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A Test of the Tripartite Model of Depression and Anxiety in Older Adult Psychiatric Outpatients

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This study examined the tripartite model of depression and anxiety in 131 psychiatric outpatients, ages 55–87. Confirmatory factor analyses revealed that a 3-factor model provided an adequate fit to the observed data, that the 3-factor model was empirically superior to 1- or 2-factor models, and that the 3-factor structure obtained in the current sample of older adult outpatients converged with that obtained on a separate, younger sample. Negative affect was significantly related to depression and anxiety symptoms and syndromes, and positive affect was more highly related to depression than anxiety symptoms and syndromes. Ways for taking into account possible age-associated differences in emotion in older adults and thus improving the conceptual model of anxiety and depression are briefly noted.

Despite considerable research on depression in older adults (Gallo, Anthony, & Muthén, 1994; Kessler, Foster, Webster, & House, 1992; Lebowitz et al., 1997; Zeiss, Lewinsohn, Rhode, & Seeley, 1996), limited attention has been given to anxiety (De Beurs et al., 1999; Krasucki, Howard, & Mann, 1998; Pearson, 1998; Stanley, Roberts, Bourland, & Novy, 2001) or the comorbidity of anxiety and depression in this population (Kim, Braun, & Kunik, 2001; Lenze et al., 2000; Livingston, Watkin, Milne, Manela, & Katona, 1997; Parmelee, Katz, & Lawton, 1993). Although epidemiological studies have found that the prevalence of anxiety and depression disorders decreases with age (Myers et al., 1984), research on clinical samples suggests there is considerable occurrence of anxious and depressive symptoms (Kim et al., 2001; Lenze et al., 2000). Even as most studies of anxiety and depression in older adults document a relationship between the two, only recent evidence is beginning to unravel how they are unique and how they overlap (Shapiro, Roberts, & Beck, 1999; Wetherell, Gatz, & Pedersen, 2001).

In the past decade, many studies examining the differentiation and similarity of depression and anxiety in younger populations have focused on the tripartite model (Clark & Watson, 1991). This model suggests that there is an overlap in anxiety and depression due to a common distress factor referred to as negative affect. Negative affect (NA) is characterized by a proclivity to be distressed, generally upset, and self-critical. The tripartite model also postulates that anxiety and depression can be differentiated by two other dimensions, positive affect and physiological hyperarousal. Positive affect (PA) is reflected by pleasurable engagement with the environment and energy, and a lack of PA is hypothesized to be relatively specific to depression. Physiological hyperarousal (PH) is reflected by somatic tension (e.g., shortness of breath, dizziness) and is thought to be relatively specific to anxiety.

The tripartite model has been supported in child, adolescent, college student, adult, and psychiatric in- and outpatient populations (Brown, Chorpita, & Barlow, 1998; Chorpita, Albano, & Barlow, 1998; Joiner, 1996; Joiner, Catanzaro, & Laurent, 1996; Watson et al., 1995). NA has been shown to be a nonspecific factor to depression and anxiety. NA has been demonstrated to be strongly related to symptoms and diagnoses of both anxiety and depression (Ahrens & Haaga, 1993; Dyck, Jolly, & Kramer, 1994; Jolly, Dyck, Kramer, & Wherry, 1994; Tellegen, 1985; Watson, Clark, & Carey, 1988). PA has been shown to be relatively unique to depression and therefore a good discriminator between depression and anxiety. PA has been consistently negatively correlated with symptoms and diagnoses of depression but largely unrelated to symptoms and diagnoses of anxiety (Ahrens & Haaga, 1993; Dyck et al., 1994; Jolly et al., 1994; Tellegen, 1985; Watson, Clark, & Carey, 1988). Some have shown that anxious arousal is a unique component of anxiety (Tellegen, 1985; Watson, Clark, & Carey, 1988). However, some research suggests that PH, although somewhat characteristic of all anxiety disorders, is particularly related to panic disorder (Brown et al., 1998; Mineka, Watson, & Clark, 1998). An excellent review of the tripartite model in its current, revised form is presented elsewhere (Mineka et al., 1998).

Positive and negative affectivity were examined in a sample of community-dwelling older adults who were recruited from active senior centers (Shapiro et al., 1999). Partially consistent with the tripartite model, NA was strongly related to anxious symptoms but

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only weakly associated with depressive symptomatology, whereas PA was weakly associated with both. The older adults in this sample were relatively asymptomatic, and their scores on the depression and anxiety symptom measures were restricted. Thus, these findings may not generalize to the underlying structures of depression and anxiety in a psychiatrically distressed older adult population.

Another reason that further examination of the tripartite model in older adults is important is that the clinical presentation of anxiety and depression in older adults may be different from the manifestation of these disorders in younger populations. For example, PH may be the consequence of medical conditions or medications, which may make it less valuable as a gauge of anxiety in late life. Additionally, decreased PA may indicate fatigue rather than depression for older people. The findings from this study may help in the improvement of diagnosis or more appropriate assessments for use with older adults.

