Discriminant and Convergent Validity of the SCL-90 in Psychiatric Inpatients

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Summary: Examined the convergent and discriminant validity of the SCL-90 in a group of 113 psychiatric inpatients and determined the degree of reactivity to several common response sets. The nine SCL-90 dimensions were found to correlate with analogous measures from other tests, and thus showed convergent validity, but were also found to correlate with nonanalogous measures, an indication of low discriminant validity. In addition, the dimensions correlated with the three MMPI validity scales, suggesting their reactivity to response bias. These findings were interpreted as indicating that the SCL-90 has limited use with psychiatric inpatients at present, although it may be useful as a brief screening device for disposition and referral.

The SCL-90 (Derogatis, Lipman, & Covi, 1973) is a new 90 item self-report symptom inventory constructed to measure psychopathology in medical and psychiatric outpatients. The checklist consists of nine primary symptom dimensions, including: somatization (SOM), obsessive-compulsive (O-C), interpersonal sensitivity (INT), depression (DEP), anxiety (ANX), hostility (HOS), phobic anxiety (PHOB), paranoid ideation (PAR) and psychoticism (PSY). Of these the first five symptom dimensions evolved from factor analytic studies (Derogatis, Lipman, Covi, & Rickels, 1971; Derogatis, Lipman, Covi, Rickels, & Uhlenhuth, 1970) and the remaining four were rationally developed (Derogatis, Lipman, & Covi, 1973).

Extensive use of the SCL-90 with psychiatric outpatients has led to the compilation of data on the psychometric properties of the checklist. For example, Derogatis, Rickels, and Rock (1976) have reported that the internal reliability coefficients of the nine dimensions ranged from .77 to .90 in a heterogenous group of 565 psychiatric outpatients. Similarly, Green, Gleser, Stone, and Siefert (1975) found that the internal consistency reliabilities of the five dimensions (SOM, ANX, HOS, O-C and DEP) employed in a therapy outcome study ranged from .77 to .84. Recently, Derogatis et al. (1976) studied the convergent and discriminant validity of the SCL-90 dimensions in a group of 209 symptomatic volunteers for psychotherapeutic drug trials. They found that the nine SCL-90 dimensions showed peak correlations ($r > .40$) with analogous scales from among the MMPI clinical scales, the Wiggins (1966; 1971) content scales of the MMPI and the Tryon (1966) cluster scales of the MMPI, while correlating to a lesser degree ($r < .40$) with nonanalogous scales. The results of the study were interpreted as a demonstration of the high convergent and discriminant validities of the nine SCL-90 dimensions.

A number of studies have shown that the SCL-90 is a sensitive measure of a variety of treatment effects. The checklist appears to be sensitive to the treatment effects of psychotherapeutic drugs (e.g., Lipman, Park, & Rickels, 1966; Raskin, Schulterbrant, Reatig, & McKeon, 1970) and to symptom changes following a preliminary interview (Uhlenhuth & Covi, 1969) and brief psychotherapy (Green et al., 1975).

Since the SCL-90 has been used successfully with outpatient groups and the authors (Derogatis et al., 1973, 1976) report that data are being compiled for inpatients, it seems likely that the checklist will begin to be used with psychiatric inpatients. However, no studies have been published to date concerning the validity of the SCL-90 among psychiatric inpatients and without such basic data the use of the checklist for this population is questionable.

The present study was designed to investigate the convergent and discriminant validity (Campbell & Fiske, 1959) of

the nine dimensions of the SCL-90 in psychiatric inpatients with the goal of evaluating its potential for use in inpatient settings. More specifically, it was hypothesized that the SCL-90 dimensions would show high convergent validity (i.e., peak correlations) for analogous measures administered concurrently and would show high discriminant validity (i.e., nonsignificant correlations) for nonanalogous measures. In addition, relationships between the nine SCL-90 dimensions and the validity scales of the MMPI were examined for the purpose of determining the extent to which the SCL-90 dimensions are affected by various response sets which are common among psychiatric inpatients.

Method

Subjects

The subjects were 113 patients (59 males, 54 females) from several short-term treatment units of a mental hospital. The patients had a mean age of 31.5 years (SD = 11.0), educational levels ranging from 6 to 19 years (M = 11.8; SD = 6.8), and number of admissions ranging from 1 to 7 (M = 1.8; SD = 1.6). Diagnostic categories in the sample included: 53 functional psychoses, 38 neuroses, 13 personality disorders, and 9 situational disturbances. All the patients had been referred for group psychotherapy but were tested prior to receiving therapy and within one week of admission to the hospital.

Measures

Prior to receiving therapy, patients were administered the following battery of tests: (a) the Beck Depression Inventory (BDI; Beck, 1967), a 26-item inventory rated on separate 3-point scales and providing a measure of the severity of depressive symptomatology; (b) the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970), a 40-item inventory providing measures of current situational anxiety (A-State) and general anxiety proneness (A-Trait); (c) the Whitaker Index of Schizophrenic Thinking (WIST; Whitaker, 1973), a 25-item forced choice test for measuring disordered thinking through the weighted scoring of abnormal associations (loose = 1, reference = 2, clang = 3, nonsense = 4) chosen as responses to the stimulus questions; (d) the MMPI, scored for the three validity and the ten clinical scales; and (e) the SCL-90, scored for the nine symptom dimensions listed above.

