fourth factor was redundant with the first three and difficult to interpret (i.e., the factor mostly consisted of items that were not conceptually cohesive, with loadings in the .20s and .30s), and on these grounds, it was excluded. We therefore settled on a three-factor solution.

With few exceptions, the rationally selected CDI and RCMAS items loaded onto the three factors in expected ways. Table 3 presents the results of a principal components analysis of the items, with an oblique rotation and three factors extracted (the results of a principal factor analysis and principal components analysis were quite similar; the latter were somewhat clearer, and accordingly, were chosen for presentation). As Table 3 shows, Factor 1 is a PA factor, made up of items associated with having fun, enjoyment, and experiencing happiness. Factor 2 is a general NA factor, consisting of items related to emotional distress (e.g., sadness, worry, fear, nervousness). Factor 3 is a Physiological Hyperarousal factor, indicated by items related to somatic arousal (e.g., trouble breathing, sweaty hands).

Quite importantly, regardless of whether two or three factors were extracted, the factor intercorrelation matrix revealed low correlations, at odds with a hierarchical arrangement of factors. (Table 4 presents the factor intercorrelations for the two- and three-factor solutions.) To formally assess the question of a hierarchical arrangement of factors, we conducted a Schmid–Leiman transformation, which allows estimation of the relative amounts of unique variance accounted for by the first-order factors, as compared to the common variance conveyed by a higher order factor (cf. D. A. Clark et al., 1994, pp. 646, 649–650). As depicted in Table 5, a Schmid–Leiman transformation of the two-factor solution was generally consistent with a nonhierarchical view, although a small higher order factor did emerge. The higher order factor accounted for 7% of total variance (as compared to 16% and 8% for the first-order factors), and the loadings of the items onto the higher order factor were generally in the low to moderate range. Thus, our findings from this analysis differ somewhat from those of D. A. Clark et al. (1994), in that a first-order, three-factor solution appeared indicated,

Table 4
Factor Intercorrelations for Two- and Three-Factor Solutions

Factor	1	2	3
Two-factor solution			
1. Positive Affect–Depression	—		
2. Negative Affect–Physiological Hyperarousal	−.18	—	
Three-factor solution			
1. Positive Affect	—		
2. Negative Affect	−.10	—	
3. Physiological Hyperarousal	−.16	.26	—

Table 5
Loadings of Selected CDI and RCMAS Items on First- and Higher Order Factors, in a Two-Factor Solution, After Schmid–Leiman Transformation

Measure and item	Higher Order Factor	First-Order 1	First-Order 2
1. CDI Item 4 ("have fun")	.31	.14	−.54
2. CDI Item 12 ("like being with people")	.28	.11	−.49
3. CDI Item 21 ("have fun at school")	.06	−.05	−.18
4. RCMAS Item 23 ("others happier than I")	.33	.26	−.45
5. CDI Item 1 ("sad")	.31	.58	−.08
6. CDI Item 10 ("feel like crying")	.38	.38	−.45
7. CDI Item 11 ("things bother me")	.31	.41	−.26
8. RCMAS Item 6 ("worry a lot")	.33	.53	−.18
9. RCMAS Item 7 ("afraid")	.16	.59	.25
10. RCMAS Item 9 ("get mad")	.24	.09	.44
11. RCMAS Item 10 ("worry what parents say")	.26	.61	.05
12. RCMAS Item 14 ("worry what others say")	−.03	.09	.15
13. RCMAS Item 30 ("worry when go to bed")	.34	.54	−.19
14. RCMAS Item 34 ("nervous")	.18	.51	.13
15. RCMAS Item 37 ("worry about something bad")	.20	.34	−.10
16. RCMAS Item 5 ("trouble getting breath")	.09	.34	.15
17. RCMAS Item 17 ("feel sick in stomach")	.22	.29	−.18
18. RCMAS Item 19 ("hands feel sweaty")	.23	.42	−.07
Variance accounted for	6.56%	15.6%	8.2%

Note. PA = Positive Affect; NA = Negative Affect; CDI = Children's Depression Inventory; RCMAS = Revised Children's Manifest Anxiety Scale.

whereas a two-factor first-order solution with a third, hierarchical factor obtained somewhat less support.

In summary, our factor analyses indicated a three-factor structure of PA, NA, and Physiological Hyperarousal. Furthermore, our results suggested that a nonhierarchical arrangement of factors may be preferable, although a small, higher order factor did emerge.