The purpose of this study was to establish that a tripartite factor structure exists in a clinical sample of older adults, that this structure fits observed data better than other structures (e.g., one- or two-factor models), and that this structure converges with that already demonstrated in other samples (e.g., young adults). Moreover, this study examines the relations of the tripartite dimensions to formal Axis I diagnoses—this has seldom been done in the literature as a whole (for exceptions, see Brown et al., 1998; Joiner et al., 1996; Watson, Clark, & Carey, 1988) and has never been examined in older adults. Thus, the relationship of PA, NA, and PH to symptoms and diagnoses of depression and anxiety was examined in a clinical older adult patient population. Considering the tripartite model, we tested the following hypotheses in this sample of older adults: (a) NA would be strongly correlated with the symptoms and diagnoses of both anxiety and depression; (b) PA would be negatively correlated with symptoms and diagnoses of depression and less strongly related to symptoms and diagnoses of anxiety; and (c) PH would be positively correlated with a diagnosis of anxiety and less strongly related to a diagnosis of depression.[1]

Method

Patients

The data for this study were obtained as part of a comprehensive intake evaluation for older adult psychiatric outpatients at the Nova Community Clinic for Older Adults (NCCOA) located in south Florida. NCCOA is a community-based psychiatric outpatient facility for nonpsychotic adults aged 55 years and older. There were 244 consecutive admissions to the clinic from January 1995 through May 1997. As described in the *Procedure* section below, all patients at the NCCOA clinic were approached in person on their initial visit by the clinician assigned to their care to complete an intake battery. This battery consisted of several self-report measures and a structured diagnostic interview. Most patients completed the battery at intake, though some took a couple of weeks to do so. For a variety of logistic reasons, not all of the clients participated (i.e., a significant minority dropped out of treatment after the first session, though some refused to fill out the measures and some did not complete the measures in their entirety). Out of the 244 admissions, 151 clients completed the measures used here, indicating a 62% participation rate. Five were excluded from the sample because their records indicated they were under age 55. Another 15 patients were excluded from analyses owing to one or more missing measures. The final sample was composed of 131 psychiatric outpatients, 35 men (26.7%) and 96 women (73.3%).

The mean age for outpatients was 63.89 years ($SD = 8.0$), with a range from 55 through 87. The majority were Caucasian (94.5%), with 3.9% Black and 1.6% Hispanic. Most of the patients were married (34.4%) or divorced (29.7%), with a significant minority widowed (25.8%) and the remainder never married (6.3%) or separated (3.9%). Patients resided in condominiums and apartments (56.1%), private homes (41.3%), and boarding homes (1.8%). Patients' social class, as measured by the Hollingshead (1975) four-factor index, was generally in the middle levels (84.7), with 6.9% in the lowest socioeconomic status level and 8.5% in the highest.

Procedure

As part of a comprehensive intake evaluation, every NCCOA patient was approached in the waiting room at the time of their first appointment by their assigned doctoral-level graduate student therapist with a self-report assessment packet. This packet contained approximately six brief measures including the three that were used for this study. Patients were asked to complete the packet prior to meeting with their therapist to conduct the diagnostic interview. Although the majority of patients were able to complete this part of the assessment procedure in a timely fashion, some were not able to do so. Thus, they were asked to complete their packet at home or in the office prior to the next appointment. Although the patients generally filled out the self-report measures in the waiting room, there were some who were visually impaired, and so the clinicians read them the measures. All measures were completed within an initial evaluation time of 2 weeks and prior to the initiation of treatment. Master's-level clinicians working toward their doctoral degrees in clinical psychology, all of whom were trained in its administration, conducted the Structured Clinical Interview for *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition.* All patients signed consent forms for study participation.

Measurements

To measure the dimensions of PA and NA, we used the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20-item self-report measure that consists of two sets of 10 adjectives each, one measuring PA and the other measuring NA. Instructions were included to measure a state version of the PANAS. For each adjective, patients were advised to respond "to what extent you have felt this way during the past few weeks." Little is known about the psychometric properties of this tool. In this sample, both the PA and NA scales showed good internal consistency as demonstrated by coefficient alpha ($\alpha = .89$ and $\alpha = .89$, respectively).

The Beck Anxiety Inventory (BAI; A. T. Beck, Epstein, Brown, & Steer, 1988) was used to assess severity of anxiety symptoms. The BAI is a 21-item self-report measure of anxiety. Previous studies have indicated that the BAI is a reliable and valid measure of anxious symptoms for older populations (Kabacoff, Segal, Hersen, & Van Hasselt, 1997; Wetherell & Areán, 1997). The BAI demonstrated high internal consistency in the present sample as demonstrated by Cronbach's coefficient alpha ($\alpha = .94$).

The Beck Depression Inventory (BDI; A. T. Beck & Steer, 1987) was used to assess the severity of depressive symptoms. The revised BDI is a 21-item self-report measure of cognitive, affective, and somatic symptoms of depression. Individuals were instructed to choose the statement that best described the way they felt during the past week. Previous studies have indicated that the BDI is a reliable (Gallagher, Nies, & Thompson, 1982) and valid (Gallagher, Breckenridge, Steinmetz, & Thompson, 1983) measure of depressive symptoms for older populations. In the present sample

[1] For this study, the index of PH was derived from the anxiety symptom measure (BAI); therefore, it was not appropriate to examine the relation of PH to BAI symptoms (but the relation of PH to diagnoses is unaffected by this issue and was examined).

of older adult psychiatric outpatients, coefficient alpha was .87, indicating moderate to high internal consistency.

The diagnostic evaluation was conducted using the Structured Clinical Interview for *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition*, patient edition with psychotic screen (SCID–IV–P; American Psychiatric Press, 1994), a structured interview to determine *DSM–IV* diagnoses (American Psychiatric Association, 1994). This interviewing tool was used to determine current Axis I diagnoses. Master's-level clinicians working toward their doctoral degrees in clinical psychology administered all SCID–IV interviews.

