
Chapter 10

SCL-90-R, Brief Symptom Inventory, and Matching Clinical Rating Scales

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The SCL-90-R (Derogatis, 1977, 1983) is a 90-item self-report symptom inventory that evolved most immediately from the Hopkins Symptom Checklist (HSCL) (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974a, 1974b). The HSCL has roots in both the Discomfort Scale (Parloff, Kelman, & Frank 1954) and the Cornell Medical Index (Weider et al., 1948). Certain items shared by these scales can be traced back to the first self-report symptom inventory (the Woodworth Personal Data Sheet; Woodworth, 1918).

A prototype version of the SCL-90-R was first described in 1973 (Derogatis, Lipman, & Covi, 1973), and the final version of the instrument was completed 2 years later (Derogatis, 1975). The inventory measures psychological distress in terms of nine primary symptom dimensions and three global indices of distress. The dimensions represent the constructs of somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Three global measures, the Global Severity Index (GSI), the Positive Symptom Distress Index (PSDI), and the Positive Symptom Total (PST), complete the complement of measures. These indices were developed to reflect distinct but related aspects of overall psychological distress—an aim that has been confirmed empirically (Derogatis, Yevzeroff, & Wittelsberger, 1975; Wood, 1986).

The SCL-90-R, as are all the instruments in the series, was developed to be utilized with an extensive range of respondents. The inventory may be validly employed with community respondents, students, medical patients, and various types of psychiatric outpatients and inpatients. Currently, the SCL-90-R is available in English, French, Spanish, German, Russian, and 20 other languages. Microcomputer scoring, administration, and interpretation programs are also available for the SCL-90-R.

The Brief Symptom Inventory (BSI; Derogatis, 1992; Derogatis & Melisaratos, 1983; Derogatis & Spencer, 1982) is composed of 53 items and represents the brief form of the SCL-90-R. It was also completed in 1975, and reflects psychological distress in terms of the same nine symptom dimensions and three global indices as the longer test. The BSI was designed specifically for those measurement situations in which the measurement time frame will not allow at least 15 minutes, the time typically required to complete the SCL-90-R. Because scores on the SCL-90-R and the BSI are highly correlated, however, the brief

version of the test is sometimes preferred even when there are no time constraints. As with the SCL-90-R, the three global indices, nine principal symptom dimensions, and individual items represent the three fundamental levels of clinical interpretation of the test.

Although the SCL-90-R represents a significant psychological test instrument, it also serves as the centerpiece of a series of matched, cross-modality tests. The primary advantage of such an approach is that it enables assessment of clinical status via both self-report and expert clinical judgment. Toward that end, several companion clinical rating scales to the SCL-90-R have also been developed.

The Hopkins Psychiatric Rating Scale (HPRS) is a multidimensional clinical rating scale designed to be the clinician's version of the SCL-90-R. The first nine dimensions of the HPRS match the nine symptom constructs of the SCL-90-R. Eight additional dimensions, judged integral to valid clinical interpretation but not amenable to reliable self-report, also comprise the scale. A brief form of the HPRS (the Brief Hopkins Psychiatric Rating Scale [BHPRS]) is also available; it consists of only the nine matching SCL-90-R symptom constructs. The HPRS and BHPRS are designed to be used by experienced clinicians trained in psychiatric nosology and psychopathology.

The SCL-90 Analogue Scale (SCL-90-A) is a second companion scale to the SCL-90-R. It is designed for health professionals (e.g., physicians, nurses, social workers, interviewers) who have not received specific training in psychopathology and psychiatric nosology. It is a graphic or analogue scale that represents the nine primary symptom dimensions of the SCL-90-R along 100 millimeter lines, extending from "not-at-all" at the minimum distress point to "extremely" at the maximum. Any of the three companion clinical observer's scales may be used in conjunction with either the SCL-90-R or the BSI.

Normative Samples

There are currently four formal norms for the SCL-90-R: (a) psychiatric outpatients, (b) community nonpatients, (c) psychiatric inpatients, and (d) adolescent nonpatients (Derogatis, 1983). All norms for the SCL-90-R are gender keyed. This means that separate norms exist for males and females for both dimension and global scores, an important normative refinement when attributes involving emotional expression or psychological distress are assessed. Further, there are informal norms and additional normative information on a number of other samples.

The psychiatric outpatient norm (norm A) is based on 1,002 heterogeneous outpatients who presented for treatment at the outpatient psychiatry departments of four major teaching hospitals in the East and the Midwest. The sample was composed of 425 males and 577 females, was approximately two-thirds White, and slightly more than 63% of the sample arose from social class categories IV and V. Detailed demography of this and all other formal norms may be found in the Administration, Scoring and Procedures Manual for the SCL-90-R (Derogatis, 1977, 1983).

The community nonpatient norm (norm B) was established on a cohort of 973 individuals who represent a stratified random sample from a diversely populated county in a major eastern state. Demography is not as complete on this sample as is the case with others. Gender was evenly split: 50.7% of the sample was male and 49.3% was female. The racial composition of the sample was predominantly White (84.6%), with 11.6% Black. Other racial groups comprised 1.6% of the sample. A slight majority of the sample were married, and the mean age of the group was 46 years.

The psychiatric inpatient norm (norm C) has its basis in 423 individuals who were a heterogeneous group of patients from the psychiatric inpatient services of three major eastern hospitals. Almost two thirds of the sample were female, with 55.7% being White and 43.6% being Black. About 45% were single, with 26.1% married. Almost 80% of these patients arose from social class categories IV and V, and their mean age was 33.1 years.

The adolescent nonpatient norm (norm E) is based on 806 adolescents who were enrolled in two distinct midwestern schools. Females comprised approximately 60% of the sample, which was almost exclusively White. Social class position was predominantly middle class, with relatively small representations from adjacent working (class IV) and upper middle (Class II) groups. Age ranged from 13 to 18, and was normally distributed around the mean age of 15.6 years.

RELIABILITY AND VALIDITY

Reliability. Reliability essentially pertains to the consistency or replicability with which an instrument measures the characteristic(s) under observation. It is the converse of measurement error, and represents the proportion of variation in any measurement that is due to systematic variation of the attribute under study (e.g., intelligence, depression, impulsivity) as opposed to variance due to random or systematic error. Two formal types of reliability estimates are available for the symptom dimensions of the SCL-90-R: (a) internal consistency and (b) test-retest. The former serves to reflect the homogeneity of the item sets developed to represent each symptom construct; test-retest reliability is much more of a measure of temporal stability, or score consistency across time.

Internal consistency coefficients for the nine dimensions were calculated from the data of 209 symptomatic volunteers (Derogatis, Rickels, & Rock, 1976) in the form of coefficients alpha (α). Coefficient alpha treats within-form correlations among the items as analogous to correlations between alternate forms, and makes the assumption that the average correlation among actual items is equivalent to the correlation among items in the hypothetical alternate form (Nunnally, 1970). Coefficients in this assessment were quite satisfactory, ranging from a low of .77 for psychoticism to a high of .90 for depression. Internal consistency coefficients for the SCL-90-R were also developed more recently by Horowitz, Rosenberg, Baer, Ureno, and Villasenor (1988) based on 103 outpatients presenting for psychotherapy. Coefficients alpha in that study ranged from a low of .84 for interpersonal sensitivity to a high of .90 for depression (see Table 10.1).

The test-retest coefficients presented in Table 10.1 arose from a sample of 94 heterogeneous psychiatric outpatients who presented for evaluation and treatment at the psychiatric outpatient department of a major eastern teaching hospital. One week elapsed between testings, and, as is clear from the sizes of the coefficients, the SCL-90-R possesses highly acceptable test-retest reliability. Coefficients ranged from a low of .78 on hostility to a high of .90 on the phobic anxiety dimension. All other stability coefficients fell in the mid-80s. In addition to these estimates of temporal stability, Horowitz et al. (1988) also evaluated the test-retest reliability of the SCL-90-R in their sample of 103 psychiatric outpatients. Even across 10 weeks, coefficients were very acceptable, with the coefficient for the GSI reported as .84, and subscale coefficients ranging from a low of .70 for obsessive-compulsive to a high of .83 for paranoid ideation.

Factorial Invariance. Factorial invariance is an important characteristic of multidimensional measurement, although many professionals are unfamiliar with the concept. In

TABLE 10.1
Internal Consistency and Test-Retest Reliability Coefficients for the SCL-90-R

Symptom Dimension	Internal Consistency (Coefficient α)	Test-Retest (r_{tt})			
	Derogatis (1976) ^a	Horowitz et al. (1988) ^b	Derogatis (1983) ^c	Horowitz et al. (1988) ^b	
I. SOM	.86	.88	.86	.68	
II. O-C	.86	.87	.85	.70	
III. INT	.86	.84	.83	.81	
IV. DEP	.90	.90	.82	.75	
V. ANX	.85	.88	.80	.80	
VI. HOS	.84	.85	.78	.73	
VII. PHOB	.82	.89	.90	.77	
VIII. PAR	.80	.79	.86	.83	
IX. PSY	.77	.80	.84	.77	
X. GSI	—	—	—	.84	

^aN = 219 symptomatic volunteers

^bN = 103 psychiatric outpatients.

^cN = 94 heterogeneous psychiatric outpatients with 1 week elapsed between tests.

simplest terms, factorial invariance refers to the degree of dimensional constancy a factorial definition maintains during the alteration of salient respondent parameters (e.g., age, gender, race, social class). For example, if a factorially derived depression dimension is developed from a middle-aged sample, will that same set of items stay together to provide a valid measure of depression among the elderly? Will the dimensional composition retain its invariance when moving from male to female samples? If the factorial compositions of the dimensions of the test change significantly (i.e., are unreliable) across fundamental parameters, the operational definition of the construct has limited validity and generalizability.

