

# Using the SCL-90-R to Assess Distress in African Americans and Caucasian Americans

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This study is the first to evaluate the appropriateness of the use of the Symptom Checklist-90-Revised (SCL-90-R) with African American college students. Two types of racial group differences on the SCL-90-R subscales are evaluated: (a) differences in symptom report for reasons unrelated to the severity of the subscale pathology and (b) differences in how the symptom is related to the subscale pathology. The sample consists of 70 African American and 66 Caucasian American students. On five items distributed across three subscales, there are group differences in how the symptom is related to the severity of the subscale, suggesting that the constructs of subscale pathology differ across groups. On one item, symptom severity differs across groups, for reasons unrelated to the severity of the specific subscale and, therefore, resulting in test bias. Findings support the use of the SCL-90-R with African American college students.

**Keywords:** *race; ethnicity; assessment; depression; anxiety; paranoia*

**D**istress is a universal experience. However, the context in which it is presented, its verbal report and physical manifestation, its interpretation, and one's response to it may all be influenced by cultural values, beliefs, and practices. Culture also affects the conceptualization of diagnostic systems and the classification of the symptoms into familiar culturally bound syndromes (Mezzich et al., 1999).

Despite the fact that psychiatric classification of symptoms is highly influenced by culture, cross-cultural research has focused primarily on the prevalence rates of psychiatric disorders and has paid less attention to variations in the symptomatology of distress. The assessment of group differences in the

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symptomatology of distress has the advantage of providing important information about the nature of distress and its report across different cultures. This information can inform the creation of future diagnostic categories. In addition, assessment of group differences in the symptomatology of distress can provide important information about test bias and guide the use of assessment instruments across different cultures.

Only a few studies have assessed the dimensions of distress in African Americans and Caucasian Americans using self-report symptom rating scales. Because of the scarcity of research on racial group differences in distress, the nature of group differences in the self-report of distress is not clear. Several authors have found that African Americans report lower levels of symptomatology (Platt, Steer, Ranieri, & Metzger, 1989; Roberts, 2000; Skilbeck, Frank, Yamamoto, & Evans, 1984). In contrast, Casper, Belanoff, and Offer (1996) found that, relative to Caucasian American students, African American students reported greater levels of fear from external situations. Hall, Bansal, and Lopez (1999) conducted a meta-analysis of 31 years of Minnesota Multiphasic Personality Inventory (MMPI)/MMPI-II research and reported that overall ethnic minority groups scored higher on some scales and lower on others. However, the overall report of psychopathology across different ethnic groups was comparable, and there were no substantial clinical or statistical differences between the two groups.

Research also suggests that African Americans tend to report depression in the form of somatic complaints, whereas Caucasian Americans tend to report depression in a more cognitive-affective form (Blazer, Landerman, Hays, Simonsick, & Saunders, 1998; Greko, Brikman, & Routh, 1996; Simon, Fleiss, Gurland, Stiller, & Sharpe, 1973). Ayalon and Young (2003) identified two types of group differences in depressive symptomatology on the Beck Depression Inventory (BDI): (a) group differences in how symptoms are related to total BDI score, which represent group differences in the construct of depression, and (b) group differences unrelated to total BDI score, represents measurement bias. Self-dislike was a stronger manifestation of depression for Caucasian Americans than for African Americans, and sleep disturbance, loss of appetite, and loss of libido were stronger manifestations of depression in African Americans. Unrelated to depression severity, African Americans reported less pessimism, dissatisfaction, self-blame, and suicidal ideation and more sense of punishment and weight change than Caucasian Americans. Similarly, using differential item functioning analysis, Iwata, Turner, and Lloyd (2002) found that African Americans tend to report more somatic symptoms than affective symptoms on the Center for Epidemiologic Studies Depression Scale.

