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BRIEF REPORT

# DISCRIMINANT VALIDITY OF THE SCL-90 DIMENSIONS OF ANXIETY AND DEPRESSION

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Although the SCL-90 and other self-report measures of anxiety and depression have long been criticized for inadequate factor structure and unacceptably high correlations with each other, recent evidence indicates the use of homogeneous samples results in greatly improved discriminant validity. This study utilized homogeneous samples of anxious ( $N = 54$ ) or depressed ( $N = 120$ ) outpatients and a factor analysis was conducted on their responses to the depression and anxiety items on the SCL-90. Clearly separate factors for anxiety and depression emerged. Results are discussed with respect to implication for measures of depression and anxiety.

*Keywords:* Self-reports of anxiety and depression, SCL-90, Tripartite Model

In the psychological assessment literature there is ongoing interest as to how well the numerous self-report measures can discriminate between anxiety and depression. Literature reviews have consistently reported correlations of .50 or greater between the various self-report measures of anxiety and depression (Dobson, 1985; Gotlib & Cane, 1989; Watson & Kendall, 1989). Feldman (1993) used factor analytic techniques to analyze

data from numerous studies and concluded there was no evidence that such scales can discriminate between these moods.

Some researchers have maintained that the poor discriminant validity of these self-report measures is caused partially by a nonspecific factor common to both depression and anxiety (Clark & Watson, 1991; Steer, Clark, & Ranieri, 1994; Watson, Weber, Assenheimer, Clark, Strauss, & McCormick, 1995). These authors have contended that, although each of these two moods is characterized by some unique symptoms, both moods share nonspecific symptoms of general distress termed a Negative Affect factor. This "Tripartite Model" suggests that the data can be explained best with three symptom subtypes consisting of a Negative Affect factor of nonspecific symptoms of general

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distress along with symptoms which are specific to depression and anxiety.

Another explanation for the poor discriminant validity is the possibility that current measures are not sufficiently sensitive to detect the symptoms unique to each mood. In this regard, several researchers have proposed new scales or modifications to existing scales to improve the discriminant validity of these measures (Clark & Watson, 1991; Endler, Cox, Parker, & Bagby, 1992; Feldman, 1993; Watson et al., 1995). An example of this work is the reconstructed Hamilton Rating Scales (utilizing clinician ratings) which were revised to have less symptom overlap and greater discriminant validity (Riskind, Beck, Brown, & Steer, 1987).

A final possible explanation has to do with the samples used in past research. The samples have typically consisted of heterogeneous psychiatric patients or college students. Recently, there has been some evidence that, if homogeneous clinical samples are used, existing measures can, in fact, reliably differentiate between anxiety and depression. One such study compared the responses of a homogeneous sample of 298 anxiety disorder patients on self-reports of anxiety using the State-Trait Anxiety Inventory (STAI; Spielberger, 1983) and of depression using the Beck Depression Inventory (BDI; Beck, 1978) and found that clearly separate factors emerged for each mood (Cox, Swinson, Kuch, & Reichman, 1993). These authors concluded that "a similar factor-analytic study with unipolar depressed patients appears to be warranted" (p. 486).

The Symptom Checklist-90 (SCL-90; Derogatis, Lipman, & Covi, 1973) and the revised form (SCL-90-R) (Derogatis, 1992) are self-report measures which gauge psychological symptoms in nine primary dimensions (two of which are anxiety and depression) and provide three global indices of distress. The depression subscale consists of 13 items whereas the anxiety subscale consists of 10 items; yet scores on each subscale or dimension can range from 0 to 4 (the mean level of endorsement across scale items). Like other self-report measures, the SCL-90 and SCL-90-R have been

criticized for inadequate factor structure and poor discriminant validity. Clark and Friedman (1983) used a heterogeneous sample of psychiatric outpatients and found that most of the covariation on SCL-90 subscales could be accounted for by a single factor of global distress. Another study which utilized a heterogeneous sample of psychology clinic outpatients found that a single factor of depression accounted for 27% of the variance in the SCL-90-R scores, whereas only 5.1% was accounted for by the second factor. The authors concluded that such results indicate the SCL-90-R should be considered a measure of general dimensions of personality (Brophy, Norvell, & Kiluk, 1988).