Invariance data have been reported for few psychological tests, in large measure because such studies are rather demanding, and there is no a priori hierarchy of which parameters to investigate. There is invariance data on the SCL-90-R, however. Factorial invariance coefficients (Pinneau & Newhouse, 1964) were developed by Derogatis and Cleary (1977) contrasting male and female samples on the nine dimensions of the SCL-90-R. All dimensions revealed acceptable levels of invariance between males and females, with the exception of paranoid ideation, which showed only moderate constancy.

VALIDITY

Two principal issues that should be appreciated about the validation of psychological test instruments in general concern: (a) the specificity of validity and (b) the programmatic nature of the validation process. The former issue refers to the fact that, in order for the question "Is this test valid?" to have scientific meaning, the conditional statement "For what purpose?" must be appended. Psychological tests are not valid measures in general, but, like all other scientific measuring instruments, are valid for certain specific purposes and generally invalid for most others.

The second issue focuses on the fact that, in recent years, psychometric theorists have increasingly stressed construct validity as the principal criterion for the validation of psycho-

logical tests and the assignment of meaning to them (Messick, 1975, 1981). The validation process involves an extensive program of experiments and analyses that are highly analogous to the steps necessary to prove a scientific theory. Data from predictive, content, convergent, discriminant, and other types of validation studies serve to contribute to the ultimate validation of the hypothetical construct(s) that the test serves to operationalize. The process of establishing the validity of a test is represented by a methodical series of studies that function to extend and redefine the limits of generalizability of the test as a definition of the construct.

Convergent-discriminant validation is a fundamental form of validity that essentially demonstrates that the measure of interest correlates substantially with separate measures of the same construct, and shows little or no correlation with measures of dissimilar constructs. Derogatis et al. (1976) illustrated excellent convergent-discriminant validity for the SCL-90-R in a study contrasting its dimensions with those of the Minnesota Multiphasic Personality Inventory (MMPI). In addition to the standard MMPI clinical scales, the MMPI was also scored for the Wiggins (1969) content scales, and Tryon's (1966) cluster scales. Results illustrated that SCL-90-R dimensions had their highest correlations with like MMPI constructs in every case except obsessive-compulsive, which has no directly comparable MMPI scale. Boleloucky and Horvath (1974) reported a comparable study comparing SCL-90-R dimensions to the dimensions of the Middlesex Hospital Questionnaire (MHQ). With the large majority of dimensions, there was good convergence between like scales and good discrimination as well. Details of both of these studies are presented in greater detail in various editions of the *Administration, Scoring and Procedures Manual* for the SCL-90-R (Derogatis, 1977, 1983).

In a validation study more directly related to the construct validity of the instrument, Derogatis and Cleary (1977) cast the hypothesized dimensional structure of the SCL-90-R into a binary hypothesis matrix (i.e., each item was assigned 1 for the factor it loaded on and 0 for all others). Subsequently, data from the SCL-90-Rs of 1,002 psychiatric outpatients were factor analyzed and the solution was rotated toward the target matrix via the Procrustes method (Hurley & Cattell, 1962). Rotations were also accomplished via normalized varimax procedures (Kaiser, 1958). Comparisons of both solutions matched the hypothesized dimensional structure of the SCL-90-R cleanly, with only the psychoticism dimension showing some scatter.

A very interesting series of validation experiments, reflecting elements of concurrent, predictive, and construct validity for the SCL-90-R, were recently reported by Peveler and Fairburn (1990). They compared and correlated scores from the SCL-90-R with those from the Present State Examination (PSE; Wing, Cooper, & Sartorius, 1974), a clinician-administered structured interview. Two distinct samples were utilized in the study: a sample of diabetics ($n = 102$), representing a chronic medical disease group; and a cohort of bulimics ($n = 71$), exemplifying patients with high levels of neurotic symptoms. Three distinct validation experiments comprised the study. In the first investigation, the case-finding power of the SCL-90-R was evaluated via Receiver Operating Characteristic Analysis (ROC) and logistic regression analysis. In this experiment, the proficiency of the SCL-90-R to detect PSE-defined psychiatric caseness was evaluated. The instrument performed efficiently in each instance, with areas under the curve (AUC) of .90 + .03 in both cases. In the diabetic sample, the optimum sensitivity was 88% with a specificity of 80%, whereas with the bulimic sample, sensitivity was 76% with a specificity of 92%. Logistic regression analysis relating the GSI from the SCL-90-R to the probability of being a PSE-defined case also characterized the instrument favorably. Sensitivity among diabetics was 72%, whereas specificity was 87%; among bulimics, values were 77% and 91%, respectively.

These investigators also evaluated the validity of the global indices of the SCL-90-R as

accurate measures of general severity of psychopathology by correlating them with global indices from the PSE. Across both samples, all coefficients were statistically significant, and ranged from approximately .60 to .82. In addition, the validities of the SCL-90-R subscales were tested by evaluating their capacities to predict the presence of PSE syndromes through discriminant function analysis. Appropriate subscales were revealed in 12 of 14 instances in the diabetic sample, and 11 of 14 cases in the bulimic cohort. A further concurrent validation exercise was conducted with the depression subscale of the SCL-90-R by correlating it with two unidimensional depression instruments, the BDI and the Asberg Rating Scale. Correlations were .80 and .81, respectively.

As noted previously, the type of validation of most interest to clinicians and researchers is the more tangible and pragmatic form (i.e., predictive validity). Derogatis (1990) recently published *SCL-90-R: A Bibliography of Research Reports, 1975-1990*, which listed approximately 500 published research reports using the SCL-90-R. An addendum for 1991 lists an additional 125 published studies. This large collection of research demonstrated, in a rather compelling fashion, the breadth of the SCL-90-R's sensitivity. Therapeutic intervention studies evaluating treatments as diverse as meditation (Carrington et al., 1980), multicenter psychotherapy protocols (Shapiro & Firth, 1987), and numerous psychotropic drug trials (Ballenger et al., 1988; Noyes et al., 1984) attest to the instrument's sensitivity to treatment-induced change. Characteristic SCL-90-R profiles for most major diagnostic groups have been established, including those for anxiety (Cameron, Thyer, Nesse, & Curtis, 1986), depression (Prusoff, Weissman, Klerman & Rounsaville, 1980), panic disorder (Buller, Maier, & Benkert, 1986), and sexual dysfunctions (Derogatis, Meyer, & King, 1981). Such profiles have also been developed for recently delineated compound nosologic subtypes; for example, comorbid panic/depression (Wetzler, Kahn, Cahn, vanPraag, & Asnis, 1990) and substance abuse (Steer, Platt, Ranieri & Metzger, 1989). In addition to many studies of this nature, the SCL-90-R has been utilized as a distress measure with most major medical illness groups (e.g., neoplastic, cardiovascular, and renal diseases) and specialized disorder groups (e.g., eating disorders, stress, pain). Although this chapter is not an appropriate forum for a comprehensive review of predictive validity studies, the reports are readily available for readers who wish to evaluate them.

Interpretation of the SCL-90-R

The SCL-90-R was designed to be interpreted in terms of three distinct, but related levels of information: global scores, dimension scores, and item scores. The optimal interpretation of the test protocol depends on integration of information from all three sources. A significant advantage associated with the SCL-90-R, and one that more clinical scales are adopting, concerns the fact that test scores are standardized and reported in terms of area *T* scores. Compared with linear *T* scores, area scores possess enormous advantages in that they involve a normalizing area transformation of the raw score distribution. This translates into being able to make actuarial statements concerning the respondent's status relative to the norm, and having the capacity to precisely place him or her in an accurate percentile position. As an example, regardless of the particular symptom dimension, an area *T* score of 60 always will place that respondent in the 84th percentile of the referent norm. Similarly, an area *T* score of 70 will place the individual in the 98th percentile. This feature enables the clinician to not only make accurate comparisons between his patient's status and various norms of interest, but also enables meaningful comparisons within individual profiles (e.g., comparison of

Depression versus Anxiety scores). When linear T scores are used, such comparisons can only be meaningfully made if the underlying raw score distribution is perfectly normal.

GLOBAL SCORES

The GSI represents the most sensitive single quantitative indicator concerning the respondent's psychological distress status. It reflects information on both the number of distress manifestations the individual is experiencing and the intensity level of his or her distress. The PSDI is considered to be a pure intensity measure, adjusted for numbers of symptoms. In addition, the PSDI can provide useful information as to the respondent's distress style, that is, whether one is apt to be an augmentor, typically exaggerating distress, or a minimizer, typically utilizing understatement. The PST reveals the number of symptoms the respondent has endorsed to any degree. It contributes to interpretation by conveying the breadth or array of symptoms that the individual is currently experiencing. Although there are no formal validity scales on the SCL-90-R, the PST can also provide a coarse indication of whether the respondent is attempting to consciously misrepresent his or her status. Concerning symptom suppression, PST scores of 3 or less for adult normal females and 2 or less for adult normal males are extremely uncommon, and should be viewed with some misgivings. On the question of augmentation, PST scores greater than 70 for females and greater than 65 for males are rarely seen as valid scores outside of psychiatric inpatient populations. Although crude indicators, these values may be useful in identifying individuals in the community population with extreme response styles.

DIMENSION SCORES AND THE SCL-90-R PROFILE

A major advantage associated with the use of the SCL-90-R resides in the fact that, despite its relative brevity, it delivers a multidimensional symptom profile. Multidimensional measurement significantly enhances the breadth of clinical assessment compared with unidimensional measurement by providing a syndromal context within which specific dimensional distress data may be evaluated more meaningfully. It delivers a distress background against which to evaluate scores on any particular symptom dimension. In conjunction with global scores and data on specific symptoms, it enhances the development of an integrated picture of the respondent's clinical status and level of well-being.