Diagnostic reliability of the SCID–IV was examined in a mixed inpatient ($N = 9$) and outpatient ($N = 24$, all from NCCOA) sample of older adults (Segal, Hersen, Van Hasselt, Kabacoff, & Roth, 1993). SCID–IV interviews were videotaped or audiotaped, and a doctoral-level psychologist served as the independent reliability assessor for each interview. Interrater agreement as evidenced by the kappa and percentage agreement statistics showed adequate interrater agreement for major depression and anxiety disorders. Kappa values were .70 for major depression and .77 for anxiety disorders. Percentage agreement statistics were 85% and 94%, respectively.

Table 1 contains the diagnostic characteristics of this sample, including the percentage of the sample who fell into the diagnostic categories within type. Of the 131 patients in this study, 129 (97.0%) met criteria for an Axis I mental disorder. Fifty-three (40.5%) patients met *DSM–IV* criteria for a depressive disorder; 28 (21.4%) patients met *DSM–IV* criteria for an anxiety disorder; 44 (33.6%) met criteria for a mood disorder and an anxiety disorder; and 4 (3.1%) met criteria for other Axis I mental disorders. Consistent with Watson, Clark, and Carey (1988), when analyzing the data on diagnostic categories, patients were included in a diagnostic category if they met criteria for that disorder regardless of any other diagnoses they had.

Table 1
Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition Diagnoses of Sample

Diagnosis	*n*	% of total
Depressive disorder	53	40.5
Major depression	29	22.1
Dysthymia	4	3.1
Double depression	7	5.3
Bipolar disorder (most recent episode depressed)	3	2.3
Adjustment disorder with depressed mood	7	5.3
Mood disorder NOS	1	0.8
Depression NOS	2	1.5
Anxiety disorder	28	21.4
Generalized anxiety	5	3.8
Posttraumatic stress	1	0.8
Specific phobia	3	2.3
Panic disorder	8	6.1
Social phobia	1	0.8
Obsessive–compulsive	1	0.8
Anxiety NOS	7	5.3
Adjustment disorder with anxious mood	2	1.5
Anxiety and depressive disorder	44	33.6
Mood disorder with panic	10	7.6
Mood disorder with GAD	19	14.5
Mood disorder with PTSD	5	3.8
Mood disorder with phobia	3	2.3
Mood disorder, panic, and GAD	2	1.5
Mood disorder, panic, and PTSD	2	1.5
Adjustment with mixed anxiety and depressed mood	3	2.3
Other Axis I mental disorder	4	3.0
No Axis I mental disorder	2	1.5
Total	131	100.0

Note. NOS = not otherwise specified; GAD = generalized anxiety disorder; PTSD = posttraumatic stress disorder.

Results

Descriptive Statistics

Means, standard deviations, and intercorrelations of the measures are presented in Table 2.[2] As can be seen there and as would be expected given the outpatient nature of our sample, the mean BDI and BAI scores indicated a moderate level of depressive and anxious symptoms. Other features of Table 2 are elaborated below in the section *Relations of Tripartite Dimensions to Anxious and Depressive Symptoms and Diagnoses.*

Confirmatory Factor Analyses

We conducted confirmatory factor analyses using the structural equations modeling package EQS, Version 5.7b (Bentler, 1998). Confirmatory factor analyses using structural equations modeling allows one to specify, a priori, a theoretical model (such as that depicted in the figures) and to statistically evaluate the fit of the model to the actual observed data. One way to statistically evaluate models is through fit indices; indices with a value of .90 or greater are usually viewed as representing at least adequate fit.

First, we wanted to demonstrate that a three-factor structure of PA, NA, and PH represented a reasonable fit to the observed data. To do this, we tested the model depicted in Figure 1. As can be seen there, PA, NA, and PH factors were each defined by three items.[3,4] It should be noted that in none of the analyses did we allow covariance of error residuals; had we done so, fit statistics would have been better still. It should also be noted that the covariance matrix (not the correlation matrix) was analyzed. There were no missing values or outliers, and the method of estimation was maximum likelihood. No Heywood cases or other problems with the solutions occurred in any of the analyses (readers unfamiliar with structural equations modeling and the terms *covariance of error residuals* and *Heywood cases* are referred to the very accessible treatments of structural equations modeling in Byrne, 1994, and Schumacker & Lomax, 1996).

The three-factor model did, in fact, provide an adequate fit to the data among these participants. The nonnormed fit index was .91, the comparative fit index was .93, and the goodness-of-fit index was .92. All of these fit indices reflect at least adequate fit. The chi-square statistic associated with this model was 54.54 ($df = 24$, $N = 131$). Each item was a significant indicator of its respective factor, and, in line with several previous studies, the three factors

[2] These correlations looked similar when patients comorbid for depression and anxiety were excluded.

[3] Three items per factor were selected so that the total number of parameters for the model would remain within the rule-of-thumb guideline of at least 5 participants per parameter. These particular items were selected because they are clear exemplars, both conceptually and empirically, of the three factors.

[4] We reran the analysis using a new set of three BAI PH items (i.e., feelings of choking; face flushed; sweating not due to heat). Using these three new items, again the three-factor model provided an adequate fit to the data.

