Factor structure analysis of the SCL-90-R in a community-based sample of African American women

Lloyd Kevin Chapman*, Jenny Petrie, Lauren Vines

Department of Psychological and Brain Sciences, University of Louisville, Louisville, KY 40292, USA

ABSTRACT

The empirical literature pertaining to anxiety and related disorders in African Americans continues to be sparse, raising significant doubt upon the valid assessment of anxiety and related disorders in African American samples. The identification of culturally valid instruments that accurately identify the symptomatology associated with anxiety and related constructs as well as differentiating individuals who meet criteria for anxiety and related disorders would undoubtedly enhance our understanding of anxiety and related constructs in diverse populations while assisting researchers in identifying ingredients for culturally sensitive therapies (CSTs). The current study represents a major stride in this area through examination of the factor structure of the Symptom Checklist 90-Revised (SCL-90-R) in a community-based sample of African American women. Ninety-one African American women completed the SCL-90-R as part of a larger investigation of anxiety and related disorders in African American parent–child dyads. Results suggest that psychological distress, as measured by the SCL-90-R, adequately fits the current data. Implications and suggestions for future work in this area are discussed.

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1. Introduction

Within the empirical literature pertaining to the anxiety disorder spectrum, a current vacuum exists in terms of the construct of anxiety within ethnic minority samples. In fact, the presentation of anxiety-related symptoms and the prevalence of anxiety disorders are still not fully understood within the context of certain minority groups, particularly African Americans (see Heurtin-Roberts et al., 1997; Smith et al., 1999; Chapman et al., 2009a, b; Chapman et al., 2011). However, the scant literature that does exist presents nascent evidence that African Americans in particular may have a higher rate of certain anxiety disorders (e.g., Post Traumatic Stress Disorder (PTSD) and specific phobias) than non-Hispanic White individuals (Nalven, 1970; Neal and Turner, 1991; Last and Perrin, 1993; Neal et al., 1993; Neal and Brown, 1994; Chapman et al., 2008; Chapman et al., 2011) while other symptom constructs may differ significantly from those found in Whites with the same disorder (e.g., specific phobia domains; see Chapman et al., 2008; Chapman et al., 2009a, b; Chapman et al., 2011). Research in this area with a focus on community-based ethnic minority samples would help amend the paucity of research germane to anxiety constructs in under-served populations.

It is well known that culture can affect the way in which diagnoses are conceptualized, and that certain universal symptoms of psychopathology may be grouped together to form culturally bound syndromes (Mezzich et al., 1999) unique to a particular group of individuals. What is less understood is the effect of culture on various assessment measures frequently used both in clinical practice and research settings to identify the presence and degree of symptoms of psychological distress. Previous research with self-report measures of personality constructs and psychopathology has found evidence that individuals who identify as African American frequently produce higher scores in certain areas of psychological distress than individuals who identify as non-Hispanic White. For example, early research with the Minnesota Multiphasic Personality Inventory (MMPI) found African Americans to produce higher scores than Whites on several scales measuring psychopathology (Greene, 1987; Graham, 1990). Additionally, biases have also been consistently indicated on the MMPI-2 in both inpatient and non-clinical samples of African American adults. For example, in two separate investigations that utilized the MMPI-2 to predict psychiatric diagnosis in African American inpatients, both Monnot et al. (2009) and Arbisi and Ben-Porath (2002) found both under and over prediction of psychiatric disorders. Similarly, in a sample of exclusively African American women, Reed et al. (1996) found that 76% of the sample had elevated scores on the MMPI-2 although the participants' coping scores were similar to normal controls. In response, some have suggested that separate ethnic group norms may be necessary for this measure, as the original normative sample lacked an adequate amount of African