INDIVIDUAL SYMPTOMS

The third interpretive element in the strategy behind clinical evaluation with the SCL-90-R involves the use of the discrete items or symptoms of the test. Not only are we referring here to the 83 items comprising the nine primary symptom dimensions, but also the 7 additional or configural items of the test. For example, an elevated Depression score plus a substantial score on suicidal ideation (item 15) should be interpreted differently than the same Depression score in the absence of evidence of suicidal ideation. In such an instance, suicidal ideation would be treated as a symptom of note, the presence of which would clearly alter the clinical decision process. As another example, clinical levels of depression combined with early morning awakening (Item 64), loss of interest (item 32), and high levels of guilt (item 89) may signal the emergence of a major affective disorder. The same Depression score with

a different pattern of accompanying symptoms could be interpreted quite differently. The configural items are not pure or univocal symptoms of any specific dimensional construct; they are designed to enhance specific predictions concerning the respondent's clinical status. They represent clinically significant symptom manifestations, which are not unique to any of the SCL-90-R's primary symptom dimensions. Sleep and appetite problems, as examples, are important general clinical manifestations. They do not occur solely in the context of a particular syndrome, but their presence in a particular case can be a significant aid in clinical decision making.

Caseness Criteria for the SCL-90-R

When the SCL-90-R or any other psychological inventory or rating scale is utilized in a screening paradigm, an operational definition of *caseness* must be established. The caseness criterion essentially refers to the numerical value on some test indicator, at or above which the respondent is considered to be a positive or a case. The caseness criterion is a probabilistic value, chosen to maximize valid case identification (e.g., sensitivity and specificity) and minimize errors (i.e., false positives and false negatives). In psychiatric screening, it is difficult to develop a definitive criterion value for caseness for a particular test, because other important parameters (e.g., gender, age, the population being screened) have significant effects on the validity of any criterion value. Nevertheless, it is possible to establish a general criterion for caseness that has demonstrated generalizability across a range of parameter values, and will prove useful in practical screening situations.

Such a criterion is given later for the SCL-90-R. Although it is not possible in the context of this monograph to provide all the data supporting the general caseness criterion given here, we can provide some information. This criterion has been very effective in accurately discriminating individuals comprising the community nonpatient normative cohort from those comprising the psychiatric outpatient sample. Further, in a multicenter epidemiologic study of the prevalence of psychiatric disorder in newly admitted cancer patients, the same criterion developed hit rates of 85%–87% (Derogatis et al., 1983). According to this definition, a *case* is defined by:

$$\text{Positive } D_x = T_{\text{gsi}} > T_{63} \text{ or } T_{2\text{DIM}} > T_{63}$$

This operational definition states; if the respondent has a GSI score (using norm B, the community nonpatient norm) greater than or equal to a *T* score of 63, or any two primary dimensions scores are greater than or equal to a *T* score of 63, the individual shall be considered at high risk for a positive diagnosis and, therefore, a case.

Summary of BSI Development

The Brief Symptom Inventory (BSI) is the brief form of the SCL-90-R. It is a 53-item self-report symptom inventory designed to assess the psychological symptom patterns of psychiatric and medical patients as well as community nonpatient respondents. The BSI was designed to provide quality, multidimensional measurement of psychological distress in a brief (10-minute) evaluative period. The instrument's 53 items were selected to best reflect the nine primary symptom dimensions of the SCL-90-R in a brief measurement scale. As is

true of the nine primary symptom dimensions, the BSI also shares the three global indices of distress associated with the SCL-90-R: the General Severity Index (GSI), the Positive Symptom Distress Index (PSDI), and the Positive Symptom Total (PST). As with the SCL-90-R, the global indices were designed to provide more flexibility in overall assessment of psychopathologic status, as well as psychometric appraisal at a third, more general level of psychological well-being.

Like the SCL-90-R, the BSI is scored and profiled in terms of its nine primary symptom dimensions and three global indices of distress. The three global indicators, nine dimensions, and 53 items reflect the three principal levels of interpretation of the BSI, descending from general, global measures of psychological status, through dimensional syndromes, to individual symptoms.

BSI NORMS

At present, four major norms have been developed for the BSI. These norms were derived from four distinct normative samples: (a) 974 community nonpatient normal subjects, (b) 1,002 heterogeneous psychiatric outpatients, (c) 423 psychiatric inpatients, and (d) 2,408 adolescent nonpatient normal subjects. In addition, Hale, Cochran, and Hedgpeeth (1984) independently published norms for the elderly on the BSI, and Cochran and Hale (1985) reported norms for college students.

The community nonpatient normal sample essentially is identical to the sample upon which norms for the SCL-90-R were developed and that forms the basis for the B norm on the BSI. There were 494 males and 480 females comprising the sample, and, although data on race, marital status, and age were recorded, detailed demography on other variables was not available.

More complete information was available for our sample of psychiatric outpatients. There were 425 males and 577 females in this cohort, which was approximately two-thirds White. Social class was skewed toward the lower end of the socioeconomic scale among the outpatients, with about 35% of the sample from Hollingshead class III or above. This sample forms the basis for the A norm of the BSI.

Although smaller than the other samples, our psychiatric inpatient cohort also has detailed demographic information available. Females outnumbered males approximately 2:1, and slightly more Whites than Blacks were involved. Approximately 45% of the inpatients were never married, whereas only 20% of them were from social class III or above. This group is the basis for the C norm of the BSI.

The fourth normative group related to BSI norms is the adolescent nonpatient norm. Males are represented approximately 2:1 in this cohort, which was derived from six separate schools in two states. This sample is racially composed of 58% Whites, 30% Blacks, and 12% other. Social class is modally distributed in the working-class group. However, there is good representation in the other socioeconomic groups as well. Age in the cohort ranged from 13 to 19, with a mean of 15.8 years. This sample formed the basis for the E norm.

BSI RELIABILITY AND VALIDITY

Internal consistency reliability coefficients were established based on a sample of 719 psychiatric outpatients, using Cronbach's coefficient alpha. The alpha coefficients for all nine dimensions of the BSI ranged from a low of .71 on the psychoticism dimension to a high of

.85 on depression. Other investigators independently reported internal consistency coefficients in a comparable range for the BSI (Aroian & Patsdaugher, 1989; Croog, et al., 1986).

Test-retest reliability is an indicator of the consistency of measurement across time. Once established, psychological distress or psychopathology tends to endure for moderate to substantial periods of time if untreated. Therefore, a test designed to measure symptomatic distress should register high test-retest coefficients over a span of 2 weeks. A sample of 60 nonpatient individuals were tested across a 2-week interval. Coefficients range from a low of .68 for somatization to a high of .91 for phobic anxiety. The Global Severity Index also reveals an excellent stability coefficient of .90, giving strong evidence that the BSI represents consistent measurement across time.

Internal consistency and test-retest reliability coefficients for the nine primary symptom dimensions and three global indices of the BSI are represented in Table 10.2.

Another form of reliability that frequently is discussed concerning psychological tests is alternate forms reliability. This form of reliability is illustrated in correlation coefficients between score distributions from two different forms of a test. Although we do not have a pure alternate form of the BSI, the SCL-90-R represents a test that measures identical symptom constructs. Based on a sample of 565 psychiatric outpatients, the correlations between the two tests across the nine primary symptom dimensions they share were calculated and are represented in Table 10.3. The data demonstrate very high correlations between the BSI and the SCL-90-R on all nine symptom dimensions. At least for a psychiatric population, the two tests show high agreement across the nine symptom constructs.

A comprehensive review of predictive validity studies involving the BSI was provided recently by Derogatis (1992). Approximately 120 research reports on the BSI are reviewed in this monograph, covering areas such as screening/case-finding, oncology, psychoneuroimmunology, psychopathology, pain assessment/management, therapeutic interventions, HIV research, hypertension research, student mental health, and various general clinical areas.

TABLE 10.2
Internal Consistency and Test-Retest Reliability Coefficients for the Nine Primary Symptom Dimensions and Three Global Indices of the BSI

<i>Dimension</i>		<i>Number of Items</i>	<i>Internal Consistency (α) (N = 719)</i>	<i>Test-Retest (r_{tt}) (N = 60)</i>
<i>Primary Symptom Dimensions</i>				
I.	Somatization (SOM)	7	.80	.68
II.	Obsessive-Compulsive (O-C)	6	.83	.85
III.	Interpersonal Sensitivity (I-S)	4	.74	.85
IV.	Depression (DEP)	6	.85	.84
V.	Anxiety (ANX)	6	.81	.79
VI.	Hostility (HOS)	5	.78	.81
VII.	Phobic Anxiety (PHOB)	5	.77	.91
VIII.	Paranoid Ideation (PAR)	5	.77	.79
IX.	Psychoticism (PSY)	5	.71	.78
<i>Global Indices</i>				
Global Severity Index (GSI)		—	—	.90
Positive Symptom Distress Index (PSDI)		—	—	.87
Positive Symptom Total (PST)		—	—	.80

TABLE 10.3
Correlations Between Symptom Dimensions of the SCL-90-R and the BSI
Based on 565 Psychiatric Outpatients

<i>SOM</i>	<i>O-C</i>	<i>INT</i>	<i>DEP</i>	<i>ANX</i>	<i>HOS</i>	<i>PHOB</i>	<i>PAR</i>	<i>PSY</i>
.96	.96	.94	.95	.95	.99	.97	.98	.92

These studies collectively demonstrate the instrument to be broadly sensitive to the manifestations of psychological distress and interventions designed to ameliorate it across a broad range of contexts. To illustrate the BSI's sensitivity to psychological distress status, several of the more exemplary of these studies are reviewed briefly.

Evidence for the BSI's sensitivity in a screening paradigm is given by a recent report that contrasted several methods for the psychosocial screening of newly diagnosed cancer patients (Zabora, Smith-Wilson, Fetting, & Enterline, 1990). These investigators reported an 84% hit rate for the BSI in identifying patients who were determined by separate criteria to be clinically distressed, both at time of initial diagnosis and subsequently at 1-year follow-up. Additionally, a comparative cost-benefits analysis done by the authors resulted in a strong recommendation for the BSI.

Gift (1991) also reported recently on the sensitivity of BSI subscales to differential respiratory status in a sample of adult asthmatics. To determine the underlying causes of episodes of dyspnea (difficulty breathing) in these patients, she utilized the BSI and measured airway obstruction and oxygen saturation during periods of high and low dyspnea. Significant elevations were noted on anxiety, depression, somatization, and hostility subscales during periods of high dyspnea.