Steer et al. (1994), using a sample of 900 outpatients with mixed psychiatric diagnoses, found that general distress accounted for 30.5% of the total variance found on the SCL-90-R. One literature review concluded that, because of the high intercorrelations between the symptoms dimensions, the high number of items that load on more than one factor, and the amount of variance accounted for by a single unrotated factor, the SCL-90 and SCL-90-R should be considered as measures of general distress as opposed to separate symptom dimensions (Cyr, McKenna-Foley, & Peacock, 1985). Another review concluded that although some data supports a dimension of the SCL-90 which measures depression, there is no evidence for a separate anxiety dimension as these items tend to be spread throughout the remaining factors or combine with depression scale items (Gotlib & Cane, 1989).

In summary, numerous studies support the position that self-reports of depression and anxiety are so highly intercorrelated that they are essentially indistinguishable. In terms of the SCL-90 and SCL-90-R, the nine subscales which gauge dimensions of psychopathology (including anxiety and depression) tend to be highly intercorrelated. Further, the existence of a separate SCL-90 anxiety factor has been questioned. There is, however, some recent evidence (Cox et al., 1993), based on a homogeneous sample of patients diagnosed with an anxiety disorder, to indicate that self-reports

can reliably differentiate between anxiety and depression. The purpose of the current study was twofold: (a) to replicate and extend the findings of Cox et al. (1993) by investigating the discriminant validity of a widely-used self-report measure in a sample of psychiatric outpatients who met *Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R*; American Psychiatric Association, 1987) diagnostic criteria for unipolar depression or an anxiety disorder, but not both, and (b) to determine whether a separate SCL-90 anxiety factor emerged when using such homogeneous samples.

## Method

The study participants consisted of 120 patients diagnosed with a mood disorder (87 women and 33 men) with a mean age of 36.7 years ( $SD = 9.3$  years) and 54 patients diagnosed with an anxiety disorder (35 women and 19 men) with a mean age of 36.3 years ( $SD = 8.9$  years). The sample consisted of outpatients recruited through various forms of mass media who volunteered to participate in drug studies utilizing double-blind research protocols.

Outpatients were screened with an initial telephone interview by a technician who reviewed psychiatric history, medical history, and current medications. Outpatients who were using psychoactive medications, had used illegal drugs within the past year, or had a previous diagnosis of schizoaffective disorder, schizophrenia, psychotic disorder, or bipolar affective disorder were excluded from the study.

Participants who passed the initial screening were then interviewed by an RN, who had several years experience screening patients for drug trials. The nurse obtained a detailed history, conducted a diagnostic interview, and administered the original versions of the Hamilton Anxiety (1959) and Hamilton Depression (1967) Rating Scales to each participant. Patients with a Hamilton Depression Rating Scale score of 20 or greater were diagnosed as depressed, whereas patients with a Hamilton Anxiety Rating Scale score of 20 or greater were diagnosed with an anxiety disorder.

Patients diagnosed with comorbid mood and anxiety disorders were excluded from this study.

Participants who met the above criteria were then interviewed by a psychiatrist who conducted a structured diagnostic interview using *DSM-III-R* criteria for unipolar depression or generalized anxiety disorder. The 120 mood disorder participants met *DSM-III-R* diagnostic criteria for unipolar depression, whereas the 54 anxiety disorder participants met *DSM-III-R* diagnostic criteria for generalized anxiety disorder. During the screening process all participants also completed the SCL-90 which was not used for diagnostic purposes.

## Results and Discussion

A principal-components analysis with varimax rotation was performed on the SCL-90 items comprising the depression and anxiety subscales. By only using components with eigenvalues of greater than one to decide the number of factors to extract, we initially identified six factors. However, four of these factors each contained only a few items and accounted for very little variance. In the resulting two-factor solution, which accounted for 41.7% of the total variance, all items loaded at .40 or greater on at least one of the factors. The results of this factor analysis are presented in Table 1.

Note that the first factor is comprised almost exclusively of the depression items. The second factor consists of the anxiety items as well as two of the depression items ("feeling of being caught or trapped" and "worrying too much about things"). Scores on the Depression and Anxiety subscales were correlated .38, hence the two scales shared only 14% of their variance (i.e.,  $R^2 = .14$ ).