American participants (Lindsey, 1998). However, more recent work in this area has utilized different measures of psychological distress in African American samples given the consistently found difficulties with the MMPI. For example, Chapman et al. (2009a, b), examined psychological distress, perceived control, and worry in a sample of African American and non-Hispanic White young adults. In the African American sample, worry was predicted by higher ratings of psychological distress as measured by the Beck Depression Inventory (BDI) and the State subscale of the State Trait Anxiety Inventory (STAI) while low perceived control was more predictive of worry in the non-Hispanic White sample. Additionally, recent research with self-report assessment measures focused on Obsessive Compulsive Disorder symptomatology has found that several of these measures may be racially biased towards African Americans, as this ethnic group appears to endorse higher amounts of items assessing for attitudes about cleanliness and contamination (Williams and Turkheimer, 2007). In terms of brief symptom checklists, little research has been conducted on the appropriateness of use of these measures with ethnic minority populations. Moreover, this ambiguity in the extant literature suggests the need for further examination a self-report measures of psychological distress for use in ethnic minority populations. As such, the current study represents advancement in this area through an attempt to examine the factor structure of the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994) in a community-based sample of African American adults. The goal of the study was to examine whether African Americans would produce the same SCL-90-R factor-loading pattern as the inventory's normative sample.

1.1. The symptom checklist-90-revised in African American adults

Since its development, the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994) has become one of the most commonly used measures of psychological assessment (Elliott et al., 2006) in clinical and research settings. The normative sample of nonpatients included 974 individuals, 49% ($n=480$) of which were female. Although less demographic information on the nonpatient normative sample is available, 11% ($n=111$) of the participants were identified as Black (Derogatis, 1994). The first and only study involving the SCL-90-R and an ethnic minority population attempted to assess the measure's ability to predict distress in African Americans (Ayalon and Young, 2007). Ayalon and Young found there to be few group differences between African American and White college students, and concluded that the SCL-90-R was a valid measure for use with an African American population. Aside from the work of Ayalon and Young, no studies to date have specifically measured the factor structure of the SCL-90-R using structural equation modeling in an exclusively African American sample. Ironically, existing work that examines factor patterns of anxiety and related constructs suggests variant factor patterns in African American as compared to non-Hispanic White adults (Chapman et al., 2008; Chapman et al., 2009a, b; Melka et al., 2010; Chapman et al., 2011). Furthermore, the current study should significantly add to work in this area by either confirming the work of Ayalon and Young (2007) or corroborating other work in this area suggesting variant factor patterns in psychological assessment measures in African American adults. As such, this study seeks to examine the factors structure of the SCL-90-R in a community sample of African American women.

2. Method

2.1. Participants

The current study was part of the "Cooperative for African American Family Excellence" (CAFÉ) Project, which examined anxiety and related disorders in African American families. The CAFÉ project was advertised as a "free, culturally sensitive familial assessment" and data was collected over the course of one year

(January–December 2010). Informed consent was obtained from all participants prior to taking part in the study, and they were paid $50 cash as an incentive for their time. Participants were 91 community dwelling African American females. Participants ranged in age from 23 to 55, with a mean age of 37 (S.D.=7.28). The majority of participants in the current study were single ($n=70$), although 23% were married at the time the study took place. The number of children that participants in the current study had ranged from one to seven, with a mean of approximately 2.5 children (S.D.=1.27). Ninety-three percent of the participants were high school graduates, although 62% of the sample earned less than $30,000 annually. Additionally, only 16% of the participants in the current study earned at least $50,000. All participants completed the Symptom-Checklist-90-Revised (SCL-90-R; Derogatis, 1994) individually in the Community and Family Excellence Research Lab at the University of Louisville in Louisville, Kentucky. To ensure data completeness, two Graduate Research Assistants checked all data prior to each participant's departure. Therefore, there was no missing data from the current study. Table 1 includes demographics for the current sample.

2.2. Model indicators

The responses from the SCL-90-R served as model indicators for the measurement model. A latent factor was created from the subscales of the SCL-90-R, which served as the measure of psychological distress in the measurement model.

2.3. The symptom checklist-90-Revised (SCL-90-R; Derogatis, 1994)

The Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994) is a multidimensional self-report symptom inventory originally designed for use in medical, clinical, and non-clinical samples and based on the Hopkins Symptom Checklist (Derogatis et al., 1974). The inventory is composed of 90 items, each a distinct symptom of psychopathology, which are rated on a Likert scale of 0 (none at all) to 4 (extremely) based on the amount of distress the symptom has caused the patient in the past seven days. Psychological distress is measured in terms of nine clinical subscales; Somatization (SOM), Obsessive-Compulsive (OBS), Interpersonal Sensitivity (INT), Depression (DEP), Anxiety (ANX), Hostility (HOS), Phobic Anxiety (PHO), Paranoid Ideation (PAR), and Psychoticism (PSY). Each symptom is rated on a five-point scale (0=not at all, 4=extremely) indicating how frequently the client has experienced these symptoms in

Table 1
Demographic characteristics of study sample, University of Louisville, 2010.