Thompson, Gallagher, and Breckenridge (1987) demonstrated high sensitivity for the BSI in an interesting study on treatment-induced change. These investigators compared the relative efficacy of three distinct psychotherapies in applications with depressed elderly patients. Although no substantial differences were observed between treatments, the BSI showed significant reductions in psychological distress for all three interventions across time—a finding that supported an alternate hypothesis.

Finally, in a fascinating study recently reported by Chiles, Benjamin, and Cahn (1990), the BSI was utilized with a random sample of 802 members of the Washington State Bar Association to contrast the psychological distress levels of smokers versus nonsmokers. Results showed that, among male members of the Bar, almost all BSI subtests revealed smokers to be significantly more highly distressed than nonsmokers. Somatization, anxiety, and depression made the greatest contribution to discrimination, with the highly distressed group also showing significantly greater alcohol use. No comparable differences were observed for females.

BSI INTERPRETIVE STRATEGY

Strategies for interpreting the BSI are, for the most part, identical to those outlined earlier for the SCL-90-R. BSI test scores are standardized in terms of area *T* scores, and formal gender-keyed norms are available for the same four normative groups. Caseness criteria are also identical for the BSI, and clinical interpretation is based on integration of information from the same three levels of data, although some minor differences exist.

The SCL-90-R and the BSI in Treatment Planning

For a psychological test instrument to be useful in treatment planning, it must be sensitive (e.g., possess predictive validity) to three distinct, but related, aspects of patient status: (a) patient status at initial evaluation, (b) treatment-induced change, and (c) patient status posttreatment.

Obviously, before an effective treatment plan can be developed, a clinician must know as much as possible about the nature and magnitude of the patient's presenting condition. Diagnostic interviews, medical records, psychological testing, and interviews with relatives all represent sources of information that facilitate the development of an effective treatment plan. Rarely is information from a single modality (e.g., psychological testing) definitive. Ideally, each source provides an increment of unique information, which, taken collectively with data from other sources, contributes to an ultimate understanding of the case at hand.

Although seldom conclusive, a substantial array of pertinent information can be developed from an initial psychological assessment. At a minimum, the degree or magnitude of a patient's psychological morbidity or distress should be discernible. Although diagnosis *per se* is usually not possible from point-in-time assessments, the basic nature (i.e., depression, panic attacks) and profile of the client's distress should be appreciable, as well as salient symptom characteristics (e.g., suicidal ideation, early morning insomnia). Degree of divergence from normative levels and the potential for effective intervention (i.e., prognosis) are also characteristics that ideally would be estimable at initial evaluation.

Initial assessment of patient status should communicate the magnitude, nature, and pervasiveness of a patient's presenting condition and some estimate of the likelihood of successful therapeutic intervention. Although only an ideal, information on the relative probabilities of success associated with different therapeutic approaches also would be very useful.

Treatment-induced change has both common (to all therapeutic modalities) and specific components. When used for treatment planning, psychological test instruments should be sensitive to both categories of effects. Also, depending on the nature, pervasiveness, and chronicity of the condition, and the coping resources available to the patient, the degree of benefit anticipated from a course of effective treatment can vary widely. The ideal planning instrument should be capable of not only registering the influence of such factors, but should be sensitive across their effective range of values.

Patient status at the termination of treatment represents a critical assessment. It reflects the basic evidence of the delivery of treatment and its relative efficacy, at least in terms of the indicators being measured. Meaningful decisionmaking concerning clinical status at treatment termination requires not only adequate community norms for a test, but ideally change norms that would define what constitutes a therapeutic magnitude of change. Such norms would communicate how much change is considered clinically meaningful, given the patient's baseline status, and the associated probability for such a magnitude of response. Also, a realistic concept of effective treatment must be operationally grounded in multiple domains of experience (e.g., enhanced vocational performance, reduction of symptomatic distress, improved family relations). Currently, few test instruments adequately reflect all relevant domains, reminding us that most tests address only limited aspects of efficacy.

Bearing these caveats in mind, the next section of this monograph is devoted to reviewing a series of recent reports demonstrating the treatment planning relevance of psychological distress data as measured by the SCL-90-R/BSI. An extremely diverse range of patients is represented in these studies, illustrating the general utility of these brief tests across a broad

array of patient types. Consistent with the interpretive strategy outlined previously, clinical information from all three levels of assessment (i.e., global score, dimension score, and item score) has been utilized in contributing to treatment planning. Information on overall severity, pattern of distress/psychopathology, and the specific symptom picture may all be employed in the development of a treatment strategy.

For obvious reasons, treatment planning focused on psychotherapeutic interventions with psychiatric patients is of major interest to modern health-care systems. Crits-Christoph (1992) recently completed a meta-analysis of 11 contemporary studies evaluating the efficacy of brief dynamic psychotherapy. The instrument chosen to register the "general level of psychiatric symptoms" in the meta-analysis was the SCL-90-R. Using Cohen's (1977) *d* statistic, the SCL-90-R revealed large treatment effects for brief dynamic psychotherapy when compared with waiting list control ($d = .82$), small effects ($d = .20$) when contrasted with alternative nonpsychiatric treatments, and equal effects compared with other psychotherapeutic approaches ($d = .05$). The author concluded, as have other investigators in this area, that various psychotherapies do not differ significantly in effectiveness.

In a separate evaluation of brief dynamic psychotherapy, Horowitz et al. (1988) used the SCL-90-R to assess symptomatic distress during a 10-week waiting period, followed by 20 sessions of active treatment. Results showed a slight, but real reduction in distress levels during the 10-week waiting period, followed by a dramatic reduction in distress during the first 10 psychotherapy sessions. No further reduction in distress was noted in sessions 10 through 20, probably because mean distress levels had reached the margins of the normal range by session 10 and were unlikely to drop much further. As has been observed previously, these authors concluded that symptomatic improvement appears to take place predominantly during the earlier phases of treatment.

In a somewhat different study, Winton et al. (1991) evaluated the efficacy of two distinct variations of brief dynamic psychotherapy in a sample of nonacting-out personality disorders. Patients were assigned randomly to one of the two treatment paradigms on a once-per-week treatment schedule with a maximum of 40 sessions. Results showed a significant reduction in distress on the GSI and four of the primary symptom dimensions (anxiety, phobic anxiety, depression, and psychoticism) from admission to termination for both treatments compared with controls. Moderate to large effect sizes were associated with these differences. In addition, anxiety and phobic anxiety significantly discriminated one intervention group from controls, whereas depression and psychoticism distinguished the second therapeutic approach. The two treatment groups were not significantly different from each other on any measures.

Several recent studies with the SCL-90-R and the BSI evaluated alternates to dynamic psychotherapies. Fairburn et al. (1991) compared two variations of cognitive behavior therapy and interpersonal therapy in a cohort of 75 patients diagnosed with bulimia nervosa. The SCL-90-R revealed significant efficacy for all three treatment approaches from baseline to treatment termination. However, no significant differential treatment effects were observed for any of the three treatments. The predominant symptomatology in this sample was depressive in nature, and mean severity of distress (i.e., GSI scores) dropped from the 98th percentile to the 85th percentile of the community female norm during treatment. In a similar treatment design with elderly depressed patients, Thompson et al. (1987) used the BSI to evaluate differences in therapeutic outcome between cognitive, behavioral, and brief psychodynamic psychotherapies. All three therapeutic approaches showed significant reductions on anxiety and depression, as well as the GSI compared with controls. However, there were no significant therapeutic differences.

In contrast, Kabat-Zinn et al. (1992) demonstrated significant efficacy for a meditation-

based group stress reduction program with patients suffering from generalized anxiety disorder and panic disorder. Those patients whose GSI scores were above the 70th percentile on the SCL-90-R community nonpatient norm were observed to benefit disproportionately from this treatment intervention.

Recently, Beutler et al. (1991) employed the BSI in a comparison of the relative efficacy of group cognitive therapy, focused expressive psychotherapy, and supportive self-directed therapy in the treatment of major depressive disorder. Patient coping style (i.e., externalization/internalization, high/low defensiveness) was introduced in the design as a mediating variable. Study results had substantial implications for treatment planning, in that very significant interactions were observed between improvement (i.e., reduced BSI scores), type of therapy, and the patient's predominant coping style. Relating more to psychotherapy process, Pekarik (1983) found the BSI to discriminate effectively among patients who gave different reasons for dropping out of outpatient psychotherapy, whereas Gilbar and Kaplan-Denour (1988) used the BSI to demonstrate significantly elevated levels of psychological distress among cancer patients who dropped out of cancer chemotherapy treatment versus those who remained to protocol completion.

Obviously, for an instrument to be optimally useful in treatment planning, it must be sensitive not only to psychotherapeutic effects, but to variations in psychopathology and other therapeutic influences as well. Waryszak (1982) published an interesting prospective study on symptomatic distress in a sample of Australian psychiatric inpatients. Using the SCL-90-R, he evaluated patients at admission to the unit and at both 1-month and 4-months postdischarge. Findings showed that symptomatic distress was reduced significantly from admission to 1-month follow-up, and continued to show significant reductions at 4-months postrelease. General severity levels dropped from approximately the 98th percentile to the 84th percentile of the community norm during the period from admission to the 4-month follow-up. Concurrent measurement of social adjustment showed a much slower and less dramatic recovery in this period.

In another prospective study, Wicki and Angst (1991) demonstrated in a community sample of young adults that individuals who subsequently went on to receive a formal diagnosis of hypomania revealed significant elevations in symptomatology 7 years previously on the SCL-90-R. Most subscales showed a heightened sensitivity in those ultimately receiving a diagnosis, with paranoid ideation and interpersonal sensitivity revealing the largest predictive effects.