Table 2
Means, Standard Deviations, and Intercorrelations of Measures

Measure	1	2	3	4	5
1. BDI	—				
2. BAI	.59***	—			
3. PA	−.54***	−.21*	—		
4. PH	.54***	—[a]	−.13	—	
5. NA	.67***	.63***	−.35***	.51***	—
Anxiety disorder	.01	.26**	.12	.25**	.17*
Depressive disorder	.47***	.12	−.27**	.12	.27**
M	20.18	18.41	26.31	2.30	27.86
SD	10.15	13.47	8.69	2.47	9.51

Note. BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory; PA = positive affect; PH = physiological hyperarousal; NA = negative affect. Anxiety disorder = *DSM–IV* diagnosis of anxiety disorder or anxiety disorder and depressive disorder; depressive disorder = *DSM–IV* diagnosis of depressive disorder or anxiety and depressive disorder (these two diagnostic categories are scored dichotomously: 0 = absent, 1 = present.
[a] See footnote 1; PH is derived from BAI items.
* $p < .05$. ** $p < .01$. *** $p < .001$.

were intercorrelated (NA – PA parameter = −.53; NA – PH parameter = .55; PA – PH parameter = −.38; see model parameters in Figure 1). Each observed variable loaded onto its respective factor in the expected direction, and each was a significant indicator of its respective factor; this was true for this and for subsequent analyses.

Next, we assessed whether the three-factor model depicted in Figure 1 outperformed a two-factor model (depicted in Figure 2) as well as a one-factor model (not depicted; model includes all items loading on one factor). Regarding the two-factor model, fit was relatively poor. The nonnormed fit index was .74, the comparative fit index was .82, and the goodness-of-fit index was .84. All of these fit indices reflect inadequate fit. The chi-square statistic associated with this model was 113.02 ($df = 25$, $N = 131$).

Regarding the one-factor model, here too fit was relatively poor. The nonnormed fit index was .52, the comparative fit index was .64, and the goodness-of-fit index was .74. All of these fit indexes reflect inadequate fit. The chi-square statistic associated with this model was 203.04 ($df = 27$, $N = 131$).

On the basis of these results, it appears that a three-factor structure represents an adequate description of the observed data among our sample of older adult psychiatric outpatients. But is the three-factor structure obtained on this sample similar to that obtained on other samples (e.g., young adults)? To address this question, we compared factor-analytic results from the current older adult sample with results generated from a younger adult sample (described in part in Voelz et al., 2001).[5]

Regarding the younger adults from Voelz et al. (2001), participants included 63 undergraduates, ages 18 to 47 ($M = 19.29$, $SD = 3.82$), from a large state university. The majority were Caucasian (49 of 63; 78%), 8 were African American (13%), 4 were Hispanic (6%), 1 was Native American (2%), and 1 was classified as other (2%). All participants were recruited from psychology courses and agreed to receive course credit for study participation. Inclusion criteria were that participants were right-handed (important for the purpose of the Voelz et al. study) and that they completed all relevant measures at two time points.

First, a multisample analysis using EQS was conducted, which is an appropriate procedure for comparing various parameters across two or more samples (Bentler & Wu, 1995). Essentially, the procedure allows evaluation of whether configural invariance (similarity in factor loading patterns), metric invariance (constraining the factor loadings to be equal across groups), and complete or full invariance (constraining the factor loadings, covariances, and variances to be equal across groups) are present. The approach is an extension of the single-sample technique used above, and many of the same fit indices are used to reflect the degree of invariance, with fit indices approaching 1.0 representing invariance.

We tested invariance sequentially. We first ran an analysis in which the between-sample factor loadings were constrained to be equal. Then, we ran an analysis in which the between-sample factor loadings, factor variances, and factor covariances were constrained to be equal. Finally, we ran an analysis in which the between-sample factor loadings, factor variances, factor covariances, and measurement errors were all constrained to be equal. A substantial decrease in fit as more constraints are added indicates inequality of model parameters between samples. In addition to fit statistics used earlier, we calculated the parsimony normed fit index (PNFI; James, Mulaik, & Brett, 1982). As more constraints are added to the model, PNFI values should increase if between-sample invariance is present. As seen in Table 3, evidence supported between-sample invariance. As constraints were added, fit remained adequate, and PNFI values increased noticeably.

Relations of Tripartite Dimensions to Anxious and Depressive Symptoms and Diagnoses

As seen in Table 2, the correlations of PA, NA, and PH with BAI and BDI total scores and with anxiety and depressive diagnostic status were reasonably consistent with the tripartite model. Specifically, NA was strongly correlated with both BDI and BAI total scores. The difference between these dependent correlations was not significant, $t(128) = 0.73$, *ns.* PA had a stronger inverse correlation with the BDI than the BAI. The two correlations were significantly different, $t(128) = 4.96$, $p < .001$.

Also shown in Table 2 are the correlations between PA, NA, and PH and SCID–IV-derived diagnoses. Consistent with symptom data, NA was related to both anxiety and depressive disorders [correlations did not differ from each other; $t(128) = 1.17$, *ns*]. Consistent with the tripartite model, PH was more associated with anxiety than with depressive disorders, although the difference between correlations did not achieve statistical significance, $t(128) = 1.32$, *ns.* Also consistent with the tripartite model, PA was inversely correlated with presence of a depressive disorder but was not significantly related to presence of an anxiety disorder [correlations were significantly different; $t(128) = 3.61$, $p < .001$].

Discussion

The tripartite model of depression and anxiety was examined in an older clinical adult population. First, confirmatory factor analyses revealed that a three-factor model provided an adequate fit to

[5] Voelz et al. (2001) focused on women only; in the current analyses, women and men were included.

