DEVELOPMENT OF A BRIEF, MULTIDIMENSIONAL, SELF-REPORT INSTRUMENT FOR TREATMENT OUTCOMES ASSESSMENT IN PSYCHIATRIC SETTINGS: PRELIMINARY FINDINGS

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Preliminary reliability and validity data are reported on a new, brief measure of psychiatric symptomatology. The Symptom Assessment-45 Questionnaire (SA-45) is a 45-item, patient self-report symptom inventory derived from the original Symptom Checklist-90-R (SCL-90), using cluster analytic methods. The SA-45 consists of nine 5-item scales assessing each of the same symptom domains as its parent instrument with no item overlap across domains. The vast majority of the internal consistency reliabilities for the SA-45’s nine scales were in the .70s and .80s across different age and patient status samples. As expected, both adolescent and adult patient samples generally differed significantly from nonpatient control samples, and patients at treatment follow-up differed significantly from patients at intake. Moreover, depressed patients with and without psychotic features differed significantly on three scales. A cluster analysis generally supported the nine-scale structure of the inventory, but it failed to consistently support the distinction between the Paranoid Ideation and Interpersonal Sensitivity scales. Limitations to the study are noted, but overall, the initial findings support the use of the SA-45 in clinical settings. Suggestions for needed future research are presented.

With the increasing need for efficient mental healthcare, there has been a trend toward the development and use of short, self-report instruments that minimize the need for healthcare workers’ time. Brief, multidimensional instruments that measure psychiatric status and can serve as both screening and outcome tools are in high demand. Ideal instruments should combine minimal respondent burden with high levels of reliability and validity. Only a few such assessment products are available from commercial publishers. One of the more popular multidimensional instruments is the Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982; Derogatis, 1992), which was derived from the Symptom Checklist-90-R (SCL-90-R; Derogatis, 1994). More recently,
work has been undertaken to develop an instrument that would be more cost effective than commercially available instruments, such as the BSI, and that would have at least equal utility for use in behavioral healthcare outcomes assessment programs.

The Symptom Assessment-45 Questionnaire (SA-45\(^1\); Strategic Advantage, 1996) was derived from the original, public domain Symptom Checklist-90 (SCL-90; Derogatis, Lipman, & Covi, 1973). Development was undertaken with the goal of developing from the SCL-90 an instrument that (a) retains the virtues of the parent instrument, (b) uses half as many items, (c) is composed of scales with equal length in order to maximize the likelihood of equal reliabilities, and (d) utilizes distinct scales having no item overlap across scales. Eliminating item overlap from an instrument, such as the SA-45, is important because it (a) minimizes the interscale correlations, thereby enhancing their discriminant validity; (b) ensures that any client population profile patterning is not a result of overlapping items; and (c) increases the research utility of the instrument by eliminating any correlation among scales due strictly to item overlap.

Developed primarily as a treatment outcome indicator, the 45 items of the SA-45 were drawn from the original SCL-90 item pool. The SCL-90 has its roots in the older Cornell Medical Index (Wider, 1948), but was developed directly from the Hopkins Symptom Checklist (HSC; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974; Lipman, Park, & Rickels, 1966). The SCL-90 was selected as the source of items for the SA-45 because it is a psychometrically sound instrument; it has been utilized with numerous populations as a tool for screening, assessing treatment outcomes, and other research purposes. It is suitable for both adolescents and adults (Derogatis & Lazarus, 1994), and there is strong evidence for the SCL-90's internal consistency, with subscale coefficient alphas ranging from .76 to .90 (Derogatis, Rickels, & Rock, 1976; Hafkenschiel, 1993; Mazmanian, Mendonca, Holden, & Dufton, 1987).

Studies also indicate that the SCL-90 item pool is useful in distinguishing diagnostic groups. For example, Clark and Friedman (1983) administered the SCL-90 to patients diagnosed with an anxiety disorder, depressive disorder, or schizophrenia. The analyses revealed that the three groups had very similar profile shapes across dimensions. However, there were intensity level differences. For example, the anxious patients scored higher on all of the scales than did the other two groups. Schizophrenic and depressed patients scored approximately the same across the scales. When scores were adjusted for individual mean intensity levels, only the Psychoticism scale was significantly different across diagnoses, with the anxious patients scoring higher than the other two groups.

In another investigation, Berlin, Ronthal, Bixler, and Kales (1983) examined SCL-90 scores in 105 individuals (43 men and 62 women) referred for neurological assessment. Depression was the most frequent symptom and pain was the most frequent complaint. Those complaining of pain scored higher on the Somatization and Depression scales than those who did not complain of pain.