In a dramatic demonstration of treatment-relevant differential sensitivity for the SCL-90-R, Rosenberg, Bech, Møllergaard, and Ottosson (1991) used the SCL-90-R to discriminate various categories of panic patients with and without comorbid clinical depression. The SCL-90-R demonstrated significant differences between patients diagnosed as having concomitant major depression, minor depression, and absence of mood disorder based on the Hamilton Rating Scale for Depression. In addition, the SCL-90-R also effectively discriminated between diagnostic categories of current major depressive episode, other mood disorder, and no mood disorder based on the Standardized Clinical Interview for Diagnosis of DSM-III disorders (SCID). The authors concluded that the data support a common diathesis for panic and mood disorders, with more severe examples of the condition being characterized by symptoms of both anxiety and depression. Vollrath, Koch, and Angst (1990) also reported recently on comparisons of patients with panic disorder versus those with panic and comorbid depression using the SCL-90-R. These investigators found that the phobic anxiety dimension and, to a lesser degree, the anxiety dimension discriminated these subgroups, with the panic/depression group revealing greater general severity and the indication of a more specific nosology.

A prominent issue in treatment planning concerns the reliable early identification of the potentially suicidal patient. Several recent studies have addressed this question using the SCL-90-R/BSI. Bulik, Carpenter, Kupfer, and Frank (1990) contrasted 67 patients suffering from recurrent major depression and a history of attempted suicide with 163 recurrent depressives without a history of suicidal behavior. Four subscales (somatization, interpersonal sensitivity, paranoid ideation, and psychoticism) as well as the global scores significantly discriminated positive from negative attempters. A logistic regression analysis involving these and other variables enabled 77% correct prediction of cases.

There is increasing evidence (Coryell, 1988) that panic disorder has associated with it an increased risk for suicide, just as a diagnosis of depression. In an analogous evaluation of panic patients who did and did not attempt suicide, Noyes et al. (1991) reported findings similar to those of Bulik et al. (1990). Seven of the nine primary symptom dimensions of the SCL-90-R and the GSI successfully discriminated suicide attempters from those who did not make attempts. Like Bulik et al. (1990), these investigators found patients who made suicide attempts had greater severity of distress in general, with particular elevations on measures of inferiority feelings and self-deprecation.

Cohen, Test, and Brown (1990) employed the BSI, among other measures, to predict potential for suicide among schizophrenic patients being treated in a community treatment center. Eight of the 82 patients in the sample eventually committed suicide. In addition to greater dissatisfaction with their lives at the time of admission, these patients revealed significantly higher distress levels on most measures of the BSI.

Swedo et al. (1991) recently extended the predictive validity of the SCL-90-R relative to suicidal behavior to suicidal adolescents. These authors compared adolescents with a history of attempted suicide to adolescents judged to be at risk for suicide for a variety of reasons, and an adolescent control group. All SCL-90-R measures successfully distinguished the attempters from controls; the majority of subscales differentiated those at risk from controls; and the obsessive-compulsive subscore and the PSDI significantly discriminated the attempters from those at risk. Like their adult counterparts, adolescents who actually attempt suicide tend to perceive themselves as more distressed and hopeless than other adolescents who are at risk.

Because of the relatively high prevalence of alcohol and substance abuse disorder, and their prominent comorbidity with other psychiatric disorders, evidence of the utility of the SCL-90-R/BSI in treatment planning with these classes of patients is important. Desoto, O'Donnell, Allred, and Lopes (1985) completed an informative study on the recovery from alcoholism over time. They compared the symptomatology of 363 recovering alcoholics on the SCL-90-R across five temporal abstinence groups (6 months <, 6 months–2 years, 2–5 years, 5–10 years, > 10 years). Results showed a slow, but progressive reduction in symptomatic distress over the 10-year period (mean GSI = 1.04, 0.74, 0.56, 0.48, 0.37, respectively, for the five groups). Early during recovery, dramatic levels of distress were in evidence, followed by eventual reductions to normative levels. Normal levels of distress were not reached for 5 to 10 years, however. The most prominent elevations occurred on depression, interpersonal sensitivity, obsessive-compulsive, psychoticism, and anxiety subscales, with the symptom of guilt being predominant. Distress on these measures eventually fell to normal levels. However, the investigators noted a residual syndrome of cognitive dysfunction that remained present even after many years of abstinence.

Because alcoholism rarely occurs as a completely independent condition, it is important in developing optimal treatment strategies to identify subtypes of the disorder that have relevance for treatment course and outcome. A recent study by Liskow, Powell, Nickel, and Penick (1991a) used both the SCL-90-R and the MMPI to discriminate four diagnostic

subtypes among a sample of 360 male inpatient alcoholics. Twenty-nine percent of the sample was found to have a comorbid antisocial personality disorder (ASP). These were further discriminated into ASP and alcoholism, ASP and alcoholism plus drug dependence, and ASP and alcoholism plus depression. The SCL-90-R profiles for the four groups were highly discriminated, an important characteristic for treatment planning, because these subtypes were observed to differ substantially in terms of onsets, severity, course of alcoholism, and pattern of medical complications. A 1-year follow-up study reported by these same authors (Liskow, Powell, Nickel & Penick, 1991b) showed that the ASP plus drug dependence subgroup showed the poorest rate of improvement, whereas the ASP plus depression subgroup showed substantial improvement. They concluded that the presence of additional drug problems in ASP alcoholics was a poor prognostic sign, whereas the presence of clinical depression indicated a high probability of successful treatment. In a study more oriented toward treatment evaluation, Dongier, Vachon, and Schwartz (1991) utilized the SCL-90-R to help evaluate the efficacy of bromocriptine as a treatment for alcohol dependence in an 8-week double blind, randomized trial with ambulatory alcoholics. Results showed the SCL-90-R interpersonal sensitivity and hostility subscales, and all three global measures, to significantly discriminate the bromocriptine versus placebo groups, with depression, somatization and paranoid ideation revealing marginally significant differences.

Turning to drug dependency, a number of researchers recently have published studies with the SCL-90-R that have high relevance for treatment design. Carey, Carey, and Meisler (1991) demonstrated the dual impact of comorbid conditions in a study contrasting a heterogeneous sample of psychiatric patients who also abused drugs with a matched sample of psychiatric outpatients with no history of drug abuse. The sample with additional drug abuse had significantly higher symptom distress scores on six of nine subscales and all three globals of the SCL-90-R. Following on the work of Rounsaville, et al. (1983), which showed a sensitivity of 89% for the SCL-90-R in detecting psychopathology among heroin addicts, Steer, Platt, Hendriks, and Metzger (1989) used modal profile analysis with Dutch and American cohorts of heroin addicts to identify three distinct subtypes based on the SCL-90-R: anxious-depressed, hostile, and paranoid. In addition to the observation that the paranoid subtype was much more likely to also use marijuana, the authors discussed a number of distinct treatment planning options that could hinge on the availability of this information. The same group of investigators (Steer et al., 1989) conducted a similar analysis of SCL-90-R data from 458 methadone patients. They observed the same three modal subtypes and, in addition, defined a fourth somaticizing subtype. The potential utility and impact on treatment planning of subtype membership in this group of chemical abusers was also discussed. Finally, in demonstrating its sensitivity to differential levels of psychopathology in the patient with substance abuse, Kleinman et al. (1990) administered the SCL-90-R to three distinct groups of cocaine abusers: (a) those free of any additional DSM-III-R diagnosis, (b) those with an additional DSM-III-R Axis II (personality disorder) diagnosis, and (c) those with an additional DSM-III-R Axis I (clinical) diagnosis. Mean GSI scores for the three groups were 0.53, 0.65, and 0.87, respectively, illustrating high levels of discriminative sensitivity.

Psychological factors play an obvious role in the etiologies and courses of many medical conditions, a fact that has been well documented for decades. Information on psychological status has only infrequently been integrated into treatment plans in such patient groups, in large measure because physicians in charge of these patients find methods of obtaining such data unfamiliar and arcane. The studies cited next are a small sample of those done with the SCL-90-R in medical cohorts, but indicate the potential value of brief measures of psychological distress for treatment planning in medical populations.

Johnstone et al. (1991) reported an interesting differential response to treatment in two groups of cancer patients (testis vs. Hodgkins) comparable in prognosis and treatment intensity. Standard treatment protocols were utilized with both groups. Although both patient cohorts showed elevated SCL-90-R profiles at the beginning of treatment, Hodgkins patients revealed a marked reduction in psychological distress at follow-up evaluation 3-months posttreatment. No comparable reduction in distress was apparent among testis patients, even though they had been informed that their chances for survival were quite good. Interestingly, the partners of both patient groups showed a return to normal levels of psychological distress following treatment. Levine, Raczynski, and Carpenter (1991) also used the SCL-90-R as a measure in a study of weight gain among breast cancer patients undergoing adjuvant treatment. They observed a significant relationship between a number of SCL-90-R measures and weight gain. Global measures of distress showed a positive relationship to weight. However, both obsessive-compulsive and interpersonal sensitivity subscales had significant negative coefficients in a regression equation.

In another recent study, Fricchione et al. (1992) evaluated psychological distress patterns among patients with end-stage renal disease who had been identified as high and low deniers. Significantly reduced scores were in evidence among high deniers compared with low deniers on the majority of SCL-90-R subscales and globals. The treatment implications for the detection and treatment of mood disorders among the high deniers were discussed and interpreted by the authors. Malec and Neimeyer (1983) used the SCL-90-R among spinal cord injured (SCI) patients with the anticipation of predicting length of inpatient rehabilitation and quality of performance of self-care at discharge. Results of the study showed the depression subscale to be the best predictor of length of stay, whereas the GSI had the highest (inverse) correlation with a discharge self-care rating. The authors concluded by recommending such brief psychological measures as having substantial utility for treatment planning in SCI patients. In an interesting discrimination of distress levels within the same condition, Sullivan et al. (1988) used the SCL-90-R to contrast patients suffering from tinnitus and diagnosed as depressed from tinnitus patients who were free of depression and hearing-impaired controls. All SCL-90-R measures significantly discriminated the tinnitus plus major depression group from both of the other two samples.

