Path Analysis of the SCL-90-R: Exploring Use in Outpatient Assessment

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Abstract

The Symptom Checklist 90 Revised (SCL-90-R) is a widely used assessment of mental health pathology. Its factor structure has been called into question by numerous studies. This study assessed a community mental health outpatient sample \((n = 336)\) with the SCL-90-R and analyzed the factor structure. The results indicated that the SCL-90-R measures one large factor, but the test items held together reasonably well when a nine-factor extraction was executed. A shorter 67-item variant, which was a byproduct of this study, is hypothesized as having some key advantages over the original 90-item version. Implications for the assessment of the outpatient population with the SCL-90-R and its variants are discussed.

*Keywords:* factor analysis, SCL-90-R, outpatient, community mental health
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The Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 1994) has been a popular assessment for psychopathology in a variety of clinical settings, including psychiatric outpatient and inpatient. The 90-item self-report SCL-90-R was designed to measure nine distinct dimensions of psychopathology (Derogatis & Cleary, 1977a, 1977b). However, this purported nine-factor structure, the instrument’s general utility, and its usefulness as a diagnostic aid have been repeatedly challenged (Bonynge, 1993; Brophy, Norvel, & Kiluk, 1988; Cyr, McKenna-Foley, & Peacock, 1985; Pederson & Karterud, 2004; Rauter, Leonard, & Swett, 1996). The instrument’s predecessor, the SCL-90 (Derogatis, Lipman, & Covi, 1973), which like the SCL-90-R was designed to measure nine factors, has experienced similar questions, scrutiny, and evaluation to determine what mental health characteristics it actually captures (Hoffman & Overall, 1978).

The SCL-90-R is a 90-item self-report instrument designed to assess mental health symptoms across nine subscales generally associated with mental health pathology and three global scales (Derogatis, 1992). The nine subscales of the SCL-90-R include (a) Somatization, (b) Obsessive Compulsive, (c) Interpersonal Sensitivity, (d) Depression, (e) Anxiety, (f) Hostility, (g) Phobic Anxiety, (h) Paranoid Ideation, and (i) Psychoticism (Derogatis, 1992). The three global scales are the Global Severity Index (GSI), the Positive Symptom Distress Index (PSDI), and the Positive Symptom Total (PST; Derogatis, 1992). Respondents are asked to rate the severity of their symptoms on a scale of 0 to 4 (0, not at all; 1, a little bit; 2, moderate; 3, quite a bit; or 4, extreme; Derogatis, 1992). The instrument has been found to have high construct validity as well as high concurrent validity with similar instruments (Derogatis & Cleary, 1977a).
Statement of the Problem

Contemplating the number of studies challenging the factor structure and general utility of the SCL-90-R and this instrument’s widespread use and popularity in a variety of clinical settings, there appears to be a clear need to determine the true factor structure and utility of the SCL-90-R and to develop implications for this instrument’s use. A variety of studies have demonstrated that the factor structure of the SCL-90-R is not consistent with the original nine-dimension design and how a great deal of variance is explained by the first extracted factor.

Although a number of these studies have suggested areas in which and circumstances under which this instrument can be successfully deployed (e.g., brief screening instrument), few provide detailed information on how individual items and groups of items can be interpreted to maximize utility of the SCL-90-R. Additionally, there is a paucity of SCL-90-R research regarding assessment with community mental health outpatient samples and with those diagnosed with co-occurring disorders.

Numerous researchers have called for further experiments and analyses of the SCL-90-R characteristics, including the evaluation of specific populations, disorders, and research targeted toward the discriminatory properties of the subscales (Buckelew, Burk, Brownlee-Duffeck, Frank, & DeGood, 1988; Eich et al., 2003; Elliott et al., 2006; Gilliss, Moore, & Martinson, 1997; Kaplan et al., 1998; Recklitis, Licht, Ford, Oeffinger, & Diller, 2007). The research questions explored by the current study correspond to the calls for further research in other studies both broadly and in many specific facets. Recklitis et al. (2007) noted that using only one criterion measure in their study was a major limitation, whereas the current study uses several. The importance of identifying new subscales in the SCL-90-R is a key component of this study, which addresses the call for further research issued by Gilliss et al. (1997).
Buckelew et al. (1988) and Kaplan et al. (1998) stressed the importance of analyzing and interpreting the individual item responses of the SCL-90-R to aid clinicians in making accurate diagnoses. The study’s sample includes participants who suffer from severe pathology, including substance abuse, psychosis, personality disorders, and severe depression and anxiety. Elliott et al. (2006) noted the importance that future research use participants who suffer from severe mental health conditions, while Eich et al. (2003) cautioned that the SCL-90-R carries the risk of underestimating the prevalence of severe psychopathology.

The setting of this study allowed for the evaluation of participants with co-occurring disorders, which is a population that is only represented in a paucity of studies using SCL-90 or SCL-90-R and who could benefit from further research (e.g., Carpenter & Hitter, 1995; Zack, Toneatto, & Streiner, 1998).