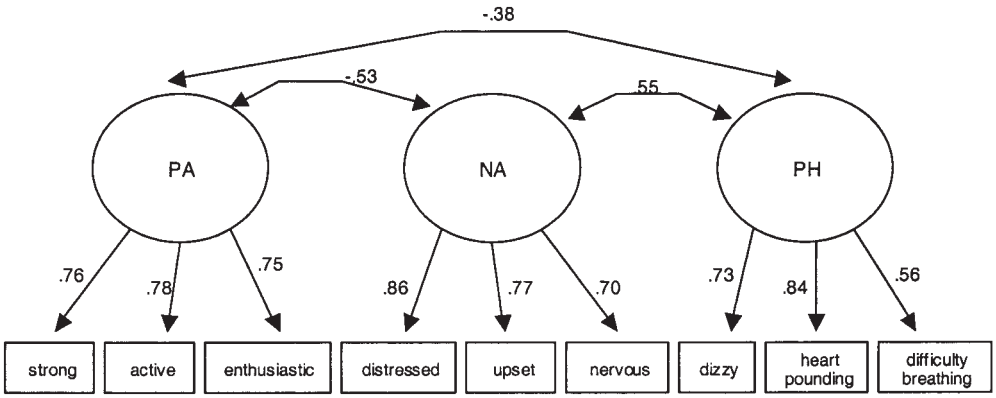

Figure 1. Results of confirmatory factor analysis of the three-factor tripartite model of depression and anxiety in older adults. PA = positive affect; NA = negative affect; PH = physiological hyperarousal.

the observed data, that the three-factor model was empirically superior to rival models, and that the three-factor structure obtained in the current sample of older adult outpatients converged with that obtained on a separate, younger sample. These results are consistent with previous research on the tripartite model in which support was found for a three-factor model (Joiner, 1996; Joiner et al., 1996; Jolly & Dykman, 1994). Moreover, this study is one of just a few that used confirmatory techniques and between-sample analyses and is the first to systematically examine these issues among a clinical sample of older adults.

A second main goal of the study was to assess the relation of tripartite dimensions to syndromal and nosologic depression and anxiety. On the basis of the tripartite model and prior work with younger populations, it was hypothesized that NA would be significantly related to depression and anxiety symptoms and syndromes and PA would be more highly related to depression than anxiety symptoms and syndromes. In each case, the results supported predictions. It was further hypothesized that PH would relate more to anxiety than to depressive disorders. Although the correlation of PH with anxiety disorder status exceeded the correlation of PH with mood disorder status, these correlations were not significantly different from one another. In this study, then, PA was a better discriminator between depressive and anxiety disorders than was PH. This may be because PA is a clear marker of depressive syndromes, whereas PH is more of a marker for some anxiety syndromes than for others (Brown et al., 1998). Indeed, the reconceptualization of the tripartite model (Mineka et al., 1998) states that PH is particularly characteristic of panic disorder, and the low occurrence of panic disorder in the present sample may have accounted for this outcome. Another possibility is that PH loses specificity to anxiety disorders with age. Indeed this is an interesting avenue for future research.

Our findings are more consistent with the tripartite model than were those of recent investigations (J. G. Beck et al., 2003; Shapiro et al., 1999; Wetherell et al., 2001). In a large data set, Wetherell et al. (2001) examined depression and anxiety symptoms in a nonclinical sample of middle-aged and older adults. Items were extrapolated from the Center for Epidemiologic Studies–Depression scale (Radloff, 1977) and the State Anxiety subscale of the State–Trait Personality Inventory (Spielberger, 1979, 1983) to form positive affect (i.e., well-being and peace of mind) and negative affect (i.e., depressed and anxious mood, interpersonal difficulties, psychomotor and somatic symptoms) scales. The authors compared the fit of a two-factor (positive and negative affect) model with several other models and concluded that a model with distinct anxiety and depression factors fit the data better than a two-factor positive and negative affect one. This is a common finding when items from general depression and anxiety scales are

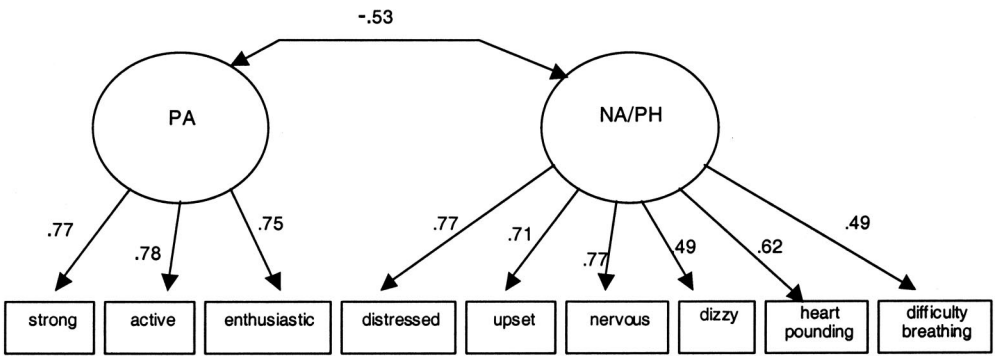

Figure 2. Results of confirmatory factor analysis of a two-factor model of depression and anxiety in older adults. PA = positive affect; NA = negative affect; PH = physiological hyperarousal.