Correlations Between Item-Based Factors and PANAS PA and NA

To provide a further test of the tripartite model, we hypothesized that the PANAS PA subscale would correlate more highly with the item-based PA factor than with the other two item-based factors and that the PANAS NA subscale would correlate more highly with the item-based NA subscale than with the other two item-based factors. As can be seen in Table 6, these predictions were well supported.

Specifically, the correlation between the PANAS PA subscale and the item-based PA subscale (.61) was significantly higher than the correlations of the PANAS PA subscale with the item-based NA (−.12) and Physiological Hyperarousal (−.19) factors; for significance of difference between dependent correlations, $t(113) = 6.61$ and $t(113) = 7.97$, respectively, $ps < .001$. Similarly, the correlation between the PANAS NA subscale and the item-based NA subscale (.54) was significantly higher than the correlation of the PANAS NA subscale with the item-based PA factor (−.21); for significance of difference between dependent correlations, $t(113) = 6.50$, $p < .001$. In addition, the correlation between the PANAS NA subscale and the item-based NA subscale (.54) was higher than the correlation of the PANAS NA subscale with the item-based Physiological Hyperarousal factor ($r = .36$), and this difference approached statistical significance, $t(113) = 1.94$, $p < .10$. In past work on the tripartite model, as in the present study, Physiological Hyperarousal and NA have shown the closest relation of any of the three components (e.g., L. A. Clark & Watson, 1991).

In summary, the intercorrelations between the PA and NA subscales of the PANAS, on the one hand, and the item-based PA, NA, and Physiological Hyperarousal factors on the other, reveal additional support for the tripartite model. The correlations converge and diverge in predicted directions.

Discussion

The tripartite model of depression and anxiety represented a good fit to data generated by child and adolescent psychiatric inpatients. This finding supports the hypothesis that depression and anxiety overlap and that the area of overlap represents generalized NA, but furthermore, that depression and anxiety are distinguishable despite the overlap. The basis for distinction rests in the specific components of each syndrome: Anhedonia for depression; Physiological Hyperarousal for anxiety.

Our analyses indicated that a three-factor, first-order solution may be preferable to one that includes a third factor in a hierarchically superordinate position. Thus, our study mirrors an

Table 6
Correlations of PANAS PA and NA With Item-Based CDI/RCMAS Measures of PA, NA, and Physiological Hyperarousal

Factor	PANAS PA	PANAS NA
1. PA	.61*	−.21
2. NA	−.12	.54*
3. Physiological Hyperarousal	−.19	.36*

Note. CDI = Children's Depression Inventory; RCMAS = Revised Children's Manifest Anxiety Scale; PANAS = Positive Affect Negative Affect Schedule; PA = Positive Affect subscale; NA = Negative Affect subscale.
* $p < .05$.

emerging issue in the literature on the tripartite model. Consistent with the theoretical work (e.g., L. A. Clark & Watson, 1991) and with the findings of Watson, Clark, et al. (1995), Jolly and Dykman (1994), and D. A. Clark et al. (1994), we obtained support for a three-factor model. By the same token, somewhat at odds with the hierarchical view, our Schmid–Leiman transformation did not reveal a strong second-order factor.

Gorsuch (1983) stated: "There is nothing sacred about either primary or higher order factors. The importance of each lies in its relative merits for the theory under construction" (p. 254). An important issue for the field is to determine these "relative merits." For two reasons, we incline toward viewing the three components of the tripartite model at the same level of abstraction (i.e., nonhierarchically). First, our data are somewhat more supportive of a nonhierarchical view. Second, from a conceptual standpoint, the hierarchical view can be interpreted as placing NA in a position of primacy, on par with that attributed to *g* in its relation to the components of intelligence. Unlike *g*, however, NA has not earned this position—specific depression and specific anxiety are not mere subsets of NA. Indeed, it is a main point of the tripartite model to set specific depression and specific anxiety apart from general NA.

A statistically hierarchical arrangement, such as that reported by D. A. Clark et al. (1994), does not require that one component be assigned primacy, because all components are orthogonalized by the Schmid–Leiman procedure; furthermore, as Gorsuch (1983) pointed out, it is theory, not statistical procedure, that assigns conceptual meaning to the arrangement of factors. Thus, in the presence of an interpretable first-order tripartite solution, we question the "relative merits" of a hierarchical solution—like the one displayed in Table 5—that is statistically defensible but which, conceptually, adds little explanatory power beyond the first-order solution and which can be interpreted as contradictory to the theory it putatively supports. However, in situations like that reported by D. A. Clark et al. (1994) where a third factor—and it need not necessarily be the NA factor—may be embedded within the other two (e.g., because of measurement properties of observed indicators), a hierarchical solution adds clarity, as long as hierarchical primacy, if it exists, is assigned on the basis of theory and not on statistical procedure alone.

