

## RELATIONSHIPS OF SCL-90 PROFILES TO METHADONE PATIENTS' PSYCHOSOCIAL CHARACTERISTICS AND TREATMENT RESPONSE<sup>1</sup>

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### ABSTRACT

Four-hundred fifty-eight methadone patients were administered the Symptom Check List-90 (SCL-90). Four profile-shape components were identified by Modal Profile Analysis reflecting (1) Paranoid, (2) Somatic, (3) Hostile, and (4) Anxious-depressed syndromes. Spearman rank-order correlations were then calculated between these four profile-shape components and four same-named ones previously reported for the SCL-90-R with psychiatric patients; the shape components were similar for both instruments.

The four shape components were next correlated with the addicts' background and treatment characteristics. The paranoid shape was associated with smoking marijuana at a later age and currently using both heroin and marijuana; the somatic shape was related to earlier marijuana use, not being court mandated to treatment, and having current medical problems; the hostile shape was associated with being male, Black, using marijuana at an earlier age, and currently using amphetamines; and the anxious depressed shape was correlated with being Black, not being married, using marijuana at an earlier age, realizing that one had a drug problem at an earlier age, entering drug treatment at an earlier age, and not having a current health problem.

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### RELATIONSHIPS OF SCL-90 PROFILES TO METHADONE PATIENTS' PSYCHOSOCIAL CHARACTERISTICS AND TREATMENT RESPONSE

The prevalence of psychopathology, especially depression, in methadone patients is high (Ross, Glazer, & Germanson, 1988; Rounsaville, Glazer, Wilber, Weissman, & Kleber, 1983; Steer, Emery, & Beck, 1980; Weissman, Slobetz, Prusoff, Mezritz, & Howard, 1976; Woody et al., 1983), and the severity of their overall symptom distress is comparable to that described by psychiatric outpatients (Steer, 1982b). Furthermore, the types of self-reported syndromes of opioid abusers are similar to those of psychiatric outpatients diagnosed with ICD-9 mental disorders (Steer, 1982a).

The SCL-90-R (Derogatis, 1983) has been used for detecting psychopathology in methadone patients, monitoring changes during treatment, as well as for differentiating patients according to the types of treatment that they are seeking, such as ambulatory detoxification or methadone maintenance (Jacobs, Doft, & Koger, 1981; Rounsaville et al., 1983; Steer, 1982b; Steer, 1983; Weissman et al., 1976; Woody et al., 1983). However, there is little information about whether or not the types of psychopathology displayed by methadone patients differ with respect to the Symptom Check List-90 (Derogatis, Lipman, & Covi, 1973), the precursor of the SCL-90-R, which is still widely used in psychopharmacological research. Two SCL-90 items were replaced, and seven other items were rewritten to yield the SCL-90-R (Cyr, McKenna, Foley, & Peacock, 1985).

The purpose of the present study was (1) to determine whether or not the SCL-90 profiles of methadone patients were similar to the SCL-90-R profiles previously reported for outpatient psychiatric patients in general (Steer, 1982a) and (2) to ascertain whether any of the resultant profile characteristics were significantly related to the methadone patients' background and treatment characteristics. A profile represents contributions of elevation, scatter, and shape (Skinner, 1978). *Shape* is defined as the actual pattern of "ups and downs" across scores in a diagnostic profile; *scatter* reflects how dispersed the scores are from their mean across the profile; and *elevation* represents the mean score of the patient over all scores constituting the profile.

## METHOD

### PATIENTS

The 458 patients were drawn from six methadone programs within the Philadelphia SMA that were participating in a three-year NIDA-funded project to study the role of employment in the rehabilitation of methadone patients. Patients volunteering for the study completed a comprehensive intake battery from which the following information was obtained:

**BACKGROUND.** There were 307 (67.0%) men and 151 (33.0%) women. The racial composition was 242 (52.8%) White and 216 (47.2%) Black. With respect to marital status, 180 (39.3%) had never married, 131 (28.6%) were married or cohabitating, 78 (17.0%) were separated, 57 (12.4%) were divorced, and 1 (0.2%)

was widowed. The mean age was 34.13 (SD = 6.56) years old, and 141 (30.8%) were currently employed. The mean length of education was 11.10 (SD = 1.73) years.

**DRUG HISTORY.** All of the patients were daily heroin addicts upon admission, and the mean age at which heroin use had started was 18.53 (SD = 4.01) years old. Alcohol use had begun at the mean age of 14.99 (SD = 3.93) years old, and marijuana use had started at the mean age of 15.98 (SD = 3.77) years old. Only 49 (10.7%) claimed to have been previously treated for alcohol abuse, whereas 196 (42.8%) described having a current health problem, such as hepatitis. The mean number of drug arrests was 3.25 (SD = 6.83), and 153 (33.4%) had been ordered into treatment by the courts.