The SCL-90-R has also been utilized effectively in treatment planning studies with more of a health-care systems orientation. Saravay, Steinberg, Weinschel, Pollack, and Aloviz (1991) used it to evaluate the impact of psychological morbidity and length of stay (LOS) in the general hospital. SCL-90-R depression, anxiety, and global scores were significantly correlated with length of stay, although psychiatric diagnosis did not predict LOS. Similarly, Katon et al. (1990) used the SCL-90-R to define *highly distressed* patients among 767 high health-care utilizers in a large HMO. Fifty-one percent of the sample fit the criterion. Not only did these patients make disproportionate use of health-care facilities, but they also revealed a high prevalence of chronic medical problems, experienced significant limitation of activities associated with their illnesses, and had substantially elevated prevalences of major depressive disorder, dysthymia, and anxiety disorders. From a somewhat analogous perspective, Drossman et al. (1991) evaluated the nature of health-care behavior in a sample of almost 1,000 patients with inflammatory bowel disease. The SCL-90-R was one measure of psychological status utilized, and was found to have significant predictive value in a regression model predicting number of physician visits during the previous 6 months.

The SCL-90-R and the BSI as Treatment Outcome Measures

Ideally, a psychological distress measure employed as an outcome instrument will be sensitive to a broad spectrum of treatment interventions and will demonstrate sensitivity to change along the complete psychological distress continuum, from mild distress (e.g., stress) to dramatic psychopathologic manifestations (e.g., major depressive episode). To the extent that the measure's sensitivity is limited, along either the psychological distress continuum or the spectrum of therapeutic interventions, its usefulness as an outcome measure is seriously constrained. From both the section that preceded this one as well as the information that follows, it is clear that the SCL-90-R and the BSI perform well in terms of these criteria. Drug trials involving the entire range of pharmacotherapeutic agents have repeatedly documented the sensitivity of these instruments to therapeutic change. Similarly, the review of psychotherapy outcome studies documented here show these tests' sensitivity to a broad array of traditional and nontraditional psychotherapeutic interventions. There also is ample evidence that the SCL-90-R and BSI are sensitive to change throughout the psychological distress continuum, from the mild anxiety and dysphoria associated with stress states to formal psychiatric disorders.

For a psychological test to be optimally useful as a treatment outcome measure, it should document the posttreatment condition of the patient in real-world terms (i.e., terms that establish the postintervention status of the patient in a clinically meaningful manner). It is not sufficient to simply indicate a respondent's posttreatment score, or even that there was a reduction or change in score of a particular magnitude. Because the constructs by which mental health outcomes are assessed (e.g., distress, depression) are hypothetical in nature, units of measurements associated with them carry no intrinsic meaning. The meaning of a particular score or magnitude of change value must be derived externally from a representative actuarial database (norm) for the test, which characterizes a referent population in terms of test score distributions. The norm describes the expectancy of a score in probabilistic terms in the particular population of interest (e.g., community respondents, psychiatric inpatients) and establishes an associated centile equivalent to facilitate interpretation. Ideally, continuing empirical research will result in more specific and refined norms, which in turn enable more precise clinical interpretations.

Both the SCL-90-R and the BSI have appropriate sets of standardized norms, and additional specific norms (e.g., geriatric) are under development. Unfortunately, the majority of current psychological test norms are of the point-in-time variety, which represent an individual's status relative to the constructs being measured at a particular temporal moment. Although such norms are adequate for some assessment applications (e.g., aptitude, achievement evaluations), in clinical outcome measurement the focus is on treatment-induced change. For optimal utilization, change or delta norms should be developed for our outcome measures that will characterize the probability of achieving any of an entire range of post-treatment scores, given a representative range of pretreatment or baseline values. Because absolute magnitudes of change often have distinct meanings at different points on the measurement continuum (e.g., four points difference between the 95th and 99th percentiles versus four points between the 50th and 54th percentile), it is essential that change measurement be formalized in an actuarial manner.

The technical aspects of building delta norms are no longer particularly forbidding, given the general availability of high-speed personal computers. However, even more than traditional norms, specificity will be required of change norms if they are to have utility. As an

example, norms of a general nature, such as "Psychiatric Outpatients Pre- and Post-Six Months of Treatment," will probably be of little value. More likely, a change norm such as "Major Depressive Episode Pre- and Post-Six Weeks Treatment with an Active Antidepressant Drug" will represent a more clinically meaningful referent. There is obviously much more effort involved in generating change norms. However, the enhanced precision in outcome assessment more than justifies the endeavor.

Obviously, outcomes in mental health take place over varying periods of time, from weeks to months and even years. Test-retest reliabilities on the SCL-90-R and BSI reveal them to possess good temporal stability, and numerous studies documented here show them to be sensitive to therapeutic effects many weeks and months subsequent to baseline, without degradation of measurement quality. An associated question arising from clinicians and investigators involved in outcome measurement is, "How frequently should outcome assessments be conducted?" There is no definitive answer to this question, because assessment frequency should be determined by what is relevant for judicious clinical decisionmaking. Traditionally, drug treatments and psychotherapeutic interventions are evaluated on a weekly assessment basis, whereas maintenance regimens and follow-up studies are often assessed quarterly or semiannually.

Limitations and caveats regarding the use of the SCL-90-R and BSI are relatively few and primarily involve occasional tendencies to mis- or overinterpret the protocol. These instruments measure symptomatic psychological distress, and, although primary dimension labels are consistent with the labels of certain diagnostic entities, it is not possible to make diagnoses solely on the basis of a point-in-time assessment instrument. The instruments are also intended to be employed in their entirety; pieces of these tests may not be validly applied. Finally, because the SCL-90-R and BSI are self-report instruments, the intrinsic limitations associated with valid self-report apply. These constraints are not unduly limiting to outcome measurement, they simply require that these instruments be utilized realistically.

PSYCHOPHARMACOLOGY OUTCOMES

Pharmacotherapeutic drugs represent one of the cornerstones of the modern treatment of psychiatric disorders, both in conjunction with psychotherapeutic approaches and as sole interventions in these conditions. Although drug-drug comparisons are often quite demanding psychometrically when similar drugs are involved (Derogatis, Bonato, & Yang, 1968), an acceptable outcome measure must be at least sensitive to drug versus placebo differences across a broad range of contexts. The SCL-90-R has been used as a principal self-report outcome measure in drug trials for almost 20 years, and has accrued substantial validity in this capacity.

As examples, Ravaris, Robinson, Ives, Nies, and Bartlett (1980) used the SCL-90-R in the first definitive double blind controlled trial comparing a monoamine oxidase inhibitor (MAOI) with a tricyclic antidepressant (TCA). These investigators compared the tricyclic antidepressant amitriptyline to the MAO inhibitor phenelzine in the treatment of 105 outpatient depressives. Results demonstrated both drugs to have significant efficacy beyond placebo in reducing symptomatic distress over the 6 weeks of the trial, and in drug-drug comparisons phenelzine proved significantly better than amitriptyline in reducing anxiety. The study showed, by comparisons with community norms for the SCL-90-R, that although distress was significantly reduced at the end of 6 weeks, it remained elevated beyond normal levels. The SCL-90-R also served as one of the principal outcome measures in a large multicenter

trial (Ballenger et al., 1988) evaluating the efficacy of alprazolam (Xanax) in the treatment of panic disorder and agoraphobia. In this study, the scale demonstrated substantial efficacy for alprazolam compared to placebo.

In the specialized patient setting, Levine, Anderson, Bystritsky, and Baron (1990) used the SCL-90-R in a small sample of HIV patients with major depressive syndrome who were treated with fluoxetine (Prozac). They observed significant improvement on almost all SCL-90-R measures over the 4 weeks of active treatment, and treatment gains were sustained at 2-months follow-up. Walsh, Hadigan, Devlin, Gladis, and Roose (1991) also used the SCL-90-R in a three-phase evaluation of the efficacy of desipramine in the treatment of depressed bulimics. Four of the primary dimension scores and the GSI revealed significant efficacy for the active drug over placebo. In another somewhat unique trial, Perse, Greist, Jefferson, Rosenfeld, and Dar (1987) employed the SCL-90-R to assess the efficacy of fluvoxamine to treat obsessive-compulsive disorder in a 20-week, double blind crossover design against placebo. Eighty-one percent on the active drug versus 19% on placebo improved with numerous SCL-90-R scales, particularly the obsessive-compulsive dimension, demonstrating efficacy.

Focusing on cost-efficiency/cost-benefit issues, Marder et al. (1984) contrasted the costs versus benefits in a double blind comparison of 5 mg versus 25 mg of the depot neuroleptic fluphenazine decanoate with schizophrenic outpatients. The SCL-90-R was used to assess symptomatic distress, and patients were followed for 1 year. Analyses of SCL-90-R data at 1-month and 3-months postinitiation showed the high-dose group to have significantly higher levels of distress on a number of SCL-90-R subscales. In addition, drug side effects were more severe in the high-dose group and relapse percentages were no better than in low-dose patients. No advantage was found for continuing the high-dose regimen.

In a strong demonstration of the SCL-90-R's sensitivity to drug effects, Noyes et al. (1984) reported a double blind crossover comparison of diazepam (Valium) versus the beta-blocker propranolol (Inderal) in the treatment of panic-driven agoraphobia. SCL-90-R measures of anxiety, phobic anxiety, and the GSI showed significant efficacy for diazepam against propranolol in this study, in which no placebo group was involved. More recently, psychopharmacologists increasingly have attempted to treat Axis II personality disorders with pharmacologic agents. Consistent with this posture, Teicher et al. (1989) reported on an open trial of low-dose thioridazine (Mellaril) in the treatment of borderline personality disorder. The SCL-90-R was utilized as a self-report measure of psychopathology. Results showed significant reductions in many SCL-90-R subscales, particularly for the subgroup who completed the full 12 weeks of the study. Similarly, Cornelius, Soloff, Perel, and Ulrich (1990), theorizing borderline personality disorder to be a condition based in deranged serotonin regulation, utilized the SCL-90-R as an outcome measure in an 8-week trial of the serotonin uptake inhibitor fluoxetine (Prozac). The majority of SCL-90-R measures were sensitive to a therapeutic effect for the drug over the 8-week period. In another recent fluoxetine study, Kim and Dysken (1990) used the SCL-90-R as an outcome assessment in a 12-week open trial with obsessive-compulsive disorder (OCD). Focusing on the obsessive-compulsive subscale of the instrument, these investigators found significant reductions from baseline to treatment completion.