Means and standard deviations were computed for all measures as were the correlations between the nine symptom dimensions and the other measures.

Results and Discussion

The means and standard deviations obtained by patients on the measures are presented in Table 1 and for comparison purposes the means and standard deviations of the SCL-90 symptom dimensions obtained by Derogatis et al.'s (1976) outpatients are also listed. The table shows that the present sample differed significantly from Derogatis et al.'s (1976) outpatient sample on several SCL-90 dimensions and MMPI scales. The present sample of inpatients reported being significantly more disturbed by the symptoms of paranoid ideation [t (320) = 2.04, $p < .05$] and psychoticism [t (320) = 3.82, $p < .01$] on the SCL-90 while reporting significantly less disturbance from symptoms of hostility [t (320) = 3.90, $p < .01$]. In regard to the MMPI scales, inpatients obtained significantly higher scores on the L scale [t (320) = 6.35, $p < .01$], the F scale [t (320) = 2.11, $p < .05$], the K scale [t (320) = 2.04, $p < .05$], the Pa scale [t (320) = 2.89, $p < .01$], the Sc scale [t (320) = 1.97, $p < .05$], and the Ma scale [t (320) = 2.57, $p < .05$] and obtained significantly lower scores on the D scale [t (320) = 4.36, $p < .01$], and the Pt scale [t (320) = 2.16, $p < .05$], and the Si scale [t (320) = 3.42, $p < .01$]. These results generally reflect the basic differences in the diagnostic compositions of the two samples: the present sample included 53 functional psychotics, while schizophrenics were excluded from the outpatient sample. The correlations between the SCL-90 dimensions and age, education, race and number of admissions were nonsignificant

Table 1

Descriptive Statistics of the Measures Administered

Measure	Present Study		Derogatis et al. (1976)	
	n = 113		n = 209	
	Mean	SD	Mean	SD
SCL-90				
SOM	1.00	.77	.90	.65
O-C	1.39	.93	1.58	.86
INT	1.37	.88	1.49	.85
DEP	1.67	1.01	1.87	.48
ANX	1.42	1.03	1.49	.78
HOS**	.89	.78	1.27	.92
PHOB	.83	.84	.70	.67
PAR*	1.38	.95	1.16	.87
PSY**	1.07	.85	.82	.64
MMPI				
*L***	53.94	9.82	47.33	6.79
*F**	70.52	16.32	66.75	13.00
*K**	49.56	9.56	47.45	7.30
Hs	63.51	14.50	64.95	13.43
*D***	72.23	17.79	80.55	12.99
Hy	65.30	12.58	67.29	10.93
Pd	72.68	13.04	70.71	13.62
Mf	56.09	10.95	56.16	14.77
*Pa***	70.49	14.67	65.91	11.27
*Pt**	71.53	15.79	75.29	12.90
*Sc**	79.15	20.15	74.83	15.73
*Ma**	63.50	13.85	59.56	11.45
*Si***	60.94	11.19	65.70	13.03
BDI	16.61	11.41		
STAI				
A-State	48.72	12.60		
A-Trait	49.17	11.50		
WIST	7.16	7.00		

* $p < .05$. ** $p < .01$.

Table 2

Correlations Between SCL-90 and Other Measures

	Beck	A-State	A-Trait	WIST	MMPI												
					L	*F*	*K*	*Hs*	*D*	*Hy*	*Pd*	*Mf*	*Pa*	*Pt*	*Sc*	*Ma*	*Si*
Somatization	55	46	50	–01	–34	32	–32	58	33	45	36	–24	50	52	48	27	36
Obsessive-Compulsive	66	52	64	–04	–34	34	–39	49	51	42	41	–07	38	60	57	18	43
Interpersonal Sensitivity	58	48	60	–12	–39	27	–44	38	47	27	42	–01	40	56	47	09	60
Depression	70	58	72	–16	–44	14	–38	41	48	42	47	–17	36	52	40	05	42
Anxiety	67	59	69	–10	–41	26	–41	43	35	41	37	–27	50	54	48	23	32
Hostility	46	36	43	–03	–33	13	–43	17	14	12	20	–19	31	25	25	20	15
Phobic Anxiety	52	48	53	03	–30	30	–25	47	36	39	36	–09	41	52	50	10	46
Paranoid Ideation	59	41	53	–09	–31	30	–40	30	31	26	36	–13	48	32	41	18	29
Psychoticism	63	47	56	–02	–34	42	–44	36	33	26	37	–13	48	56	57	27	39

Note: $r(111)$ .18, $p < .05$.
$r(111)$ .24, $p < .01$.
$r(111)$ .31, $p < .001$.

with the exception of the correlation between age and PSY [r (111) = –.21, $p < .05$]. Therefore, it appears that the SCL-90 dimensions were relatively independent of those factors. The correlations between the SCL-90 dimensions and the other measures are presented in Table 2.