**TREATMENT.** The patients had first thought about seeking drug abuse treatment at the mean age of 21.38 (SD = 4.84), and the sample's mean age for actually entering treatment was 24.48 (SD = 5.91) years. The mean number of prior drug-abuse treatments was 2.79 (SD = 2.33), and the patients' mean length of current methadone treatment had been 27.46 (SD = 35.47) days at the time of testing. The mean methadone maintenance dose was 48.27 (SD = 19.96) mg, and 192 (42.1%) had take home privileges.

The self-reported illicit drug-abuse patterns of the addicts were skewed toward denying any current use. For example, 306 (66.8%) denied heroin use, 318 (69.4%) were not using cocaine, 404 (88.2%) claimed no amphetamine use, 327 (71.4%) described no barbiturate use, 265 (57.9%) were not smoking marijuana, and 233 (50.9%) did not drink alcoholic beverages.

## INSTRUMENT

The SCL-90 (Derogatis et al., 1973) was scored for its nine usual clinical scales reflecting (1) Somatization, (2) Obsessive-compulsiveness, (3) Interpersonal Sensitivity, (4) Depression, (5) Anxiety, (6) Hostility, (7) Phobic Anxiety, (8) Paranoid Ideation, and (9) Psychoticism. The SCL-90 was administered to the patients after they had volunteered for a study of employment patterns in heroin addicts which has been described in detail by Metzger and Platt (1987).

## DATA ANALYSIS

Modal Profile Analysis (MPA) (Skinner, 1979) was used to investigate the shape components of the profiles produced by the nine SCL-90 scores. The shape of each SCL-90 profile can be expressed as a linear function, and Skinner and Lei's (1980) FORTRAN program for MPA which isolates a profile's shape components by applying an ordination algorithm to the transposed inter-correlation matrix of the methadone patients' SCL-90 scores was used.

The *within* sample analysis for MPA began by randomly assigning the 458 methadone patients to subsamples of 100, 100, 100, 100, and 58 each to test for the generalizability of the resultant modal shape components with respect to sample fluctuations. A univocal principal-components analysis representing a two-stage least squares solution was then performed with the transposed patient inter-correlation matrix for each subsample; a tentative hypothesis of 1s and 0s was

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assigned to each patient based upon his or her initial varimax loading  $\geq .50$  on each component with an eigenvalue  $> 1.0$ . A least-squares comparison of the original component matrix to the hypothesis matrix was next calculated. The varimax rotation of the transposed matrix to the target matrix culminated in the assignment of each methadone patient to an "ideal person" shape component according to his or her having a salient loading ( $\geq .50$ ) on a component. For the five subsamples of 458 methadone patients, 16 *within* profiles of nine SCL-90 shape components emerged.

In the *between* subsample phase, another univocal-principal components analysis was conducted with the intercorrelations among the 16 profiles of SCL-90 component scores to determine whether or not a reduced set of modal shape components could be used to explain similar shapes across the five subsamples and thus with the total sample of methadone patients.

### RESULTS

Table 1 presents the means for the SCL-90 principal-components shape scores expressed as T-scores with means of 50 and standard deviations of 10. The effectiveness of the reduced set of shape components to represent the patients SCL-90 profiles was assessed by calculating linear classification estimates for assigning each of the 458 methadone patients to one of the four resultant shape components and by the percentage of variance explained in assigning the patients to their "ideal person" shape components. The hit rate for assigning the 458 patients to the components was 81.0%, and the percentage of variance which was explained was 65.6%.