Although clomipramine (Anafranil) is noted for its therapeutic effects in obsessive-compulsive disorder, Judd et al. (1990) also utilized the drug in a therapeutic trial with patients suffering from panic disorder. In an 8-week treatment trial, the SCL-90-R reflected significant reductions in distress on most subscales, particularly on the anxiety dimension. Similarly, Kahn et al. (1987) contrasted clomipramine with 5-hydroxytryptophan in an 8-week double blind, placebo-controlled trial with mixed anxiety disorders. Both drugs were

significantly superior to placebo, and clomipramine showed significantly greater efficacy in treating depressive symptomatology in these patients. An analogous study comparing clomipramine with fluvoxamine in the same population revealed both drugs to be superior to placebo, but in drug-drug comparisons clomipramine also was superior to fluvoxamine on a number of SCL-90-R measures. Taken together, these studies not only demonstrate the requisite sensitivity to drug-placebo comparisons essential in a psychopharmacologic outcome measure, but reveal the much more demanding capacity to identify differences between active pharmacotherapeutic drugs of the same functional class.

Finally, in a recent study focused on addictive complications in the drug treatment of anxiety, Rickels, Case, Schweizer, Garcia-Espana, and Fridman (1991) used the SCL-90-R to assess the follow-up psychopathology of patients chemically dependent on benzodiazepines who had been involved in a discontinuation program versus those who did not complete the program. Three years after participation, those still using benzodiazepines revealed dramatically higher levels of anxiety and depression on the SCL-90-R than those who no longer systematically used anxiolytics.

PSYCHOTHERAPY OUTCOMES

Although previously mentioned in the context of treatment planning, the recent meta-analysis of brief dynamic psychotherapy (BDP) studies reported by Crits-Cristoph (1992) represented a convincing demonstration of the sensitivity of the SCL-90-R to psychotherapy outcomes. It showed sensitivity to BDP efficacy compared with waiting list control across almost one dozen outcome studies. These results are consistent with those of earlier psychotherapy trials. For example, Horowitz, Marmar, Weiss, Dewitt, and Rosenbaum (1984) studied the efficacy of BDP with bereaved individuals. They found SCL-90-R anxiety and depression subscales and globals were highly sensitive to treatment-induced improvement. They further noted that magnitude of distress reduction was correlated significantly with baseline distress levels. Woody et al. (1983) also used the SCL-90-R in their evaluation of two brief psychotherapeutic interventions (i.e., cognitive behavioral, supportive-expressive) compared with standard drug counseling with a sample of 110 opiate addicts. Clients exposed to either of the psychotherapeutic regimens showed significantly greater reductions in distress than the standard counseling group, but there were no significant differences between the two psychotherapeutic methods.

The SCL-90-R has also demonstrated sensitivity to the therapeutic impact of less typical methods. Bohachick (1984) reported significant reductions in distress among a cohort of hypertensives exposed to the addition of a progressive relaxation paradigm to their standard exercise regimen compared with exercise only. Carrington et al. (1980) compared two distinct meditation techniques to progressive relaxation and waiting list control in a sample of 154 self-defined high-stress individuals. Evaluations at the end of 6 months on the SCL-90-R revealed the two meditation techniques to be significantly better than progressive relaxation at reducing symptomatic distress. In one of the more unusual therapeutic outcome studies in the professional literature, Griffith, Mahy, and Young (1986) reported significant reductions in symptomatic distress as a result of participation in the West Indian ritual of Spiritual Baptist mourning. With the exception of the somatization dimension, all SCL-90-R measures showed significant efficacy for the solitary contemplative experience in reducing psychological symptomatic distress.

Selmi, Klein, Greist, Sorrell, and Erdman (1990) also utilized the SCL-90-R in an atypi-

cal outcome study, in which one arm of a cognitive behavior therapy (CBT) trial designed to treat depression was administered by computer. The other two arms were standard CBT and waiting list control. The dimension and global measures of the SCL-90-R showed superiority for both active treatments compared with control. Extending its use to a somewhat different therapeutic focus, Waring, Carver, Stalker, Fry, and Schaefer (1990) used the test in a randomized trial of cognitive marital therapy. Although marital intimacy and satisfaction did not improve over the 10-session treatment, the SCL-90-R demonstrated significant reductions in symptomatic distress.

One of the most systematic utilizations of the SCL-90-R in psychotherapy outcome research has occurred in the British investigations known as the Sheffield Psychotherapy Projects. In the first of these (Shapiro & Firth, 1987), depressed and anxious patients were randomly assigned to either cognitive-behavioral or brief psychodynamic therapies for successive 8-week periods in a crossover design. The SCL-90-R demonstrated that both interventions were effective in reducing distress, although CBT proved slightly more effective. Further analysis of follow-up data (Shapiro & Firth-Cozens, 1990) showed a correlation of .64 ($p < .01$) between treatment completion and 2-year follow-up assessments on the SCL-90-R. In the second project (Shapiro, Barkham, Hardy, & Morrison, 1990), 120 white-collar professionals suffering from depression received either 8 or 16 sessions of one or the other treatment, in a 2×2 design. Preliminary findings indicate substantial improvement for both interventions and durations of approximately the same magnitude.

ANXIETY AND DEPRESSIVE DISORDER OUTCOMES

There is compelling evidence (Derogatis & DellaPietra, this volume; Derogatis & Wise, 1989) that anxiety and depressive disorders account for between 75% and 80% of the psychiatric conditions seen in either the community or primary care practice. A number of authorities estimates that major depressive disorder is the most prevalent clinical problem in primary care (Katon & Sullivan, 1990). For these reasons, we have included a section specific to these disorders.

The SCL-90-R has been used as an outcome measure in many studies focused on depression. Weissman et al. (1977) used the instrument to characterize primary versus secondary depressions, and the same research group used the scale in an epidemiologic study of depression in five psychiatric populations (Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977). Quitkin et al. (1984) used the test as an outcome measure in a treatment trial of I-deprenyl in atypical depressives, and found it sensitive to drug-placebo differences on a number of dimensions. Meanwhile, Wetzler et al. (1990) profiled depressed versus panic patients on the SCL-90-R, and Stewert, Quitkin, Terman, and Terman (1990) contrasted atypical depressions with seasonal affective disorders on the scale. Bryer, Borrelli, Matthews, and Kornetsky (1983) used the SCL-90-R in a depressed sample to predict suppressors versus nonsuppressors on the dexamethasone suppression test (DST). Employing discriminant function analysis, these investigators correctly predicted DST status in 73% of cases. Working with a community cohort of young adults, Angst and Dobler-Mikola (1984) reported discriminating among three groups of depressives with the SCL-90-R, partitioned according to frequency and duration of episodes. Discriminations among groups were made at both the subscale and item levels. In an interesting predictive validity study, Robinson, Olmsted, and Garner (1989) found that they could predict, from elevated SCL-90-R scores during the

second trimester of pregnancy, those women who would have difficulties adjusting 1-year postpartum. Katon and Sullivan (1990) recently reviewed depression occurring among chronic medical populations and enumerated a number of impressive studies done with the SCL-90-R.

In the case of anxiety disorders, Cameron et al. (1986) used the SCL-90-R to profile patients with distinct DSM-III anxiety disorders. This same research group (Cameron & Hudson, 1986) employed the instrument in an engaging study to evaluate the influence of exercise on severity of anxiety in patients diagnosed with anxiety disorders. Thirty-one percent of patients with panic attacks were exercise sensitive, compared with only 7% of other patients. The SCL-90-R anxiety and phobic anxiety subscales were particularly effective in making this discrimination. Ae Lee and Cameron (1986) also evaluated the relationship between Type-A behavior, symptom distress patterns, and family history of coronary heart disease among males and females with anxiety disorders. Significant correlations between SCL-90-R anxiety and hostility scores and Jenkins Activity Scale (JAS) Type-A scores were observed among males, but not among female patients. These same investigators (Ae Lee, Cameron, & Greden, 1985) also used the instrument to evaluate the relationship between caffeine consumption and the experience of anxiety in anxious patients. They discovered that severity of anxiety was not related to amount of caffeine consumption, but that the subset of patients who reported becoming anxious in response to drinking coffee had higher SCL-90-R anxiety, somatization, and phobic anxiety scores than those who did not, even though their daily consumption of caffeine was equivalent.

In a recent comprehensive review, Katon and Roy-Byrne (1991) argued for the existence of a subclinical mixed anxiety-depression syndrome. They cited compelling evidence to substantiate the existence of this subdiagnostic syndrome, with studies involving the SCL-90-R contributing substantial confirmatory data. Individuals afflicted with the condition are found to have a high incidence of medically unexplained problems and to be proportionally greater utilizers of health-care systems. They are also observed to be at increased risk for more severe anxiety and mood disorders. Similarly, Clark and Watson (1991) developed a tripartite model of anxiety and depression. Based on an impressive meta-analysis of psychometric data, they argued that at the clinical level, anxiety and depressive phenomena may be explained by a general distress factor and two additional specific factors of anxiety and depression. The authors mobilized an impressive body of data to support their theory, in particular noting that this pattern was very explicit in numerous studies with the SCL-90-R. Also examining the relationship between anxious, depressed, and anxious/depressed states, Strauman (1992), working from a self-discrepancy theory model, utilized the anxiety subscale of the SCL-90-R to predict specific vulnerabilities to emotional disorders. The hypothesized patterns of vulnerability (i.e., anxious vs. depressive symptoms and affects) were theoretically based in actual-ideal versus actual-ought self-discrepancies, and were strongly confirmed by the outcome of the study.