Variable	N	%	Confidence interval
Gender			
Female	91	100	
Age			
20–25	4	4	
26–30	15	16	
31–35	23	25	
36–40	24	26	
41–45	12	13	
46–50	7	8	
51–55	6	7	
Marital status			
Single	68	75	
Married	21	23	
Separated	2	2	
Number of children			
1	19	21	
2	33	36	
3	24	26	
4	8	9	
5+	7	8	
Education			
Grades 9, 10, or 11	6	7	
High school graduate	6	7	
Some college or specialized training	44	48	
College graduate	22	24	
Graduate or professional training	10	11	
Income level			
Under $10K	24	26	
$10,000–19,999	14	15	
$20,000–29,999	20	22	
$30,000–49,999	18	20	
$50,000–69,999	9	10	
$70,000+	6	7	

the last week. Multiple studies have found the SCL-90-R satisfactory in both its convergent and discriminant validity (Derogatis et al., 1976; Morgan et al., 1998). Table 2 contains the number of items on each subscale and examples of specific items on the SCL-90-R. Internal consistency for the SCL-90-R was high in the overall sample ($\alpha=0.98$). The internal consistencies for each of the nine dimensions are as follows: somatic ($\alpha=0.79$), Obsessive-Compulsive ($\alpha=0.90$), Interpersonal Sensitivity ($\alpha=0.91$), Depression ($\alpha=0.93$), Anxiety ($\alpha=0.79$), Hostility ($\alpha=0.85$), Phobic Anxiety ($\alpha=0.81$), Paranoid Ideation ($\alpha=0.83$), and Psychoticism ($\alpha=0.88$). The nine subscales from the SCL-90-R were subsequently utilized as model indicators for latent factor (e.g., psychological distress of the measurement model).

2.4. Approach to confirmatory factor analysis

A maximum-likelihood solution with an analysis of moment structure program (AMOS; SPSS, 2009) was used. The sample variance–covariance matrix was estimated using the latent variable (psychological distress from the nine subscales of the SCL-90-R). As suggested by Hoyle and Smith (1994), the psychological distress latent factor was created to decrease the likelihood of measurement unreliability while allowing for maximum flexibility, as well as the modeling of relations among constructs of interests. Global fit was measured by the chi-square goodness-of-fit test. Additionally, the generally accepted measures of global fit were utilized (e.g., the root mean square error of approximation (RMSEA); the incremental fit index (IFI); Bollen, 1989; the comparative fit index (CFI); Bentler, 1990). Acceptable fit values for the global fit indices are close to 1.0 (Hoyle and Smith, 1994; Hu and Bentler, 1999) with acceptable RMSEA cutoff values being close to 0.06 (Hu and Bentler, 1999). Measurement invariance (e.g., CFA) was tested with the psychological distress measurement model to determine whether the nine subscales on the SCL-90-R loaded on the psychological distress factor; constraints were employed following testing of measurement invariance. In terms of sample size, small sample sizes increase the probability of obtaining improper solutions and lack of model convergence while samples that are too large may inflate global fit indices. However, utilizing samples which are too large may lead to misleading indices of global fit. As such, it has been suggested that a sample size of 100 is adequate for accurate estimation of structural equation models (Anderson and Gerbing, 1984) while the current study is only estimating a measurement model for Confirmatory Factor Analysis (CFA) purposes. However, the most recent literature in this area presents a more compelling strategy to assess the adequacy of sample size for structural equation modeling. Along these lines, work by de Winters et al. (2009)

suggest utilizing a table for satisfactory factor recovery to determine the needed sample size for a given study. In using this approach, de Winters et al. (2009) identified the minimum sample size needed based on population conditions with a varying number of factors (e.g., 1–8), number of variables (e.g., 6–96) and strength of factor loadings (e.g., 0.2–0.9). Results indicated that even for models employing one factor with accompanying factor loadings being 0.8 or higher, that sample sizes as low as 10 were sufficient. Furthermore, the current study is assessing a measurement model in a sample of 91 participants and examining one latent factor with 8 of the 9 factor loadings exceeding 0.80 (Fig. 1). Along these lines, the current sample is more than adequate for the aforementioned statistical procedure.