As shown in the table, the SCL-90 dimensions reflect substantial convergent validity in that peak correlations ($r \geqslant .40$) were obtained between the symptom dimensions and analogous measures of the constructs from among the other scales. For example, the SOM dimension of the SCL-90 was found to show a peak correlation (r = .58) with the *Hs* scale of the MMPI, the DEP dimension showed peak correlations with the BDI (r = .70) and the MMPI *D* scale (r = .48), the PAR dimension showed a peak correlation with the MMPI *Pa* scale (r = .48), and the ANX dimension showed peak correlations with A-Trait (r = .69), A-State (r = .59) and the *Pt* scale of the MMPI (r = .54). Only one finding shown in the table was contrary to expectations regarding the convergent validity of the SCL-90 – the lack of correlation between the PSY dimension and the WIST, a measure of disordered thinking. However, the correlation of .57 between the PSY dimension and the *Sc* scale of the MMPI shows an expected convergence. Generally, the pattern of correlations shown in the table reflects the high convergent validity of the SCL-90 dimensions for inpatients.

Although the correlations shown in the table demonstrate moderate to high convergent validity for the SCL-90 dimensions, they suggest only a low degree of discriminant validity. Findings indicative of low discriminant validity include: (a) moderate to high correlations (.46 to .72) were obtained between all SCL-90 dimensions and the BDI and A-Trait; (b) moderate correlations (.36 to .59) were found between A-State and the SCL-90 dimensions; and (c) each of the SCL-90 dimensions correlated to a significant degree with each of the MMPI clinical scales with the exception of the *Mf* and *Ma* scales. However, the SCL-90 dimensions did reflect high discriminant validity with respect to measured thought disorder, since the SCL-90 dimensions showed no significant relationships with the WIST. In summary, the SCL-90 symptom dimensions were found to show relatively little discriminant validity in the present inpatient sample, since the dimensions were found to correlate to a significant degree with practically all the other measures included in the study.

The pattern of correlations shown in Table 2 suggests one possible explanation for the low discriminant validity of the SCL-90 dimensions. The high correlations obtained between the SCL-90 dimensions and the BDI, A-State, A-Trait, and the *Pt* scale of the MMPI suggest that the dimensions share a strong common component composed of two symptom constructs – anxiety and depression. Therefore, to the extent that the other measures contain components of anxiety and depression significant correlations would result. Further evidence of the common components in the nine SCL-90 symptom dimensions is shown in Table 3 which shows the intercorrelations of the nine dimensions. The table shows that the intercorrelations among the dimensions ranged from .45 to .80 with a median of approximately .67, an indication that the dimensions are not independent but share a substantial proportion of variance. This finding is similar to that obtained by Green et al. (1975) who found that the five dimensions which they used with outpatients all loaded on a single factor.

The final issue in evaluating the potential of the SCL-90 for use with psychiatric inpatients was the extent to which various response sets might be expected to affect scores on the dimensions. In this respect, Table 2 shows that the SCL-90 dimensions were found to correlate significantly and consistently with the *L* and *K* scales of the MMPI. This finding indicates that dissimulating and defensive inpatients tended to obtain lower scores on the nine dimensions of the SCL-90. Conversely, inpatients with a "fake bad" response set, as measured by the MMPI *F* scale, tended to obtain higher scores on a number of the SCL-90 dimensions. As shown in the table, all the dimensions except DEP and HOS correlated signifi-

Table 3

Intercorrelations of the SCL-90 Symptom Dimensions

	O-C	INT	DEP	ANX	HOS	PHOB	PAR	PSY
SOM	.72	.66	.68	.78	.63	.64	.60	.68
O-C	–	.74	.78	.79	.65	.63	.66	.72
INT		–	.75	.72	.63	.71	.71	.75
DEP			–	.80	.65	.61	.61	.64
ANX				–	.67	.69	.66	.71
HOS					–	.45	.55	.61
PHOB						–	.66	.62
PAR							–	.73

Note: All *r*s significant at $p < .0001$.

cantly with the *F* scale. Taken together, these results indicate that the SCL-90 dimensions are moderately reactive to various response sets which are common among psychiatric inpatients and suggest that scores on the dimensions should be interpreted with caution in an inpatient population.

In conclusion, the results of the present study indicate that the SCL-90 has limited usefulness at present with psychiatric inpatients. Although the nine symptom dimensions of the checklist possess an adequate degree of convergent validity for established measures of psychopathology, they show relatively low discriminant validity and are reactive to the effects of various response sets, especially dissimulation. However, the brevity of the checklist and the adequate convergent validity of the dimensions suggest that the checklist might be useful at present as a screening device for the purpose of disposition and referral.

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