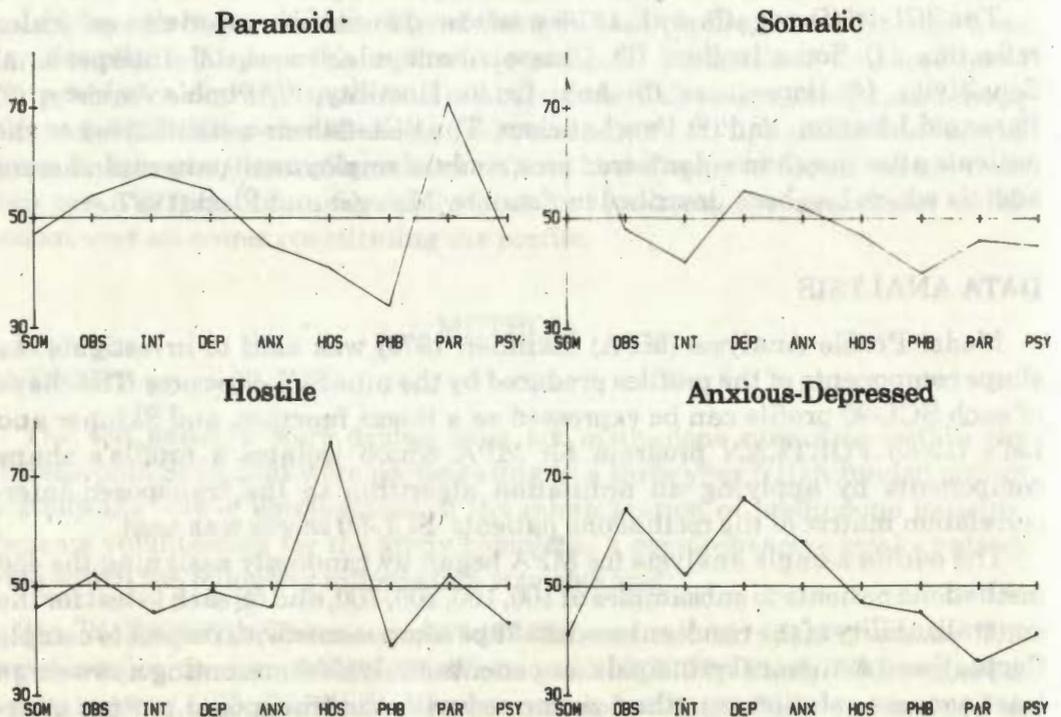


FIGURE 1. SCL-90 Modal Profiles

Table 1

## SCL-90 MODAL PROFILE SCORES

Shape	SOM	O-C	INT	DEP	ANX	HOS	PHOB	PAR	PSY
I. Paranoid	47	54	58	55	45	41	34	71	46
II. Somatic	75	48	42	55	52	47	40	46	45
III. Hostile	46	52	45	49	46	76	39	52	43
IV. Anxious-depressed	41	64	52	61	58	47	45	36	41

NOTE: -N = 458 Each scale has been scored to have a mean = 50, standard deviation = 10.

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Figure 1 presents the graphs of the four SCL-90 shapes. Shape I showed a predominantly high elevation for Paranoid Ideation and was considered to represent the Paranoid shape. Somatization was markedly displayed by Shape II (Somatic) with low Interpersonal Sensitivity. Shape III had elevations for Hostility and Paranoid Ideation and was called the Hostile type. Finally, Shape IV had elevations for Depression and Obsessive-compulsiveness with an average elevation for Anxiety; it was considered to represent an Anxious-depressed type.

### SIMILARITY

To determine whether or not the shapes were comparable to those previously reported by Steer (1982a) for seven ICD-9 disorders, Spearman rank-order correlations were calculated between the same-named shape components previously described for the ICD-9 disorders and the shape components found here. The correlations for the Paranoid, Somatic, Hostile, and Anxious-depressed shapes were .79, .75, .72, and .84, respectively. The first and last coefficients were significant beyond the .01 level, whereas the second and third coefficients were significant beyond the .05 level, one-tailed test. None of the correlations among the non-same named shape components was significant.

Table 2 presents the product moment correlations of the SCL-90 modal-profile components with the methadone patients' background and treatment characteristics. Fisher Z transformations were first applied to the four shape-component loadings. The frequency distributions, means, and standard deviations of the characteristics were presented above in describing the sample. As Table 2 indicates, the overall mean level of symptom distress was significantly associated with 12 out of the 25 variables, and the variability (scatter) of distress reported across the nine SCL-90 subscales was also significantly related to 13 out of the 25 variables. The Paranoid and Somatic shape components were each correlated with three characteristics; the Hostile shape component was associated with four characteristics; and the Anxious-depressed shape component was related to six characteristics.

### LEVEL

Overall symptom distress was associated with being female, younger, less educated, unemployed, using alcohol at an earlier age, using heroin and heroin at an earlier age, entering drug treatment at an earlier age, entering more than one drug treatment program, currently using illicit barbiturates, currently drinking alcohol, having been previously treated for alcoholism, and having current medical problems.

### SCATTER

Variability in symptom distress was associated with being female, being younger, being Black, using marijuana, alcohol, and heroin at earlier ages, realizing that one had a drug problem at an earlier age, entering treatment earlier, having entered more drug treatment programs, not having methadone take-home privileges, currently using barbiturates and marijuana, and having current medical problems.