3. Results

3.1. Means of SCL-90-R subscales

The means and standard deviation (raw scores) on the subscales on the SCL-90-R in the current sample as compared to those of the general population are shown in Table 2 and were as follows: Somatization subscale ($M=0.56$, S.D.$=0.77$), Obsessive Compulsive subscale ($M=0.64$, S.D.$=0.72$), Interpersonal Sensitivity subscale ($M=0.60$, S.D.$=0.81$), Depression subscale ($M=0.64$, S.D.$=0.79$), Anxiety subscale ($M=0.39$, S.D.$=0.64$), Hostility ($M=0.51$, S.D.$=0.71$), Phobic Anxiety subscale ($M=0.28$, S.D.$=0.53$), Paranoia subscale ($M=0.60$, S.D.$=0.79$), Psychoticism ($M=0.33$, S.D.$=0.60$). Sample items can be found in Table 3.

## 3.2. Bivariate correlations of model indicators

Bivariate correlations were conducted with the utilized model indicators and to examine the association between variables.

Table 2
Means and S.D. for current sample and general population.

Subscale	Current female sample, University of Louisville, 2010		Female nonpatient normative sample	
	Mean	S.D.	Mean	S.D.
Somatization	0.56	0.77	0.43	0.47
Obsessive compulsive	0.64	0.72	0.44	0.49
Interpersonal sensitivity	0.60	0.81	0.35	0.43
Depression	0.64	0.79	0.46	0.52
Anxiety	0.39	0.64	0.37	0.43
Hostility	0.51	0.71	0.33	0.42
Phobic anxiety	0.28	0.53	0.19	0.38
Paranoid ideation	0.60	0.79	0.34	0.46
Psychoticism	0.33	0.60	0.15	0.25

Table 3
Sample items from the SCL-9-R.

Subscale	Number of items on subscale	Items
Somatization	12	56. Feeling weak in parts of your body
Obsessive compulsive	10	38. Having to do things very slowly to ensure correctness
Interpersonal sensitivity	9	61. Feeling uneasy when people are watching or talking about you
Depression	13	30. Feeling blue
Anxiety	10	57. Feeling tense or keyed up
Hostility	6	24. Temper outbursts that you could not control
Phobic anxiety	7	47. Feeling afraid to travel on buses, subways or trains
Paranoid ideation	6	83. Feeling that people will take advantage of you if you let them
Psychoticism	10	62. Having thoughts that are not your own
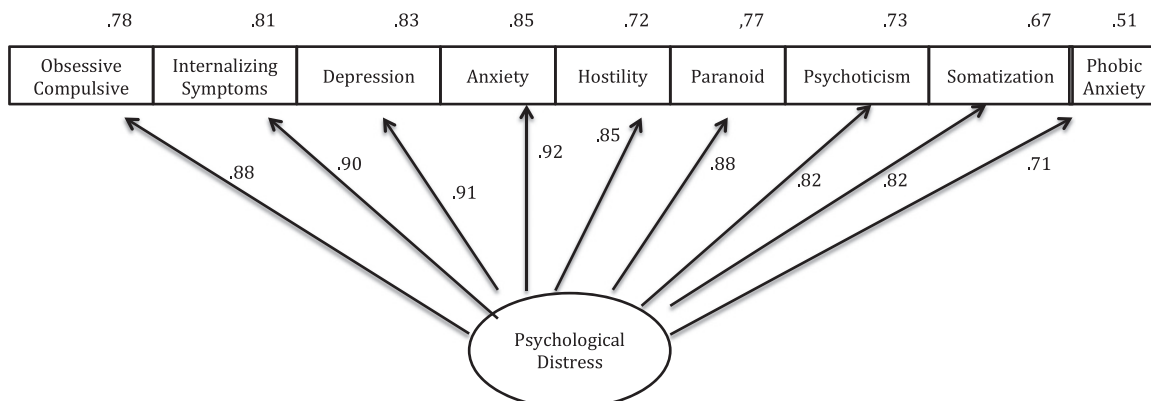
Fig. 1. Factor structure of the SCL-90-R in a community-based sample of African Americans.
Note. Values above the Indicators (rectangles) are multiple squared correlations; values accompanying arrows represent standardized regression weights.