Of course, the "raw material" of a factor analysis—the items—has great sway over the final product. In our study, we attempted to identify relatively pure markers of PA, NA, and Physiological Hyperarousal, and this may have allowed us to identify three relatively distinct and nonhierarchically arranged factors, similar to the work of Watson, Clark, et al. (1995). The studies of D. A. Clark, Steer, and colleagues (D. A. Clark et al., 1994; Steer, Clark, Beck, and Ranieri, 1995) on the items of the Beck Depression and Anxiety Inventories may have produced a large, higher order NA factor because so many items in both inventories are heavily loaded with NA content (cf. Feldman, 1993).

That our factor analytic findings on youngsters mirror those on adults suggests that the structure of mood-related symptoms may not vary greatly with age. This suggestion is speculative at this point and represents an important area for future work. For example, it would be enlightening to discover whether a one- or two-factor model may be most suitable for very young children, whereas a more differentiated, three-factor model may be more applicable to adolescents and adults. To a degree, the findings of Strauss, Lease, Last, and Francis (1988) may contradict this possibility. These authors found that mood and anxiety disorders are more differentiated for younger than older children.

That the tripartite model was supported among youngsters is an important finding, for at least two reasons. First, differential diagnosis among youth is often difficult, both because youngsters are sometimes less capable of reporting and describing subjective distress, and because childhood disorders are often phenomenologically similar to one another. The tripartite model, and the attendant psychometric tools, offer a useful strategy for distinction, at least with respect to depression and anxiety.

Second, to our knowledge, the present study is one of the first to explore the structure of mood-related symptoms in youngsters. The current findings suggest that the relations of PA and NA to each other and to depression and anxiety may be similar to those found in adults and can be assessed using similar means, such as the revised PANAS. Currently, the revised PANAS should be viewed as a preliminary research tool (although we reiterate that there is reason to suspect that the scale is both reliable and valid), to be replaced by more refined and studied measures, such as Laurent et al.'s (1994) PANAS–Child Version.

Our findings have further implications for empirical and clinical work. Tests of psychological theories of depression, which often postulate specific relations between psychological constructs and depression versus other states, can benefit from the tripartite model and the current findings. Findings that apply to low PA but not to Physiological Hyperarousal can be said to possess symptom specificity (cf. Joiner, 1994, 1995).

Clinically, the tripartite model can be helpful to youngsters and their parents with regard to emotional education (see, e.g., Kendall et al., 1992). Consistent with cognitive approaches to the treatment of depression and anxiety, youngsters who understand the difference between depression, anxiety, and generalized NA may be able to better identify and alter the cognitions that precede these states. Also, as Kendall et al. suggested, there is some indication that anxiety may be a precursor to depression (cf. Alloy, Kelly, Mineka, & Clements, 1990; Dobson, 1985). Therefore, identification of "specific" anxiety may serve as a signal to take steps to avoid the onset of "specific" depression.

The tripartite model may also be useful to clinicians in understanding the bases of mood-related symptoms and behaviors in youngsters, especially those involving deficits (e.g., social skill deficits). Because youngsters sometimes experience difficulty in reporting and describing subjective distress, it is often difficult to discern the cause of a given deficit. For example, a child's social reticence may be due to a (depressotypic) lack of motivation or an (anxiotypic) fear of social interaction. The tripartite model may serve as an arbiter in such cases (see Kendall et al., 1992; Stark, Rouse, & Livingston, 1991, for detailed discussion of treatment issues).

In closing, some cautions and considerations are noted. First, the sample size of the present study was moderate, and future researchers are encouraged to examine the tripartite model in youngsters in larger samples. Second, the issue of common method variance deserves consideration. In one sense, the present study does not suffer greatly from this problem, in that

items from two measurement tools were used, and their items "cross-loaded" (i.e., RCMAS and CDI items appeared on both the PA factor and the NA factor). On the other hand, our study, like those of Watson, Clark, et al. (1995), D. A. Clark et al. (1994), and Jolly and Dykman (1994), relied solely on self-report, and it would be interesting to determine whether the model would receive support if more varied measurement approaches were used (e.g., self-report, parent report, clinician ratings). Future researchers are urged to attend to this issue in attempts to build on the present supportive findings—and to continue to examine, both conceptually and statistically, the nonhierarchical versus hierarchical issue—regarding the tripartite model of depression and anxiety in children and adolescents.

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