Table 2

**CORRELATIONS OF THE SCL-90 MODAL PROFILE COMPONENTS  
WITH METHADONE PATIENTS' BACKGROUND  
AND TREATMENT RESPONSE CHARACTERISTICS**

Characteristic	Level	Component				Anxious-depressed
		Scatter	Paranoid	Somatic	Hostile	
<b>BACKGROUND</b>						
Sex (1 = Male, 2 = Female)	.12**	.10*	.03	.01	-.11*	.05
Age (yrs)	-.15**	-.19***	.04	.04	-.03	-.08
Race (0 = White, 1 = Black)	.08	.20***	-.03	.07	.07	.20***
Married (0 = No, 1 = Yes)	-.05	0	-.08	.01	.14**	-.10*
Education (yrs)	-.15**	-.05	.01	-.02	.02	0
Employed (0 = No, 1 = Yes)	-.11*	-.02	.08	-.04	.04	0
Age of 1st Marijuana Use (yrs)	-.09	-.10*	.17***	-.10*	-.10*	-.12*
Age of 1st Alcohol Use (yrs)	-.12*	-.16***	.05	0	-.06	-.07
Age of 1st Heroin Use (yrs)	-.10*	-.10*	.08	-.07	-.02	-.06
Age of Realization of Drug Problem (yrs)	-.09	-.11*	.07	-.02	-.07	-.14
Age of 1st Entering Drug Treatment (yrs)	-.18***	-.16***	.09	-.03	.04	-.11*
Number of Drug Treatments	.14**	-.11*	0	-.01	0	.02
Length of Attending Current Methadone Program (yrs)	-.06	-.02	.02	.02	-.03	.04
Methadone Dose (mg)	.04	.02	.01	-.02	.02	.02
Take Home Privileges (1 = Yes, 2 = No)	.12	.15**	-.01	-.04	-.02	.09
Heroin Use	.07	.07	.11*	-.08	.05	-.02
Cocaine Use	-.01	-.04	.11*	-.06	-.01	.01
Amphetamine Use	.01	.04	-.01	-.06	.17***	-.06
Barbiturate Use	.18**	.17***	-.04	-.04	.07	.06
Marijuana Use	.03	.12**	.06	-.05	.06	.06
Alcohol Use	.11	0	-.03	.01	.09	-.04
Number of Drug- Related Arrests	-.01	.04	-.02	.03	.05	.05
Court Ordered Treatment (1 = Yes, 2 = No)	.07	-.08	.02	.10*	.01	.04
Alcoholic Problems (1 = Yes, 2 = No)	-.14**	-.04	.04	.05	.01	-.01
Current Health Problems (1 = Yes, 2 = No)	-.22***	-.26	0	-.16***	.04	.11*

NOTE: -N = 458; \* p < .05; \*\* p < .01; \*\*\* p < .001

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### SHAPE

With regard to specific shapes, the Paranoid shape was associated with smoking marijuana at a later age and currently using both heroin and cocaine. The Somatic shape was related to earlier marijuana use, not being court mandated to methadone treatment, and having current medical problems. The Hostile shape was associated with being male, Black, using marijuana at an earlier age, and currently using amphetamines. Finally, the Anxious-depressed shape was associated with being Black, not married/cohabitating, using marijuana at an earlier age, realizing that one had a drug problem at an earlier age, entering drug treatment at an earlier age, and not having a current health problem.

### DISCUSSION

The overall pattern of results indicated that the SCL-90 scores for the methadone patients represented four distinct profile shapes. The types of symptom profiles were similar to four of the five previously described by Steer (1982a) when Modal Profile Analysis had been used to study seven ICD-9 mental disorders. The Phobic Depressed shape did not emerge with the methadone patients, and Steer's (1982a) 50 male and 50 female opioid users also did not reflect this profile. Only the patients with ICD-9 schizophrenia disorders loaded saliently on this shape component.

The four distinct shapes of psychopathology found for the methadone patients have implications for improving differential treatment by helping clinicians detect patients describing different types of symptom distress. For example, the identification of the Somatic profile by a somatic score above a T-score of 70 and the other eight scale scores hovering around T scores of 50 may reveal serious medical problems which should be evaluated by a thorough medical examination. The identification of an Anxious-depressed profile, on the other hand, might suggest a need for a psychiatric evaluation. Persons displaying the Anxious-depressed profile might be at a higher risk for committing suicide and successfully completing suicide because obsessive compulsive features were prominent in this profile for the methadone patients studied here. The presence of a Paranoid profile should alert staff that they will have to work hard to instill trust, and patients with Hostile shapes may have trouble adhering to a program's rules and procedures.

Further research should be undertaken to determine whether or not the four types of symptom profiles are related to program retention and eventual detoxification. Finally, the utility of the present classification scheme should be assessed with respect to therapeutic planning. For example, heroin patients with different SCL-90 profiles may respond differentially to high and low doses of methadone.

Elsewhere, it has been argued (Platt, 1986) that the addiction research and treatment field is in need of a means of classifying or "typologizing" clients as well as the treatment process. Such a typology would allow for the most efficacious matching of patients and treatments and could, hopefully, increase

understanding about addiction. This, in turn, could ultimately improve the rates of treatment success. The present study is a step towards developing a typology of symptom distress in methadone patients and may ultimately lead to a prescriptive treatment regimen.

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### FOOTNOTES

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2. Requests for reprints should be sent to the senior author at UMDNJ-SOM, 401 Haddon Avenue, Camden, New Jersey, 08103.