Table 4
Bivariate correlations among model indicators in community-based sample of African American adults, University of Louisville, 2010.

Variables	1	2	3	4	5	6	7	8	9
1 Somatic anxiety	–	0.717**	0.612**	0.599**	0.708**	0.570**	0.594**	0.494**	0.546**
2 OC anxiety	–	–	0.765**	0.833**	0.718**	0.701**	0.528**	0.682**	0.708**
3 Interpersonal sensitivity	–	–	–	0.857**	0.766**	0.728**	0.766**	0.783**	0.749**
4 Depression	–	–	–	–	0.787**	0.810**	0.586**	0.797**	0.755**
5 Anxiety	–	–	–	–	–	0.753**	0.677**	0.664**	0.771**
6 Hostility	–	–	–	–	–	–	0.562**	0.706**	0.709**
7 Phobic anxiety	–	–	–	–	–	–	–	0.675**	0.730**
8 Paranoia	–	–	–	–	–	–	–	–	0.763**
9 Psychoticism	–	–	–	–	–	–	–	–	–

** $p < 0.01$.

The correlations are presented in Table 4. As expected, the model indicators utilized for psychological distress were all significantly correlated.

3.3. Confirmatory factor analysis of the SCL-90-R

Measurement invariance was tested by examining the measurement model of the latent construct of psychological distress. The results are presented in Fig. 1. The global fit indices for the nested model indicated excellent fit χ^2 (14, $N=100$)=21.4, $p=0.070$; CFI=0.98, IFI=0.98, RMSEA=0.070. These results suggest that psychological distress as measured by the SCL-90-R fits the data suggesting that the psychological distress factor as measured by the SCL-90-R appears to be adequate in the current sample comprised of African American women.

4. Discussion

The current investigation was conducted to examine the factor structure of the SCL-90-R in a community-based sample of African American women. Moreover, the current study presents several significant findings related to the appropriateness of the SCL-90-R for use with African American women. Most notably, the current study is one of the few to date to examine the factor structure of a well-known self-report instrument in an exclusively African American sample. Based on the results of the current study, results indicate that the SCL-90-R is an adequate measure for assessing psychological distress, specifically in community-dwelling African American women and, therefore, corroborate to an extent the aforementioned results by Ayalon and Young (2007). The resulting factor loading pattern in the current study, particularly with the phobic anxiety and somatization subscales, corroborate previous work in this area in African American samples (Nalven, 1970; Neal and Turner, 1991; Neal et al., 1993; Last and Perrin, 1993; Neal and Brown, 1994; Chapman et al., 2008; Chapman et al., 2011). Based on the current findings, one may presume that slight elevations on the SCL-90-R in African American women may indicate the need to further screen for the presence of anxiety and related concerns (e.g., t-scores in the 55 range). However, this interpretation appears to be tenuous given that other literature investigating psychological distress as measured by the SCL-90 does not generally support this notion.

The invariant factor pattern of the SCL-90-R in the current sample of African American women is promising for a number of reasons. First, previous work in this area has yielded inconsistent results for African American samples. Interestingly, the current study is the first to date to explicitly examine the factor structure of the SCL-90-R in a sample comprised exclusively of African American females. As such, psychological distress as measured by the SCL-90 appears to be a measure that should be included in future studies with African American females as a measure of distress. Examining the SCL-90-R in African American males still warrants further exploration. Second, factor-loading patterns in the current, African American female sample suggests comparable response patterns to non-Hispanic White samples. Given that the SCL-90 assesses psychological distress from several constructs endemic to anxiety, depression, and negative affectivity, results from the current study should provide clues for future researchers interested in specific subscales of the SCL-90 and concurrent validity. Additionally, results from the current study also suggest that the subscales contained on the SCL-90 potentially encompass facets of psychological distress that are endorsed by most individuals in the general population. As previously noted, anxiety, fear of specific objects, depression, bodily complaints, interpersonal sensitivity, and hostility are all symptoms that many individuals endorse to some extent. As such, the SCL-90 may be the best measure to date to reflect distress, at least in African American females and non-Hispanic White adults. This is promising since it reflects the need for future researchers to compare SCL-90 subscales with other measures of distress in African American females, non-Hispanic White adults, and other ethnic minority groups who are healthy controls as well as those diagnosed with psychiatric disorders.