The popularity of the SCL-90-R has been evident through the numerous and varied types of studies in which it has been featured. The instrument has been deployed to gain knowledge on topics that included effective outpatient screening (Holi, Marttunen, & Aalberg, 2003), mental health symptoms in substance abusers (Jansson, Hesse, & Fridell, 2008; Maremmani et al., 2010; Numan, 2004; Parrott, Milani, Parmar, & Turner, 2001), patients with psychopathological symptoms due to medical conditions (Kaplan et al., 1998; Siri et al., 2010; Torres et al., 2010), the instrument’s ability to distinguish between depressive and anxiety disorders (Kennedy, Morris, Pedley, & Schwab, 2001; Tomassini et al., 2009; Yong Woo et al., 2009), and the SCL-90-R’s reliability and validity in a multicultural context (Barker-Collo, 2003; Martinez, Stillerman, & Waldo, 2005). Other studies have examined the SCL-90-R in reference to assessing patients with panic disorder (Masdrakis, Papakostas, Vaidakis, Papageorgiou, &
Pehlivanidis, 2008), measuring the effectiveness of pharmacotherapy and psychotherapy combined on depression (Molenaar et al., 2007), evaluating the validity of other instruments (Recklitis et al., 2007), and measuring the effects of physical activity on depression (Ryan, 2008). Less researched areas of interest have also been studied with this instrument, including childhood abuse (Barker-Collo & Read, 2011), excessive Internet use (Chang-Kook, Byeong-Moo, Baity, Jeong-Hyeong, & Jin-Seok, 2005), participation patterns in research studies (Eich, 2003), adolescent inpatients (Hart, Bryer, & Martines, 1991), college students external locus of control (Holder & Levi, 1988), and inpatients who committed serious acts of violence (Bjørkly, 2002).

The SCL-90-R has been used in conjunction with other instruments—in some cases to evaluate the validity of other measurements (Chang-Kook et al., 2005; Recklitis et al., 2007). On a few occasions, researchers have assessed participants using one or more of the subscales of the SCL-90-R, but avoided using the entire instrument for their assessment. An interesting finding was this utility of the selective use of the subscales was often supported by the results (Holder & Levi, 1988; Ryan, 2008, Ruwaard et al., 2009). Underreporting or underestimating of severe pathology, the possible low discrimination value, and the possibility of flawed norms of the SCL-90-R has been reported (Bjørkly, 2002; Eich et al., 2003; Hart et al., 1991). Various mental health disorders have been assessed with the SCL-90-R including but not limited to (a) depression, (b) anxiety and panic, (c) personality disorders, (d) ADHD, (e) obsessive-compulsive disorders, and (f) dissociative disorders (Barkley, Murphy, & Kwasnik, 1996; Jannsson et al., 2008; Kennedy et al., 2001;
Kirkcaldy, Furnham, & Siefen, 2010; Masdrakis et al., 2008; Molenaar et al., 2007; Steinberg, Barry, Sholomskas, & Hall, 2005; Tomassini et al., 2009; Yong Woo et al., 2009).

**Short Versions**

Several abbreviated versions of the SCL-90-R have been developed and used in various studies and clinical settings (Hardt, Dragan, & Kappis, 2011; Kuhl et al., 2010). Some of the short versions of the SCL-90-R include the SCL-27, SCL-25, SCL-21, SCL-10, SCL-6, SCL-5, BSI-18, and BSI, all of which have demonstrated value for specific mental health assessment purposes (Asner-Self, Schreiber, & Marotta, 2006; Cepeda-Benito & Gleaves, 2000; Derogatis, 1993; Derogatis, 2000; Hardt & Gerbershagen, 2001; Piersma, Boes, & Reaume, 1994; Rosen et al., 2000; Strand, Dalgard, Tambs, & Rognerud, 2003; Tate, Kewman, & Maynard, 1990).

Neither the utility for the assessment of substance use nor the utility for the assessment of schizophrenia are discussed in the current study as they relate to the short versions of the SCL-90-R.

**Factor Structure and Utility**

Both the factor structure and the usefulness of the SCL-90 and SCL-90-R have been called into question by some studies (Pederson & Karterud, 2004; Rauter et al., 1996) yet supported by others (Evenson, Holland, Mehta, & Yasin, 1980). Although a substantial number of studies have supported a unidimensional factor structure for these instruments (Cyr et al., 1985; Zack et al., 1998), many studies have supported these instruments’ ability to discriminate between various mental health symptoms despite the presence of a factor structure that is incongruent with the original design specifications (e.g., Paap et al., 2011; Schmitz, Hartkamp, Kruse, et al., 2000).
Only with a firm understanding of the factor structure of this instrument will mental health professionals be able to make consistent, empirically based, and accurate decisions regarding client assessment with the SCL-90-R. This study addresses not only this pressing need in the mental health counseling community but also identifies a shorter and more precise variant of this instrument. The data used to identify this variant were gathered from a population that is underrepresented in research regarding the SCL-90-R. A detailed description of the factors extant in this variant as well as an explanation about how the factors relate to one another is provided for the benefit of mental health clinicians and clients they assess.

Discussion

The results of this study offer both support for and challenges to the factor structure of the SCL-90-R as defined by Derogatis (1992). Because only 83 items on the instrument are intended to be part of a scale, this study’s analyses focused mainly on these items. An exploratory factor analysis with 90 and 83 items each was performed using 90 and 83 items, which answered the first research question for this study—What is the factor structure of the SCL-90-R? This one factor appears to measure general mental health symptom severity, which supports the use of this instrument to assess clients for mental health symptomology, but challenges its usefulness to distinguish between the nine defined subscales. When the analysis was configured to extract exactly nine factors, a much different impression of the instrument was visible.