The SCL-90 items also have been correlated with other measures used for mental health diagnosis. For example, Wetzler, Kahn, Strauman, and Dubro (1989) compared the SCL-90 Depression scale, the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1951) Depression scale, and the Millon Clinical Multiaxial Inventory (MCMI; Millon, 1982) Dysthymic scale. Their sample included 48 depressed patients and a comparison group of 68 patients with other psychiatric diagnoses. The depressed patients scored significantly higher on the SCL-90 Obsessive-Compulsive, Interpersonal Sensitivity, Depression, and Anxiety scales. Although the MMPI and MCMI had greater sensitivity and negative predictive power, the SCL-90 achieved the highest specificity, positive predictive power, and classification rates. Further data on the construct validity of the SCL-90 can be found in Derogatis, Lipman, Covi, and Rickels (1972) and Dining and Evans (1977).

This article reports early data on a new, short screening instrument. The purpose of this research was to provide the findings of several studies related to the development of a shortened  

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\(^1\)SA-45 is a trademark of Strategic Advantage.
version of the SCL-90 as well as the findings of
the initial investigations into the validity and reliabil
ity of this new instrument, the SA-45. The
development of the SA-45 is described in the first
study, whereas the second study is concerned with
the development of preliminary normative data
and the stability of its domain structure across
samples. Study 3 examines the validity of the SA-
45 through an investigation of differences
between nonpatient and patient samples as well as
between patient samples differentiated by diagno-
sis or treatment status. The internal consistency
of the SA-45 is examined in Study 4.

Study 1: Item Selection
In keeping with the increased need for efficient
instruments, the development of the SA-45 was
guided by specifications for a brief measure of
psychiatric symptomatology with the same
domains as the SCL-90, with an equal number of
items per domain, and with no item keyed to more
than one domain.

Studies of the SCL-90 factor structure (Clark &
Friedman, 1983; Derogatis & Cleary, 1977b;
Evenson, Holland, Mehta, & Yasin, 1980;
Hafkenscheid, 1993; Hoffman & Overall, 1978;
Holcumb, Adams, & Ponder, 1983; Lipman, Covi,
& Shapiro, 1979; Mazmanian et al., 1987; Shuty,
DeGood, & Schwartz, 1986; Strauman & Wetzler,
1992) further influenced the development of the
SA-45. Although there seemed little consistency
among these studies in terms of identifiable fac-
tors, two features were of particular note. First, a
depression factor often emerged as the dominant
dimension. Second, many of these studies sug-
gested solutions of fewer than the predicted nine
factors. In studies retaining nine or more factors,
some factors typically included only a few items.
This pattern suggested that if nine distinct symp-
tom domains on the SCL-90 exist, the domains
define a factor space of fewer than nine factors.
Therefore, cluster analysis rather than factor
analysis was selected for development purposes
because it seemed better suited to the recovery of
distinct item sets defining a small factor space. So
that items within a domain would form a distinct
cluster, items within a domain were selected to be
more highly correlated with each other than with
items from other domains.

Method

Participants
The participants for this study included both ado-
lescent and adult psychiatric patients receiving
either chemical dependency or other mental
health treatment in a nationwide network of inpa-
tient facilities operated by a major behavioral
healthcare corporation. These inpatient samples
consisted of 690 women, 829 men, 466 adolescent
girls, and 400 adolescent boys who agreed to par-
ticipate in an ongoing outcome assessment pro-
gram of which this study was part. The lower por-
tion of Table 1 (Intake Samples) contains a
description of these samples by age, gender, and
ethnic composition.

Instrumentation
The Symptom Checklist-90 is a 90-item checklist
of psychiatric symptoms that is frequently used for
psychiatric screening, treatment outcomes, and
other research purposes with adults and adoles-
cents. To each of the instrument's 90 items, the
respondent is asked, "How much were you bothe-
ered during the past 7 days including today by
[symptom]?” Clients respond on a 5-point scale
ranging from Not at all to Extremely. Eighty-three
of the 90 items are scored on one of the following
nine symptom domain scales: Anxiety, Depres-
sion, Hostility, Interpersonal Sensitivity, Obsessive-
Compulsive, Paranoid Ideation, Phobic Anxiety,
Psychoticism, and Somatization.