Table 3
Fit Statistics for Unconstrained Multisample Model and for Equality Constrained Models

Model	χ^2	df	NNFI	CFI	GFI	PNFI
Unconstrained	89.92***	42	.89	.94	.92	
FL invariant	91.75***	51	.92	.95	.92	.63
FL, FCr, FV invariant	103.86***	57	.92	.94	.91	.69
FL, FCr, FV, ME invariant	117.01***	66	.93	.94	.90	.79

Note. NNFI = nonnormed fit index; CFI = comparative fit index; GFI = goodness-of-fit index; PNFI = parsimony normed fit index; FL = factor loadings; FCr = factor correlations; FV = factor variances; ME = measurement error.
*** $p < .001$.

used to indicate tripartite dimensions. By contrast, when more precise indices of tripartite dimensions are used, as in our study and that of Shapiro et al. (1999), models consistent with the tripartite view are supported. Interestingly, J. G. Beck et al. (2003) examined the factor structures of the PANAS in a sample of community-dwelling older adults with generalized anxiety disorder. Although evidence was found for a three-factor model, this model was different than tradition (i.e., one PA and two NA, with one reflecting anxiety and anger and the other guilt and shame).

In contrast to the present study, other investigators (J. G. Beck et al., 2003; Shapiro et al., 1999; Wetherell et al., 2001) obtained results consistent with the view that a low level of PA may not be as specific to depressive symptoms in older adults as in younger samples. Our findings led to the opposite conclusion. The differences between our findings and those of Shapiro et al. and Wetherell et al. may have occurred because our sample was psychiatrically distressed and recruited from a psychiatric outpatient clinic, whereas the other studies used nonclinical samples. However, J. G. Beck et al. (2003) did use a clinical sample but a homogeneous one, whereas ours was from a more diverse clinical population.

Although the results of this study indicate a better fit for the tripartite model than for two- or one-factor alternatives, the actual fit indices for the tripartite model (.91–.93) indicate that the fit can be improved upon. For example, the tripartite model posits that PH is not related to depressive symptoms, yet in this sample the correlation is .54, which is the same magnitude as the relationship between depressive symptoms and lack of PA. PA and NA are typically nearly orthogonal in younger samples, yet in the present study the correlation is −.35. Taken together, these results suggest that although the tripartite model may be superior to some models, it may not be entirely appropriate for older adults and thus may require revision to account for possible age-associated differences in the experience of emotion.

These findings possess research and clinical implications. On the basis of these data, PA may aid in the discrimination of symptomatology and taxonomy of anxiety and depression disorders in older adults. It has been suggested that to improve the differential diagnosis between anxiety and depression in younger adults, measurement of depression should be more heavily weighted toward the absence of PA (Watson et al., 1995). Loss of pleasure or absence of pleasurable engagement may be added to existing older adult depression measures or as a separate measure to help discriminate between anxiety and depression symptoms and syndromes in older populations.

The relationship between pleasurable engagement, or lack thereof, and clinical depression may have treatment implications. Behaviorally oriented treatments focused on reducing unpleasant events and increasing pleasurable engagement may help in the alleviation of clinical depression (Lewinsohn, Biglan, & Zeiss, 1976; Thompson, Gallagher-Thompson, & Dick, 1995). Encouraging depressed older outpatients to increase their engagement in pleasurable activities may be one way to help them feel less depressed. Results of this study are consistent with research that provides support for cognitive and behavioral approaches to the treatment of depression in older adults (for reviews, see Gatz et al., 1998, and Scogin & McElreath, 1994). The empirical evidence addressing the efficacy of psychological treatments for anxiety disorders in late life is limited (for a review, see Nordhus & Pallesen, 2003). Cognitive restructuring of arousal appraisals and behavioral interventions to reduce arousal in younger adults are worthy of application to treatment of anxious older adults.

The findings presented here must be interpreted within the limitations of the study. First, the outpatient sample used may not be representative of most older adult clinical populations. Many were retirees to south Florida, who were primarily Caucasian and living independently. Therefore, these results may not generalize to more seriously ill and functionally impaired older adults or to other racial or ethnic groups. In addition, this was a clinical sample and thus is not representative of older adult community dwellers. Research on more diverse and nonreferred samples of older adults will help determine the generalizability of these results.

A second concern is in the diagnostic reliability of the SCID–IV. Although administration of this instrument was conducted by doctoral-level graduate students in clinical psychology, all of whom were trained in its administration, we cannot entirely be assured of their acumen. Although we report on reliability of SCID–IV diagnoses in a subsample of patients from the NCCOA clinic, reliability of interview-based assessments is specific to the particular interviewers and the particular study. We did not conduct a reliability check within this sample, and this is noted as a limitation. A third possible constraint of the present study is the limited measure of PH. Although this issue should be considered, it should also be noted that Joiner et al. (1999) rigorously demonstrated the reliability and validity of subsets of BAI items as indices of PH. Fourth, the sample size of the study was relatively moderate. Along those lines, a 62% response rate is not ideal, and this is noted as a shortcoming. Last, the mean age of this sample was 64 years, making it a rather young older adult group. This study should certainly be replicated on older old samples.

One area in need of further exploration is the comorbid and mixed anxiety–depression category. This study addressed neither the co-occurrence of anxiety and depression disorders nor mixed anxiety–depression, and the relationship of PA and NA to these categories may shed more light on the relationships reported here. To develop and test a conceptual model of anxiety and depression that takes into account possible age-associated differences, future research should include information on physical health status and medical comorbidity. This would certainly represent a significant replication and extension of this work.

The findings highlight the need for continued research on individual differences on the way in which anxiety and depression are experienced in later life. NA occurred in both depression and anxiety symptoms and syndromes in older adulthood. PH was

more strongly related to anxiety than depressive disorders, but not to a significant degree. The lack of PA was more strongly related to depression than anxiety symptoms and disorders.