Many demographic, social, historical, and cultural differences distinguish African Americans from Caucasian Americans in the United States and likely explain some of the group differences in symptom report. Relative to Caucasian Americans, African Americans are more likely to live in poverty, to be unemployed, to be less educated, and to be born in single-headed female families (U.S. Bureau of Census, 1990). African Americans also are more likely than Caucasian Americans to be exposed to violence, trauma (Bachman, 1994; Hien & Bukszpan, 1999), racism, and discrimination throughout their lives (Kessler & Neighbors, 1986; Thompson, 1996, 2002). Spirituality, religiosity, and informal support have a more prominent role among African Americans than among Caucasian Americans (Taylor, Ellison, Chatters, Levine, & Lincoln, 2000; Van Hook, 1999). In addition, research has shown that relative to Caucasian Americans, African Americans tend to use a more external attributional style to explain negative events in their lives (Galanos, Strauss, & Pieper, 1994; Hillman, Wood, & Sawilowsky, 1992).

As conceptualized by Young, Fogg, and Choi (2002), the report of a symptom can differ across groups for three reasons. Most obviously, one group may be more distressed than the other. However, it is difficult to draw this conclusion without first considering two other possibilities. First, the relationship of the symptom to distress can differ across groups. For example, guilt may be a stronger manifestation of depression in one group compared to the other. In this case, report of guilt would be a better predictor of depression in one group than the other. Second, one group may report greater symptom severity but for reasons other than the severity of the subscale pathology. For example, depressed women may cry more than depressed men. But this may be because women in general cry more than men, not because the relationship between crying and depression is different for men and women. This type of group differences results in test bias, because group differences in the total score are due to spurious differences in item score.<sup>1</sup>

The purpose of the present study was to compare the symptom reports of African Americans and Caucasian Americans, as assessed by the symptom items in the nine subscales of the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994): Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. The use of this measure is particularly relevant because it includes a wide range of symptoms across a variety of subscales. Identifying the two sources of group differences provides important information about the psychometric qualities of a measure as well as the nature of psychopathology.

## Method

### Participants

The original sample included 147 community college students in a large Midwestern city. The college has a high percentage of ethnic minorities (75%). Participants were recruited at the school cafeteria and during several psychology classes. Students at the college who were either African American or Caucasian American and agreed to complete the research questionnaires were included. Participants received an explanation of the study and signed a consent form. Participants received \$5 for completing the questionnaires. Two participants were excluded from analysis because of a large number of missing items. Both were Caucasian American. Nine additional participants were excluded from analysis because they were neither Caucasian American nor African American. The final sample consisted of 66 Caucasian American and 70 African American students.

### Measures

*Racial group membership.* Group membership was determined by self-report (1 = White, not Hispanic; 2 = Black, not Hispanic; 3 = Hispanic White; 4 = Hispanic Black; 5 = Native American; 6 = South Asian; 7 = Pacific Islander; 8 = East/Southeast Asian; 9 = mixed; 10 = other). Participants who were born in the United States and defined themselves as either Caucasian American or African American were eligible to participate in the study.

*Symptom severity.* This was assessed by the SCL-90-R (Derogatis, 1977, 1994), a 90-item 5-point scale self-report inventory that has nine subscales: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. The measure is designed to screen for a broad range of psychological problems. The reliability of all SCL-90-R subscales is satisfactory, and validation tests have documented a high degree of convergent and concurrent validity of the SCL-90-R subscales (Derogatis, 1994). To date, there is no research on the psychometric properties of the SCL-90-R with African Americans.

### Statistical Method

Matched moderated regression (MMR; Young et al., 2002) was employed to identify the two types of group differences in self-report of symptoms. This analysis was conducted for each of the nine SCL-90-R subscales and

for each of the subscale items separately. MMR employs a traditional moderated multiple regression approach (Pedhazur, 1997) to model the relationship between the score on a particular item (the dependent variable) and the subscale total score (the independent variable) for each group (the moderator). In addition, participants are individually matched on SCL-90-R subscale total score so that a group difference in how the item is related to the subscale pathology can be distinguished from a group difference that is due to factors other than the severity of the subscale pathology. As required for the data analysis of each SCL-90-R subscale, subsamples matched on subscale total score ( $\pm$  one point) were created. This resulted in nine subsamples of 45 to 59 pairs of African American and Caucasian American participants in the analyses. Because of the large number of regression analyses conducted, we used a conservative  $p$  value of  $p < .01$ .

