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# Psychometric Properties of the Center for Epidemiologic Studies Depression Scale in African-American and Black Caribbean Adults

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## Abstract

A 12-item version of the 20-item Center for Epidemiological Studies-Depression (CESD) Scales was not validated in Black U.S. adults but demonstrated strong psychometrics in other populations. Using data from the National Survey of American Life (n=4,815), the psychometric properties of the scale were tested in African-American and Black Caribbean adults. When compared with the DSM-IV-TR criteria for Major Depressive Disorder and Dysthymia, most items focus on depressed mood, providing evidence for content validity. Construct validity was questionable in African-American and Black Caribbean men. The CESD scores of African-American men who met the DSM-IV-TR criteria for Dysthymia were not significantly different than African-American men who did not ($t$=1.9, p=.109). The CESD scores of Black-Caribbean men who met the DSM-IV-TR criteria for MDD were not significantly different than Black-Caribbean men who did not ($t$=1.6, p=.198), and none of the Black-Caribbean men met the DSM-IV-TR criteria for Dysthymia. All groups had item-to-total correlations and inter-item correlations below 0.30 with the item “I felt like everything I did was an effort”. African-American and Black Caribbean men also had item-to-total correlations and inter-item correlations below 0.30 with the item “I felt that I was just as good as other people”. After eliminating these items, the alpha for the remaining 11 items was 0.80 and 0.76 in African-American and Black Caribbean women respectively. The alpha for the remaining 10 items was 0.73 in African-American and Black Caribbean men. The cut-off score was nine for the 11-item CESD and eight for the 10-item CESD.

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A report of the Surgeon General revealed Blacks are underrepresented in mental health research (U.S. Department of Health & Human Services [USDHHS], 2001). When Blacks are included, studies rarely take into account the different cultural backgrounds within the Black population. Individuals in the U.S. who self-identify as Black historically trace their roots to African slaves brought to the country involuntarily during the 1700s (Kent, 2007) and are now referred to as African-Americans. New laws sparked renewed immigration from the Caribbean and Africa, with the population of foreign-born individuals living in the U.S. who self-identify as Black rising nearly seven fold between 1960 and 1980, and more than tripling between 1980 and 2005 (Kent, 2007). These individuals come from a variety of backgrounds and are increasing at varying rates; between 1980-2005 the number of Jamaicans more than doubled, the number of Haitians nearly quadrupled, and the number of Ethiopians in 2005 was 13 times the 1960 number (Kent, 2007). Immigrants who self-

identify as Black have more education, higher incomes, and are less likely to be in poverty or unemployed than U.S. born African-Americans, but are often overqualified and underpaid for the jobs they have (Kent, 2007). This diversity in the Black U.S. population due to varying cultures and experiences may influence their mental health differently (U.S. Department of Health & Human Services [USDHHS], 2001). For example, the lifetime prevalence of Major Depressive Disorder (MDD) in U.S. adults of Caribbean ancestry who self-identify as Black was estimated at 13%, compared to 10% in U.S. adults without Caribbean ancestry who self-identify as Black (D. R. Williams et al., 2007). Because of the relatively recent dramatic increase in numbers of foreign-born individuals living in the U.S. who self-identify as Black and their differences from African-Americans, there is a need for culturally sensitive instruments in this population.

The National Survey of American Life (NSAL) was designed to explore intra-and inter-group racial and ethnic differences in mental disorders, psychological distress and informal and formal service use, as they are manifested in the context of a variety of stressors, risk and resilient factors, and coping resources, among a nationally representative sample of African-American and Black Caribbean adults (Jackson et al., 2004). The NSAL was conducted by the Program for Research on Black Americans within the Institute for Social Research at the University of Michigan (Jackson et al., 2004). The NSAL is a publicly available dataset housed within the Inter-University Consortium for Political and Social Research at the University of Michigan.