Procedure

Each participant was administered the SCL-90
along with a psychosocial survey instrument at the
time of admission for inpatient treatment. All
instruments were administered according to stan-
dardized procedures by the facility nursing staff as
part of the outcomes management program that
was in place throughout the provider organiza-
tion. Upon patient completion of other instru-
ments at the time of discharge (including the
SCL-90 again), all forms were submitted to the
healthcare organization's contracted provider of
### Table 1
Mean Age, Ethnic Composition, and Gender Composition of the Nonpatient and Intake Samples

<table>
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<th>Characteristic</th>
<th>Nonpatient samples</th>
<th>Intake samples</th>
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<tr>
<td>%</td>
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<tr>
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<tr>
<td>%</td>
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</tr>
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<tr>
<td>%</td>
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</tr>
<tr>
<td>%</td>
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</tbody>
</table>

(continued)
table 1 (continued)

Mean Age, Ethnic Composition, and Gender Composition of the Nonpatient and Intake Samples

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intake samples</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Adult female</td>
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<td>%</td>
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</tbody>
</table>

Note. The Other category includes missing, multiple ethnicity, and other responses. Adol. = adolescent.

treatment outcomes data analysis and reporting services.

Ward's (1963; Statsoft, 1995) cluster analytic method was selected for the purpose of this study. This method begins with each item as a distinct cluster. At the first step, the two most highly correlated items are combined into a cluster. At each succeeding step, the two most similar clusters are combined (one or both of which may be a single item), where similarity is the average correlation between items in the two clusters. A 9-cluster solution was retained in each analysis. For each domain, an initial set of SCL-90 items was chosen based on their having higher correlations with items in the same domain than with items in other domains. Based on cluster analyses and some trial and error, these initial item sets were adjusted in an attempt to arrive at a set of items within each domain that would form distinct clusters. Of the 45 items selected from the SCL-90, 35 also appear on the BSI.

Results

The horizontal axis of the tree diagram presented in Figure 1 labels each item selected for inclusion in the SA-45 by its domain and corresponding SCL-90 item number. Each horizontal line within the diagram corresponds to a link between two "clusters." Here, a cluster consists of a single item or a cluster of items formed at an earlier step in the analysis with the height of the link showing the dissimilarity between the clusters linked. For instance, the lowest link in Figure 1 is between Depression items 29 and 30, the two most highly correlated in the inventory.

If items form scales as expected, then the items for a scale would appear consecutively along the horizontal axis. For example, moving from left to right along the horizontal axis of Figure 1, the Hostility, Somatization, Depression, Obsessive-Compulsive, Anxiety, Phobic Anxiety, and Psychoticism items fully meet expectations. For Paranoid Ideation and Interpersonal Sensitivity, however, this distinct cluster criterion was not fully achieved. Along the horizontal axis, two Paranoid Ideation items (i.e., PAR43 and PAR76) are interspersed among the Interpersonal Sensitivity items, and, correspondingly, two Interpersonal Sensitivity items (i.e., INT37 and INT36) are interspersed among the Paranoid Ideation items.

Correlations between corresponding SCL-90 and SA-45 scales are generally in the 0.90s, with the exception of those for the Psychoticism scale for which the correlations are in the 0.80s in some samples. These correlations are undoubtedly inflated by the part-whole relationship between the two sets of scales.

Study 2: Preliminary SA-45 Normative Data

The identification of the 45 SCL-90 items that best assessed the nine symptom domains from the parent instrument was followed by an initial investigation into the need for separate sets of normative data for the clinical use of the SA-45. To be maximally useful, it was determined that, at a minimum,
it would be necessary to gather normative data based on both patient and nonpatient samples. This would extend the use of the instrument beyond treatment outcomes assessment to other types of clinical research as well as to screening for the presence of psychiatric disorders and other clinical activities.

Two general findings in the literature also influenced the investigation of the need for multiple normative data sets for the SA-45. First, various studies of mental health symptoms have found that females tend to report more symptoms than males (Allgood-Merten, Lewinsohn, & Hops, 1990; Eiser, Havermans, & Eiser, 1995; Inderbitzen & Hope, 1995; Newcomb & Bentler, 1987). Females may suffer from more symptoms, or females may be more likely to be aware of and to report their symptoms, or both. In either case, these gender differences suggest that it may be wise to report the psychometric properties of mental health symptom measures by gender.

The second trend influencing the investigation involved age differences, particularly differences between adolescents and adults. Age differences in mental health symptom levels and the factor structure of symptoms have been reported by Derogatis and Cleary (1977a), Eiser et al. (1995), and Inderbitzen and Hope (1995). Therefore, the analyses report data separately for adolescents and adults.

Method

Participants

Nonpatients

Four nonpatient samples, consisting of a total of 1,690 respondents, were recruited. These samples included employees of the nationwide behavioral healthcare corporation mentioned earlier and their adolescent children. In addition, approximately 300 adolescents from a Midwestern suburban high school agreed to participate in the study.