The full regression model includes the following terms: (a) the overall intercept; (b) group, coded 0 (African Americans) or 1 (Caucasian Americans). This term represents a constant group difference regardless of subscale severity. This term will be referred to as the group intercept; (c) adjusted total SCL-90-R subscale score (ASCL), which is the total SCL-90-R subscale score not including the item being analyzed. Adjusting the total score avoids a spurious relationship of total subscale score with item severity. This term represents the average relationship across groups of item severity and subscale severity (i.e., the regression slope). This term will be referred to as the overall slope; (d) the interaction of group and ASCL, formed as the product of these two variables. This term represents a group difference in the relationship between item severity and subscale severity (i.e., the difference in regression slopes). This term will be referred to as the group slope. In summary, group differences in how the severity of a symptom is related to subscale severity are assessed by the group slope term and group differences in symptom severity that are unrelated to subscale severity (i.e., related to some other factor on which the groups differ) is assessed by the group intercept term.

The analysis proceeds by first testing the significance of the group slope term. A significant group slope indicates that the relationship of the symptom to depression severity is different for African Americans and Caucasian Americans. After obtaining a significant group slope, separate regressions are computed for each group to determine if the overall slope term is significantly greater than zero for each group (Pedhazur, 1997). In the case of a significant group slope, the analysis for this item is now complete. The group intercept term is not of interest because intercept differences cannot be interpreted in the context of slope differences.

If the group slope term is not significant, it is dropped from the regression model, and a new regression is run to evaluate the group intercept and overall slope terms. If one of these terms is not significant, it is dropped from the model, and the remaining term is evaluated. A significant group intercept term indicates a group difference in the severity of this symptom but for some reason other than subscale severity. If the group intercept term is not significant, then the symptom is manifested equivalently in Caucasian Americans and African Americans. If neither the group slope term nor the overall slope term is significant, then the symptom is not related to the subscale.

## **Results**

### **Characteristics of the Sample and the Measure**

Table 1 summarizes the demographic and clinical characteristics of the sample. There were no significant differences between African Americans and Caucasian Americans in age and gender. However, there was a significant difference in religious identification.

The Global Severity Index (GSI) of the SCL-90-R was used as a measure of overall distress level and was compared to the norms of psychiatric outpatients. The GSI is computed by summing all item scores and then dividing by the total number of valid responses. Results indicated a wide range of GSI scores, with 24.3% of the African American sample and as many as 30.0% of the Caucasian American sample having a GSI equal to or greater than the mean GSI reported for psychiatric outpatients.

Reliability (Cronbach's  $\alpha$ ) of SCL-90-R scales was high in both groups and ranged from .77 to .89 for African Americans (median = .86) and from .78 to .92 for Caucasian Americans (median = .85). This is relevant because it indicates similar internal consistencies of the subscales in both groups.

### **Group Differences in Symptomatology**

Five symptom items exhibited group slope differences (see Tables 2 and 3). These are group differences in how the symptom is related to subscale pathology.

On the Obsessive-Compulsive subscale, 2 out of 10 symptom items had significant group slope effects. Both symptoms were related to obsessive-compulsive pathology in both groups. However, "feeling blocked in getting things done" (Item 28) was more strongly associated with obsessive-compulsive pathology in Caucasian Americans and "having to do things very