STRESS OUTCOMES

Although some theorists view the construct of stress as simply a variant of anxiety, with perhaps a more explicit environmental linkage, stress research has arisen from distinct origins. Posttraumatic Stress Disorder (PTSD) has been conferred independent nosologic status in DSM-III, and Horowitz, Wilner, Kaltreider, and Alvarez (1980) used the SCL-90-R

to help characterize its distinction from other anxiety-based disorders. Davidson, Kudler, Saunders, and Smith (1991) also used the SCL-90-R to profile the symptom patterns and severity of PTSD in groups of World War II versus Vietnam veterans. Vietnam vets exhibited more severe PTSD symptom and revealed higher stress scores on a number of SCL-90-R subscales. Evaluating stress in a more medical context, Klein and Nimorwicz (1982) used the SCL-90-R to evaluate symptomatic stress in parents of children suffering from hemophilia. Mothers of the children showed clear symptom elevations on the majority of SCL-90-R subscales, whereas fathers' profiles were generally within normal limits except for their somatization score, which was above the 90th percentile. Focusing on environmental stressors, Fleming, Baum, Gisriel, and Gatchel (1982) employed the SCL-90-R to evaluate stress arising from the Three Mile Island nuclear accident, and how it was mediated by varying levels of social support. Compared with controls, those exposed as a result of the accident revealed higher general levels of stress. However, stress levels were mediated strongly in most instances by levels of social support. High social support residents did not differ significantly from controls in most instances. In a unique study of environmentally determined stress, Girodo (1991) used the SCL-90-R to profile the stress levels of federal undercover agents prior to, during, and subsequent to being on undercover assignments. Severity of symptomatic distress was found to be highest among active undercover agents. Agents currently on assignment had profiles that were extremely similar to those of psychiatric outpatients, with the exception that depression scores were not nearly as elevated. Preoperational agents, who had not been on an undercover assignment, had the lowest stress profile, with postoperational agents who had completed their assignments falling in a median position.

A well-documented source of stress, the effects of which often extend for many years into the future, is abuse. Both physical and sexual abuse, particularly during childhood, are extremely traumatic experiences that can have dramatic psychological sequelae. Kelly (1990) reported a study dealing with the stress engendered in the parents of children who have been abused. She contrasted SCL-90-R symptom profiles of parents of children who were sexually abused, a second group whose children were ritually abused in the context of cult worship, and the parents of nonabused controls. Results showed both groups of parents of abused children displayed significantly elevated profiles, with the parents of the ritually abused children being significantly more distressed than the parents of the other abuse group. Also using the SCL-90-R, Williamson, Borduin, and Howe (1991) compared the symptomatic distress of physically and sexually abused adolescents with those who had been neglected, and adolescents who had not been maltreated in any way. The SCL-90-R showed the two abuse groups to be much more dramatically distressed than nonmaltreated controls, with the neglect group falling in between.

Swett, Surrey, and Cohen (1990) studied abuse histories in 125 adult psychiatric outpatients with the purpose of comparing the symptomatic distress of patients with histories of abuse to those free of abuse experiences. SCL-90-R profiles of patients with histories of sexual and/or physical abuse were significantly higher than patients without such histories. Bryer, Nelson, Miller, and Kroll (1987) also studied the abuse histories of 66 female psychiatric inpatients and linked them to score profiles of the SCL-90-R. These researchers categorized patients as not abused, sexually abused, physically abused, and sexually and physically abused. Using discriminant function analysis and childhood abuse as the independent variable, they correctly assigned 72.7% of patients on the basis of the SCL-90-R. They also completed a multiple regression analysis with the GSI as the dependent variable. The significant predictive variables and their respective predictive variance percentages were early

sexual abuse (21.4%), alcohol abuse by father (10.2%), and early physical abuse (7.3%). The total $R^2 = 38.9\%$. In addition, SCL-90-R scores for nonabused subjects were significantly below its inpatient psychiatric norm, whereas those who were both sexually and physically abused were significantly elevated on this norm.

Finally, a fairly extensive amount of research on sexual function/dysfunction has utilized the SCL-90-R/BSI as an outcome measure relative to psychopathology and psychological distress. Derogatis et al. (1981) reported on 325 sexually dysfunctional patients who had been evaluated at the Johns Hopkins Sexual Consultation Unit. Approximately 50% of the female patients and one third of the males received DSM-II and DSM-III psychiatric diagnoses. SCL-90-R profiles of these individuals were elevated substantially beyond the community norm, also placing many of them in the clinical range. Althof et al. (1991) also utilized the SCL-90-R as a distress measure in a clinical trial of the locally injected vasodilators papaverine/phentolamine in the treatment of erectile disorder. The SCL-90-R profile showed significant reductions from baseline distress at 3-months and 6-months postinitiation. Similarly, symptomatic distress levels in response to treatment of erectile disorder with external vacuum device were evaluated by Turner et al. (1990) after 6 months of treatment. Eighty-nine percent of patients experienced success in treatment, with five SCL-90-R subscales showing significant reduction in distress. A 12-month follow-up study (Turner et al., 1991) revealed the efficacy rate holding at 87%, with 6 SCL-90-R measures showing significant distress reductions.

THE SCL-90 ANALOGUE (SCL-90-A) AND HOPKINS PSYCHIATRIC RATING SCALE (HPRS) IN OUTCOME RESEARCH

A specific potential advantage associated with SCL-90-R/BSI concerns the fact that well-constructed, matched clinical rating scales exist that may be used along with the self-report measures. If clinicians' judgments about the patient's psychological status are important to the project of interest, the same symptom constructs may be measured from both patient and clinician perspectives. Differences in perceptions can be evaluated accurately by comparing clinician judgments with patient self-ratings. Comparisons may be enhanced by converting both sets of measurements to respective area T scores, thereby conducting analyses in a common metric.

An example of the use of the clinician rating scales is provided by a study done by Derogatis, Abeloff, and McBeth (1976) with a small sample of cancer patients. Shortly after admission, patients completed an SCL-90-R. Subsequently, the primary treating oncologist filled out an SCL-90-A scale on the patient based on a clinical interview. Raw scores were converted to area T scores for each patient on each measure, and doctor-patient difference scores were calculated. Results showed that as physicians' ratings of global psychological distress rose, they tended to judge the patient to be increasingly distressed on interpersonal sensitivity and anxiety dimensions, but viewed much less distress arising from depression than did the patient. Analyses also showed that the highest subscale correlations with the physicians' global ratings of patient psychological distress were anxiety ($r = .50$) and hostility ($r = .48$). In correlations between the physicians' global distress ratings and the patients' SCL-90-R global scores, only the correlation with the PSDI ($r = .43$) was signifi-

cant. This result indicated that oncologists were basing their judgments on perceived magnitude of distress, rather than numbers of manifest symptoms.

In another study with cancer patients, Schleifer et al. (1991) used the SCL-90-A to evaluate factors that affect oncologists' adherence to chemotherapy protocols. The sample consisted of 107 breast cancer patients who were followed for 26 weeks of treatment. Fifty-two percent of patients experienced an unjustified regimen modification. Physician perception of psychological distress was not a significant factor in modifying prescription in the majority of protocols. However, on the vincristine protocol, the global severity score and a number of SCL-90-A subscale scores were significantly related to nonadherence. Steer and Hassett (1982) also used the SCL-90-A to identify the differential weights assigned various dimensions of psychopathology in arriving at staff judgments of global severity of illness. Over 1,000 mental health patients were contrasted with 809 substance abuse clients. They found that interpersonal sensitivity and psychoticism were the best predictors of global severity ratings in mental health patients, whereas anxiety and paranoid ideation scores accounted for most variance among ratings of substance abusers.

The HPRS has also been utilized in a variety of interesting studies. Winokur, Guthrie, Rickels, and Nael (1982) used the HPRS as a validating instrument for patients' self-ratings of psychological distress on the SCL-90-R. Approximately 60 nonpsychiatric medical patients from two settings participated in the trial. Two psychiatrists who were completely unaware of each others' or patients' self-report completed all HPRS ratings. Psychiatrist-patient correlations were generally high, with depression ($r = .63$), anxiety ($r = .63$), and phobic anxiety ($r = .72$) showing the highest agreement. The authors report sensitivities for the SCL-90-R depression factor of .91 and .89 in the two groups of patients, with specificities of .78 and .85, respectively. Perconte and Griger (1991) used both the HPRS and the SCL-90-R to discriminate differential treatment responders among Vietnam veterans suffering from posttraumatic stress disorder. Although the investigators did not report on levels of agreement between the two instruments, both were highly successful in discriminating successful, unchanged, and relapsing patients. Similarly, Fricchione et al. (1992) used the HPRS and the SCL-90-R to evaluate high versus low deniers among patients with end-stage renal disease. The HPRS subscales of interpersonal sensitivity, anxiety, and sleep disturbance were significantly elevated among the low deniers, as were numerous SCL-90-R scales discussed earlier.

Conclusion

The SCL-90-R/BSI, and their matching clinical rating scales represent a unique set of brief, multidimensional psychological test instruments for the assessment of psychopathology and psychological distress. Their successful use in hundreds of published research and clinical studies, across an extremely broad spectrum of community, medical and psychiatric applications, provides compelling evidence of their fundamental reliability, validity, and utility. Sensitivity to pharmacologic, psychotherapeutic, and other treatment interventions, as well as to clinically meaningful variations in psychopathology and psychological distress levels, confirms these tests as ideal for both psychiatric screening functions and clinical outcome measurement. The availability of the HPRS and the SCL-90-A as matching clinician rating scales contributes the additional capacity of obtaining clinician ratings on the same symptom constructs, and the instruments are available in over two-dozen languages.

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