In sum, correlates that are unique to depression and anxiety in older adults may identify factors that will help improve their differential diagnosis and in turn aid in the recognition of these disorders. By defining associates of depression and anxiety in older adults, we may assist in the prognosis, management, treatment, and health care delivery to individuals who suffer from one or both of these psychopathologies.

References

Ahrens, A. H., & Haaga, D. A. F. (1993). The specificity of attributional style and expectations to positive and negative affectivity, depression and anxiety. *Cognitive Therapy and Research, 17,* 83–98.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Press. (1994). *The Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders—Fourth edition.* Washington, DC: Author.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety. *Journal of Consulting and Clinical Psychology, 56,* 893–897.

Beck, A. T., & Steer, R. A. (1987). *Manual for the revised Beck Depression Inventory.* San Antonio, TX: Psychological Corporation.

Beck, J. G., Novy, D. M., Diefenbach, G. J., Stanley, M. A., Averill, P. M., & Swann, A. C. (2003). Differentiating anxiety and depression in older adults with generalized anxiety disorder. *Psychological Assessment, 15,* 184–192.

Bentler, P. M. (1998). *EQS structural equations program manual.* Encino, CA: Multivariate Software.

Bentler, P. M., & Wu, E. J. C. (1995). EQS Windows user guide [Computer manual]. Encino, CA: Multivariate Software.

Brown, T. A., Chorpita, B. F., & Barlow, D. H. (1998). Structural relationships among dimensions of the *DSM–IV* anxiety and mood disorder and dimensions of negative affect, positive affect, and autonomic arousal. *Journal of Abnormal Psychology, 107,* 179–192.

Byrne, B. (1994). *Structural equation modeling with EQS and EQS/WINDOWS: Basic concepts, applications, and programming.* Thousand Oaks, CA: Sage.

Chorpita, N. F., Albano, A. M., & Barlow, D. H. (1998). The structure of negative emotions in a clinical sample of children and adolescents. *Journal of Abnormal Psychology, 107,* 74–85.

Clark, L. A., & Watson, D. (1991). A tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100,* 316–336.

De Beurs, E., Beekman, A. T. F., van Balkom, A. J. L. M., Deeg, D. J. H., van Dyck, R., & van Tilburg, W. (1999). Consequences of anxiety in older persons: Its effect on disability, well-being and use of health services. *Psychological Medicine, 29,* 583–593.

Dyck, M. J., Jolly, J. B., & Kramer, T. (1994). An evaluation of positive affectivity, negative affectivity, and hyperarousal as markers for assessing between syndrome relationships. *Personality and Individual Differences, 17,* 637–646.

Gallagher, D., Breckenridge, J., Steinmetz, J. L., & Thompson, L. W. (1983). The Beck Depression Inventory and research diagnostic criteria: Congruence in an older population. *Journal of Consulting and Clinical Psychology, 51,* 945–946.

Gallagher, D., Nies, G., & Thompson, L. W. (1982). Reliability of the Beck Depression Inventory with older adults. *Journal of Consulting and Clinical Psychology, 50,* 152–153.

Gallo, J. J., Anthony, J. C., & Muthén, B. O. (1994). Age differences in the symptoms of depression: A latent trait analysis. *Journals of Gerontology: Psychological Sciences, 49,* P251–P264.

Gatz, M., Fiske, A., Fox, L. S., Kaskie, B., Kasl-Godley, J. E., McCallum, T. J., et al. (1998). Empirically validated psychological treatments for older adults. *Journal of Mental Health and Aging, 4,* 9–46.

Hollingshead, A. F. (1975). *Four-factor index of social status.* Unpublished manuscript, Department of Sociology, Yale University.

James, L. R., Mulaik, S. A., & Brett, J. M. (1982). *Causal analysis: Assumptions, models, and data.* Beverly Hills, CA: Sage.

Joiner, T. E., Jr. (1996). A confirmatory factor-analytic investigation of the tripartite model of depression and anxiety in college students. *Cognitive Therapy and Research, 20,* 521–539.

Joiner, T. E., Jr., Catanzaro, S. J., & Laurent, J. (1996). Tripartite structure of positive and negative affect, depression, and anxiety in child and adolescent psychiatric inpatients. *Journal of Abnormal Psychology, 105,* 401–409.

Joiner, T. E., Jr., Steer, R. A., Beck, A. T., Schmidt, N. B., Rudd, M. D., & Catanzaro, S. (1999). Physiological hyperarousal: Construct validity of a central aspect of the tripartite model of depression and anxiety. *Journal of Abnormal Psychology, 108,* 290–299.

Jolly, J. B., Dyck, M. J., Kramer, T. A., & Wherry, J. N. (1994). Integration of positive and negative affectivity and cognitive content-specificity: Improved discrimination of anxious and depressive symptoms. *Journal of Abnormal Psychology, 103,* 544–552.

Jolly, J. B., & Dykman, R. A. (1994). Using self-report data to differentiate anxious and depressive symptoms in adolescents: Cognitive content specificity and global distress? *Cognitive Therapy and Research, 18,* 25–37.

Kabacoff, R. I., Segal, D. L., Hersen, M., & Van Hasselt, V. B. (1997). Psychometric properties and diagnostic utility of the Beck Anxiety Inventory and the State-Trait Anxiety Inventory with older adult psychiatric outpatients. *Journal of Anxiety Disorders, 11,* 33–47.