**Table 1**  
**Demographic and Clinical Characteristics of the Sample**

| Variable                            | AA ( <i>n</i> = 70) | CA ( <i>n</i> = 66) | Differences    |
|-------------------------------------|---------------------|---------------------|----------------|
| Sex                                 |                     |                     | <i>ns</i>      |
| Male (frequency)                    | 27                  | 30                  |                |
| Age                                 |                     |                     | <i>ns</i>      |
| Mean                                | 23.53               | 22.52               |                |
| Range                               | 18 to 49            | 16 to 53            |                |
| Religious preference                |                     |                     | <i>p</i> < .01 |
| Catholic                            | 16                  | 21                  |                |
| Protestant                          | 26                  | 10                  |                |
| Jewish                              | 0                   | 1                   |                |
| Muslim                              | 4                   | 0                   |                |
| Buddhist                            | 0                   | 3                   |                |
| Jehovah's Witness                   | 3                   | 0                   |                |
| Spiritual not religious             | 7                   | 20                  |                |
| None                                | 14                  | 8                   |                |
| Other                               | 0                   | 3                   |                |
| SCL-90-R                            |                     |                     |                |
| Mean                                | 79.41               | 96.61               | <i>ns</i>      |
| Range                               | 0 to 263            | 0 to 269            |                |
| Somatization dimension              | 10.79               | 12.63               | <i>ns</i>      |
| Obsessive-compulsive dimension      | 10.50               | 12.89               | <i>ns</i>      |
| Interpersonal sensitivity dimension | 7.91                | 9.33                | <i>ns</i>      |
| Depression dimension                | 11.53               | 16.00               | <i>ns</i>      |
| Anxiety dimension                   | 7.15                | 10.32               | <i>ns</i>      |
| Hostility dimension                 | 6.65                | 6.96                | <i>ns</i>      |
| Phobic anxiety dimension            | 3.87                | 4.64                | <i>ns</i>      |
| Paranoid ideation dimension         | 6.82                | 7.07                | <i>ns</i>      |

Note: SCL-90-R = Symptom Checklist-90-Revised; AA = African American; CA = Caucasian American. Differences were evaluated using *t* tests and chi-square tests.

slowly to ensure correctness" (Item 38) was more strongly associated with obsessive-compulsive pathology in African Americans.

On the Phobic Anxiety subscale, two out of seven symptom items had significant group slope effects (Item 25, "feeling afraid to go out of your house alone"; Item 70, "feeling uneasy in crowds, such as shopping or at a movie"). Both symptoms were related to phobic anxiety in both groups. However, for both symptom items, the association with phobic anxiety was stronger for African Americans than for Caucasian Americans.

On the Somatization subscale, 1 out of 12 symptom items had a significant group slope effect. Report of "hot or cold spells" (Item 49) was related

Table 2  
Summary of Regression Results Predicting SCL-90-R Item Score

| Item                            | Overall Slope                                            |      |      | Group Intercept Effect |      |       | Group Slope Effect |      |       | R <sup>2</sup> |         |      |
|---------------------------------|----------------------------------------------------------|------|------|------------------------|------|-------|--------------------|------|-------|----------------|---------|------|
|                                 | B                                                        | SE B | β    | B                      | SE B | β     | B                  | SE B | β     |                |         |      |
| Significant Group Slope Effects |                                                          |      |      |                        |      |       |                    |      |       |                |         |      |
| Obsessive compulsive            |                                                          |      |      |                        |      |       |                    |      |       |                |         |      |
| 28                              | Feeling blocked in getting things done                   | .044 | .019 | .268*                  |      | -.499 | .318               |      | .080  | .027           | .501**  | .317 |
| 38                              | Having to do things very slowly to insure correctness    | .114 | .021 | .699**                 |      | .689  | .333               |      | .335* | .028           | -.586** | .247 |
| Phobic anxiety                  |                                                          |      |      |                        |      |       |                    |      |       |                |         |      |
| 25                              | Feeling afraid to go out of your house alone             | .169 | .019 | .935**                 |      | .154  | .130               |      | .103  | .025           | -.535** | .455 |
| 70                              | Feeling uneasy in crowds, such as shopping or at a movie | .261 | .025 | .982**                 |      | .141  | .160               |      | .069  | .034           | -.445** | .551 |
| Somatization                    |                                                          |      |      |                        |      |       |                    |      |       |                |         |      |
| 49                              | Hot or cold spells                                       | .589 | .018 | .362**                 |      | -.494 | .281               |      | -.236 | .026           | .515**  | .458 |

Note: SCL-90-R = Symptom Checklist-90-Revised.  
\* $p < .05$ . \*\* $p < .01$ .