As expected, the depression group scored significantly higher on the SCL-90 depression subscale ( $M = 2.33$ ,  $SD = 0.71$ ) than did the anxiety group ( $M = 1.81$ ,  $SD = 0.67$ ),  $F(1, 172) = 20.88$ ,  $p < .0001$ . Similarly, the anxiety group scored higher on the SCL-90 anxiety subscale ( $M = 1.91$ ,  $SD = 0.65$ ) than did the depression group ( $M = 1.36$ ,  $SD = 0.83$ ),  $F(1, 172) = 19.04$ ,  $p < .0001$ . After converting

Table 1  
 Rotated Factor Loadings of the SCL-90 Depression and Anxiety Subscale Items

SCL-90 Item	Factor 1	Factor 2
<b>Depression subscale items</b>		
Item No.		
5. Loss of sexual interest or pleasure	.35	—
14. Feeling low in energy or slowed down	.57	—
15. Thoughts of ending your life	.45	—
20. Crying easily	.44	—
22. Feeling of being caught or trapped	.44	.33
26. Blaming yourself for things	.54	—
29. Feeling lonely	.77	—
30. Feeling blue	.79	—
31. Worrying too much about things	.32	.44
32. Feeling no interest in things	.65	—
54. Feeling hopeless about the future	.74	—
71. Feeling everything is an effort	.61	—
79. Feelings of worthlessness	.73	—
<b>Anxiety subscale items</b>		
Item No.		
2. Nervousness or shakiness inside	—	.77
17. Trembling	—	.56
23. Suddenly scared for no reason	—	.64
33. Feeling fearful	.29	.64
39. Heart pounding or racing	—	.73
57. Feeling tense or keyed up	—	.67
72. Spells of terror or panic	—	.69
78. Feeling so restless you couldn't sit still	—	.63
Eigenvalue	5.91	2.85
% Total variance	28.1	13.6

Note.  $N = 174$ . Only items that loaded greater than .25 are listed.

these scores into percentiles, the anxiety group scored near the 50th percentile on depression but above the 70th percentile on anxiety. Likewise, the depression group scored near the 50th percentile on anxiety but above the 70th percentile on depression.

In factor analyzing self-reported symptoms of depression and anxiety in homogeneous samples, we found that two distinct factors emerged; one clearly consisted of the symptoms of depression whereas the other was comprised of typical symptoms of anxiety. The two depression subscale items which cross-loaded substantially on the

anxiety factor were “feeling of being caught or trapped” and “worrying too much about things.” The remaining depression items referred to negative self-evaluation, psychomotor retardation, anhedonia, suicidality, and dysphoric mood. The anxiety subscale items dealt primarily with the experience of sudden illogical fear or panic and signs of psychomotor agitation.

Our results are consistent with those of Cox et al. (1993) who used a homogeneous sample of patients diagnosed with anxiety disorder and found that anxiety and depression were distinguishable by self-report. It appears that the use of

mixed samples such as college students or individuals with various psychiatric diagnoses results in poorly defined factors on self-report measures of anxiety and depression. Further, the emergence of a clear SCL-90 anxiety factor is contrary to earlier findings (Gotlib & Cane, 1989). The correlation of .38 between SCL-90 depression and anxiety subscales appears relatively lower than correlations found in many previous studies (Dobson, 1985; Gotlib & Cane, 1989; Watson & Kendall, 1989). In terms of test construction, it appears that, by focusing on characteristic symptoms, it is possible to construct new instruments (and revise existing ones) to most efficiently distinguish between the clinical phenomena of depression and anxiety.

The two depression subscale items ("feeling trapped" and "worrying too much") which cross-loaded on the anxiety factor may reflect symptoms common to both anxiety and depression. In terms of the Tripartite Model, the results of this and other studies seem to suggest that the apparent importance of common versus unique factors may be considerably influenced by instrument and sample variables (Cox et al., 1993; Endler et al., 1992; Riskind et al., 1987). Additional research on how these variables effect the discriminant validity of self-report measures of anxiety and depression appears warranted. Also, replication of the current findings is necessary as our study contains inherent limitations. For one, because the data were collected for other purposes, important variables such as inter-rater reliability of diagnoses cannot be assessed. The extent to which the current results generalize to other diagnostically homogeneous patient samples awaits further investigation.

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