In terms of limitations of the current study, the final sample was exclusively comprised of African American female participants, and as a result gender was not a feasible variable to be used during the analysis of the data. Future research on the factor structure of the SCL-90-R with a community based sample of African Americans should either attempt to replicate these results with a comparable sample of male participants, or with a more representative sample in terms of gender. An additional limitation worth noting is that the current sample was comprised of predominantly lower income African American adults. Generalizability of the current findings will be somewhat restricted due to other factors that may influence ethnicity and income, such as racial identity and acculturation. Efforts are currently under way to recruit African Americans who report middle and upper income levels. Although the sample size for the current study was adequate, a larger sample would have been more ideal and potentially strengthened the results from the current study, Moreover, a larger sample would have particularly affected the generalizability of the results. Future work in this area should target a larger sample of community-dwelling African American men and women. Additionally, obtaining diagnostic information on a relatively large African American sample could potentially enhance the findings from the current study. Again, current efforts are under way to obtain such data.

In light of the results of the current study, it is suggested that the SCL-90-R appears to be a sensitive measure for the assessment of psychological distress in African American women. Although promising, conclusions from the current study continue to emphasize the growing need for examining whether assessment measures

are culturally appropriate for African Americans and other ethnic minorities. As previously mentioned, the influence of culture on certain universal symptoms of psychopathology is both understood and recognized; in fact, Appendix I of the Diagnostic and Statistical Manual of Mental Disorder IV-TR (DSM-IV-TR) is entitled "Outline for Cultural Formulation and Glossary of Culture-Bound Syndromes," and contains several pages detailing various disorders unique to certain cultures around the globe (American Psychiatric Association, 2000). Unfortunately, there is still much work to be done in creating assessment measures of psychopathology, which are sensitive in their ability to accurately predict and identify universal symptoms of psychological distress within the context of unique cultural groups. Thus far, the SCL-90-R appears to be an adequate measure of psychological distress in African American females and should be further considered during assessment with this population.

References

Anderson, J.C., Gerbing, D.W., 1984. The effect of sampling error on convergence, improper solutions, and goodness of fit indices for maximum likelihood confirmatory factor analysis. Psychometrika 49, 155–173.

American Psychiatric Association, 2000. Diagnostic and statistical manual of mental disorders (fourth ed., text rev.). Washington, DC: Author.

Arbisi, P.A., Ben-Porath, Y.S., 2002. A comparison of MMPI-2 validity in African American and Caucasian psychiatric inpatients. Psychological Assessment 14 (1), 3–15.

Ayalon, L., Young, M.A., 2007. Using the SCL-90-R to assess distress in African Americans and Caucasian Americans. Journal of Black Studies 39 (3), 420–433.

Bentler, P., 1990. Comparative fit indexes in structural models. Psychological Bulletin 107 (2), 238–246.

Bollen, K.A., 1989. A new incremental fit index for general structural equation models. Sociological Methods Research 17, 303–316.

Chapman, L.K., Vines, L., Petrie, J., 2011. Fear factors: cross validation of specific phobia domains in a community-based sample of African American adults. Journal of Anxiety Disorders 25 (4), 539–544.

Chapman, L.K., Kertz, S.J., Zurlage, M.M., Woodruff-Borden, J., 2008. A confirmatory factor analysis of specific phobia domains in African American and Caucasian American young adults. Journal of Anxiety Disorders 22 (5), 763–771.

Chapman, L.K., Kertz, S.J., Woodruff-Borden, J., 2009a. A structural model analysis of psychological distress and perceived control on worry among African American and European American young adults. Journal of Anxiety Disorders 23, 69–76.

Chapman, L.K., Williams, S.R., Mast, B.T., Woodruff-Borden, J., 2009b. A confirmatory factor analysis of the Beck Anxiety Inventory in African American and European American young adults. Journal of Anxiety Disorders 23, 387–392.

de Winter, J.C.F., Dodou, D., Wieringa, P.A., 2009. Exploratory factor analysis with small sample sizes. Multivariate Behavioral Research 44, 147–181.