**Table 3**  
**Summary of Regression Results for Each Group Separately for**  
**Items With a Significant Group Slope Effect**

| Item                                                                  | Group            |             |         |                       |                    |             |         |                       |
|-----------------------------------------------------------------------|------------------|-------------|---------|-----------------------|--------------------|-------------|---------|-----------------------|
|                                                                       | African American |             |         |                       | Caucasian American |             |         |                       |
|                                                                       | <i>B</i>         | <i>SE B</i> | $\beta$ | <i>R</i> <sup>2</sup> | <i>B</i>           | <i>SE B</i> | $\beta$ | <i>R</i> <sup>2</sup> |
| Obsessive compulsive                                                  |                  |             |         |                       |                    |             |         |                       |
| 28 Feeling blocked in getting things done (CA > AA)                   | .044             | .019        | .315*   | .099                  | .126               | .020        | .664**  | .441                  |
| 38 Having to do things very slowly to insure correctness (AA > CA)    | .114             | .021        | .611**  | .374                  | .026               | .019        | .191    | .037                  |
| Phobic anxiety                                                        |                  |             |         |                       |                    |             |         |                       |
| 25 Feeling afraid to go out of your house alone (AA > CA)             | .169             | .020        | .742**  | .551                  | .054               | .015        | .423**  | .179                  |
| 70 Feeling uneasy in crowds, such as shopping or at a movie (AA > CA) | .261             | .027        | .793**  | .629                  | .121               | .021        | .606**  | .367                  |
| Somatization                                                          |                  |             |         |                       |                    |             |         |                       |
| 49 Hot or cold spells (CA > AA)                                       | .058             | .016        | .488**  | .238                  | .147               | .021        | .736**  | .542                  |

SCL-90-R = Symptom Checklist-90-Revised; AA = African American; CA = Caucasian American.

\* $p < .05$ . \*\* $p < .01$ .

to somatization in both groups but was more strongly associated with somatization for Caucasian Americans than for African Americans. No group slope effects were found on any of the other SCL-90-R subscales.

One item exhibited group intercept differences (Table 4). These are group differences in symptom level unrelated to subscale pathology. On the Paranoid Ideation subscale, one out of six symptom items had a significant group intercept effect. Unrelated to overall severity of paranoia, African Americans reported "feeling that most people cannot be trusted" (Item 18) more than Caucasian Americans. No significant group intercept differences were found on any of the other subscales.

**Table 4**  
**Summary of Regression Results Predicting**  
**SCL-90-R Item Score**

| Item                                                    | Overall Slope |             |         | Group Intercept Effect |             |         |                       |
|---------------------------------------------------------|---------------|-------------|---------|------------------------|-------------|---------|-----------------------|
|                                                         | <i>B</i>      | <i>SE B</i> | $\beta$ | <i>B</i>               | <i>SE B</i> | $\beta$ | <i>R</i> <sup>2</sup> |
| Significant group intercept effects                     |               |             |         |                        |             |         |                       |
| Paranoid ideation                                       |               |             |         |                        |             |         |                       |
| 18 Feeling that most people cannot be trusted (AA > CA) | .155          | .025        | .505**  | -.562                  | .207        | -.221** | .288                  |

Note: SCL-90-R = Symptom Checklist-90-Revised; AA = African American; CA = Caucasian American.

\* $p < .05$ . \*\* $p < .01$ .

## Discussion

Overall, our findings indicate that there are few group differences between African Americans and Caucasian Americans on the SCL-90-R. Given that this measure is so frequently used for research and screening purposes, these findings are reassuring and suggest that the use of the SCL-90-R with African American college students is justified. Results indicate that the constructs of psychopathology are similar in both groups and that there is almost no test bias in the use of the SCL-90-R with African American college students.