Kessler, R. C., Foster, C., Webster, P. S., & House, J. S. (1992). The relationship between age and depressive symptoms in two national surveys. *Psychology and Aging, 7,* 119–126.

Kim, H. F. S., Braun, U., & Kunik, M. E. (2001). Anxiety and depression in medically ill older adults. *Journal of Clinical Geropsychology, 7,* 117–130.

Krasucki, C., Howard, R., & Mann, A. (1998). The relationship between anxiety disorders and age. *International Journal of Geriatric Psychiatry, 13,* 79–99.

Lebowitz, B. D., Pearson, J. L., Schneider, L. S., Reynolds, C. F., III, Alexopoulos, G. S., Bruce, M. L., et al. (1997). Diagnosis and treatment of depression in late life: Consensus statement update. *JAMA, 278,* 1186–1190.

Lenze, E. J., Mulsant, B. H., Shear, M. K., Schulberg, H. C., Dew, M. A., Begley, A. E., et al. (2000). Comorbid anxiety disorders in depressed elderly patients. *American Journal of Psychiatry, 157,* 722–728.

Lewinsohn, P. M., Biglan, T., & Zeiss, A. (1976). Behavioral treatment of depression. In P. Davidson (Ed.), *Behavioral management of anxiety, depression and pain* (pp. 91–146). New York: Brunner/Mazel.

Livingston, G., Watkin, V., Milne, B., Manela, M. V., & Katona, C. (1997). The natural history of depression and anxiety disorders in older people: The Islington community study. *Journal of Affective Disorders, 46,* 255–262.

Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. In J. T. Spence, J. M. Darley, & D. J. Foss (Eds.), *Annual review of psychology* (pp. 377–412). Palo Alto, CA: Annual Reviews.

Myers, J. K., Weissman, M. M., Tischler, G. L., Holzer, C. E., III, Leaf, P. J., Orvaschel, H., et al. (1984). Six-month prevalence of psychiatric disorders in three communities. *Archives of General Psychiatry, 41,* 959–967.

Nordhus, I. H., & Pallesen, S. (2003). Psychological treatment of late-life

anxiety: An empirical review. *Journal of Consulting and Clinical Psychology, 71,* 643–651.

Parmelee, P. A., Katz, I. R., & Lawton, M. P. (1993). Anxiety and its association with depression among institutionalized elderly. *American Journal of Geriatric Psychiatry, 1,* 46–58.

Pearson, J. L. (1998). Research in late-life anxiety: Summary of a National Institute of Mental Health workshop on late-life anxiety. *Psychopharmacology Bulletin, 34,* 127–138.

Radloff, L. S. (1977). The CES–D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1,* 385–401.

Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modeling.* Mahwah, NJ: Erlbaum.

Scogin, F., & McElreath, L. (1994). Efficacy of psychosocial treatments for geriatric depression: A quantitative review. *Journal of Consulting and Clinical Psychology, 62,* 69–74.

Segal, D., Hersen, M., Van Hasselt, V. B., Kabacoff, R., & Roth, L. (1993). Reliability of diagnosis in older psychiatric patients using the Structured Clinical Interview for *DSM–III–R. Journal of Psychopathology and Behavioral Assessment, 15,* 347–356.

Shapiro, A. M., Roberts, J. E., & Beck, J. G. (1999). Differentiating symptoms of anxiety and depression in older adults: Distinct cognitive and affective profiles? *Cognitive Therapy and Research, 23,* 53–74.

Spielberger, C. D. (1979). *Preliminary manual for the State-Trait Personality Inventory (STPI).* Tampa: University of South Florida.

Spielberger, C. D. (1983). *Manual for the State-Trait Anxiety Inventory (Form Y).* Palo Alto, CA: Consulting Psychologists Press.

Stanley, M. A., Roberts, R. E., Bourland, S. L., & Novy, D. M. (2001). Anxiety disorders among older primary care patients. *Journal of Clinical Geropsychology, 7,* 105–116.

Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 681–706). Hillsdale, NJ: Erlbaum.

Thompson, L. W., Gallagher-Thompson, D., & Dick, L. P. (1995). *Cognitive-behavioral therapy for late life depression: A therapist manual.* Palo Alto, CA: Older Adult and Family Center, Veterans Affairs Palo Alto Health Care System.

Voelz, Z., Gencoz, F., Gencoz, T., Pettit, J., Perez, M., & Joiner, T. (2001). Patterns of hemispheric perceptual asymmetries: Left hemispatial biases predict changes in anxiety and positive affect in undergraduate women. *Emotion, 1,* 339–347.

Watson, D., Clark, L. A., & Carey, G. (1988). Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology, 97,* 346–353.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54,* 1063–1070.

Watson, D., Clark, L. A., Weber, K., Assenheimer, J. S., Strauss, M., & McCormick, R. A. (1995). Testing a tripartite model: II. Exploring the symptom structure of anxiety and depression in student, adult, and patient samples. *Journal of Abnormal Psychology, 104,* 15–25.

Wetherell, J. L., & Areán, P. A. (1997). Psychometric evaluation of the Beck Anxiety Inventory with older medical patients. *Psychological Assessment, 9,* 136–144.

Wetherell, J. L., Gatz, M., & Pedersen, N. L. (2001). A longitudinal analysis of anxiety and depressive symptoms. *Psychology and Aging, 16,* 187–195.

Zeiss, A. M., Lewinsohn, P. M., Rhode, P., & Seeley, J. R. (1996). Relationship of physical disease and functional impairment to depression in older people. *Psychology and Aging, 1,* 1572–1582.

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