Derogatis, L.R., 1994. SCL-90-R: Symptom Checklist-90-R. NCS Pearson, Minnesota.

Derogatis, L.R., Lipman, R.S., Rickels, K., 1974. The Hopkins Symptom Checklist (HSCL): a measure of primary symptom dimensions. In: Pichot, P. (Ed.), Psychological measurements in psychopharmacology. Karger, Basel, pp. 79–110.

Derogatis, L.R., Rickels, K., Rock, A., 1976. The SCL-90 and the MMPI: A step in the validation of a new self-report scale. British Journal of Psychiatry 128, 280–289.

Elliott, R., Fox, C., Beltyukova, S., Stone, G., Gunderson, J., Zhang, X., 2006. Deconstructing therapy outcome measurement with Rasch analysis of a measure of general clinical distress: The Symptom Checklist-90-Revised. Psychological Assessment 18 (4), 359–372.

Graham, J.R., 1990. MMPI-2 Assessing Personality and Psychopathology. Oxford University Press, New York.

Greene, R.L., 1987. Ethnicity and MMPI performance: a review. Journal of Consulting and Clinical Psychology 55, 497–512.

Heurtin-Roberts, S., Snowden, L., Miller, L., 1997. Expressions of anxiety in African Americans: Ethnography and the epidemiological catchment area studies. Culture, Medicine, and Psychiatry 21, 337–363.

Hoyle, R., Smith, G., 1994. Formulating clinical research hypotheses as structural equation models: a conceptual overview. Journal of Consulting and Clinical Psychology 62 (3), 429–440.

Hu, L., Bentler, P., 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Structural Equation Modeling 6 (1), 1–55.

Last, C.G., Perrin, S., 1993. Anxiety disorders in African–American and Caucasian children. Journal of Abnormal Child Psychology 2 (2), 153–164.

Lindsey, M.L., 1998. Culturally competent assessment of African American clients. Journal of Personality Assessment 70, 43–53.

Melka, S.E., Lancaster, S.L., Adams, L.J., Howarth, E.A., Rodriguez, B.F., 2010. Social anxiety across ethnicity: A confirmatory factor analysis of the FNE and SAD. Journal of Anxiety Disorders 24, 680–685.

Mezzich, J.E., Kirmayer, L.J., Kleinman, A., Fabrega, H., Parron, D.L., Good, B.J., Lin, K.M., Manson, S.M., 1999. The place of culture in DSM-IV. The Journal of Nervous and Mental Disease 187 (8), 457–464.

Monnot, M.J., Quirk, S.W., Hoerger, M., Brewer, L., 2009. Racial bias in personality assessment: Using the MMPI-2 to predict psychiatric diagnoses of African American and Caucasian chemical dependent inpatients. Psychological Assessment 21 (2), 137–151.

Morgan, C.D., Wiederman, M.W., Magnus, R.D., 1998. Discriminant validity of the SCL-90 dimensions of anxiety and depression. Assessment 5, 197–201.

Nalven, F.B., 1970. Manifest specific phobias and worries of ghetto versus middle class suburban children. Psychological Reports 27, 285–286.

Neal, A.M., Brown, J.W., 1994. Specific phobias and anxiety disorders in African American children. In: Friedman, S. (Ed.), Anxiety Disorders in African Americans. Springer, New York, pp. 65–75.

Neal, A.M., Lilly, R.S., Zakis, S., 1993. What are African American children afraid of?: A preliminary study. Journal of Anxiety Disorders 7 (2), 129–139.

Neal, A.M., Turner, S.M., 1991. Anxiety disorders research with African Americans: current status. Psychological Bulletin 109 (3), 400–410.

Reed, M.K., Walker, B., Williams, G., McLeod, S., Jones, S., 1996. MMPI-2 patterns in African American women. Journal of Clinical Psychology 52 (4), 437–441.

Smith, L.C., Friedman, S., Nevid, J., 1999. Clinical and sociocultural differences in African American and European American patients with panic disorder and agoraphobia. The Journal of Nervous and Mental Disease 187 (9), 549–560.

Williams, M.T., Turkheimer, E., 2007. Identification and explanation of racial differences on contamination measures. Behavior Research and Therapy 45, 3041–3050.