African Americans and Caucasian Americans differed regarding how symptoms are related to the type of pathology they assess (group slope effects) on five symptoms distributed across three SCL-90-R subscales. Two of these symptoms were on the Phobic Anxiety subscale. This subscale showed the most notable group differences (two out of seven scale items), suggesting that the nature of phobic anxiety (as assessed by the SCL-90-R) is somewhat different in the two groups. Distress associated with external circumstances (i.e., "fear of going out of the house alone," "uneasiness in crowds") was more strongly associated with phobic anxiety in African Americans. These findings are similar to those of Casper et al. (1996), who found that relative to Caucasian Americans, African Americans reported great fear of external situations. However, our findings also are different from Casper et al. because we suggest that phobic anxiety is expressed

more strongly as fear of external situations in African Americans relative to Caucasian Americans. Lifetime exposure to violent crimes, traumas (Bachman, 1994; Hien & Bukszpan, 1999), racism, and discrimination is greater for African Americans than for Caucasian Americans (Kessler & Neighbors, 1986; Thompson, 1996, 2002) and may explain the external nature of fear in African Americans.

Only one item exhibited a group difference that is unrelated to subscale pathology (i.e., a group-intercept effect). African Americans were more likely to report "distrust in people" than were Caucasian Americans. This particular item is likely to result in test bias because the present study suggests that African Americans are more likely to endorse distrust in people, unrelated to their overall level of paranoia. Clinicians and researchers should be aware of this tendency, which likely manifests not only on self-report measures but also behaviorally in clinical interviews. This finding is in accordance with Grier and Cobbs (1968), who coined the term *cultural paranoia* to account for the adaptive nature of distrust in African Americans. Similarly, Roberts (2000) has argued that because of the lifetime exposure to violence, trauma, and poverty, psychopathology in African Americans is highly influenced by external circumstances.

Contrary to expectation, the present study does not support previous research that found that African Americans report somatic symptoms of depression and Caucasian Americans report cognitive symptoms (Ayalon & Young, 2003; Blazer et al., 1998; Simon et al., 1973; Weissman, Bruce, Leaf, Florion, & Holzer, 1991). Possibly, this is because the SCL-90-R Depression subscale contains fewer somatic symptoms.

The present study has several limitations. Participants were community college students and therefore shared a similar level of education. However, level of education is a crude measure of socioeconomic status, especially among ethnic minorities. A more comprehensive assessment of socioeconomic status is likely to provide more useful information about the role of socioeconomic status in symptom report. In addition, the present study assessed symptom report of distress in a nonclinical population. Possibly, the nature of distress in a clinical population is different. The disadvantage of using a clinically diagnosed sample, however, is that the range of symptoms in such a sample is limited because the sample is already likely to meet specific diagnostic criteria. Future research will benefit from studying both clinical and nonclinical samples.

## Conclusion

A major advantage of the present study is the evaluation of group differences in self-report of a wide range of distress symptoms. Studying such a wide range of symptoms provides important information about the nature of distress in the two groups that is not limited to specific diagnostic categories. Another strength of the present study is the use of a methodology that provides information about group differences that are unrelated to overall subscale pathology and therefore represent test bias and group differences that are related to subscale pathology and therefore represent differences in the nature of the construct in the two groups.

In conclusion, this is the first study to evaluate the use of the SCL-90-R with African Americans. The study suggests that the SCL-90-R is a valid measure for use with African Americans. Only 1 item out of the 90 symptom items assessed represented test bias. Although this is not likely to significantly affect the total subscale score, researchers and clinicians should be aware that "distrust in others" is a poor indicator of paranoia in African Americans because of its high rate of endorsement in this group. On three subscales, the construct of psychopathology manifested somewhat differently across the two groups. However, a substantial group difference, supported by previous research, was evident only for the Phobic Anxiety subscale, suggesting that relative to Caucasian Americans, the nature of phobic anxiety in African Americans is more likely to be attributed to external circumstances. Because of this finding, it is important to assess both external and internal circumstances related to phobic anxiety in research and clinical work with African Americans.

## Note

1. Although some authors refer to a variety of psychometric problems as scale bias, we will use the term *bias* only to refer to systematic mean group differences that are unrelated to the construct being measured.

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