This author was not involved in the conceptualization and data-collection of the NSAL, but performed a secondary analysis of the NSAL examining the relationship between physical activity and depressive symptoms in Black U.S. adults. A systematic literature review found no firm conclusions could be drawn concerning the effects of physical activity on depressive symptoms in Black U.S. adults, partly due to convenience sampling, mostly female samples, and no account for the differences within the Black U.S. population (Torres, Sampselle, Gretebeck, Ronis, & Neighbors, 2010). The few studies that did examine the relationship between depressive symptoms and physical activity measured depressive symptoms with the 20-item Center for Epidemiologic Studies Depression (CESD) Scale. The NSAL measured depressive symptoms with 12 items from the original 20-item CESD (Radloff, 1977). The NSAL comprised a nationally representative sample with face-to-face interviews lasting on average 2 hours and 20 minutes (Pennell et al., 2004), necessitating a short and inexpensive measurement of depressive symptoms. The CESD in the NSAL includes 12 items from the longer well-validated 20-item CESD (Radloff, 1977). Therefore, this author undertook a psychometric evaluation of the 12-item CESD in the NSAL for the purposes of studying the relationship between depressive symptoms and other variables in a nationally representative sample of African American and Black Caribbean adults living in the U.S.

The CESD Scale is a self-report screening tool for depressive symptoms developed for epidemiologic studies by the National Institute of Mental Health (Radloff, 1977). The CESD was not intended as a clinical diagnostic tool and group averages should be interpreted in terms of level of depressive symptoms (Radloff, 1977). The CESD was designed to identify high-risk groups and study the relationship between depressive symptoms and other variables (Radloff, 1977). The CESD demonstrated reliability and validity in a wide range of

settings among diverse adult Black samples. The original CESD demonstrated high internal consistency (above 0.80), excellent concurrent validity (high correlation with other self-report depression scales) and strong evidence for construct validity (through confirmatory factor analyses) in Black English-speaking U.S. adult populations of both sexes with a wide range of age and socioeconomic status for an epidemiological study of depressive symptoms (Radloff, 1977). In specialized populations, the alpha ranged from 0.77 in a HIV high-risk social environment (Morrison, DiClemente, Wingood, & Collins, 1998) to 0.96 in young adults (Areán & Miranda, 1997) and caregivers (Knight, Silverstein, McCallum, & Fox, 2000). Significant positive correlations were found between the CESD and the Profile of Mood States (POMS)-Short Form ($r = 0.78$, $p < .0001$), POMS Depression Subscale ($r = 0.80$, $p < .0001$) and the Bradburn Negative Affect Scale ($r = 0.74$, $p < .0001$) in cancer survivors (Conerly, Baker, Dye, Douglas, & Zabora, 2002), providing evidence for convergent validity. The correlation of the CESD with the Bradburn Positive Affect scale was negative in cancer survivors ($r = -0.49$, $p < .0001$) (Conerly et al., 2002), suggesting discriminant validity. Confirmatory factor analyses have consistently found the same four factor model in African-Americans (Nguyen, Kitner Triolo, Evans, & Zonderman, 2004), Black U.S. women (Makambi, Williams, Taylor, Rosenberg, & Adams Campbell, 2009; C. Williams et al., 2007) and Black caregivers of individuals with dementia (Flynn Longmire & Knight, 2010; Roth, Ackerman, Okonkwo, & Burgio, 2008). The sensitivity of the CESD in the identification of depressive symptoms in psychiatric patients was 71% compared to depressive disorders confirmed with the Structured Clinical Interview for DSM-III-R (Baker, Velli, Friedman, & Wiley, 1995). However, only one recent study addressed the varying cultural backgrounds of Black adults, specifically Black settlers living in Nova Scotia from the U.S., Jamaica and other immigrants from the Caribbean, with an alpha of 0.89 (Etowa, Keddy, Egbeyemi, & Eghan, 2007).

The 12-item CESD in the NSAL is identical to the 12-item CESD used by Roberts et al. (1992). The correlation between the 12-item CESD and 20-item versions was 0.96 in a nationally representative sample of Black adolescents (Roberts & Sobhan, 1992). The optimal score was 16 in screening for clinical depression, yielding a sensitivity of 75.5 and specificity of 80.7, which compares favorably with the 20-item CESD (Roberts & Sobhan, 1992). For the sample of 12-17 years of age, alpha reliabilities were 0.64 for Blacks (Roberts & Sobhan, 1992). However, this 12-item CESD (Roberts & Sobhan, 1992) has not been validated in African-American and Black Caribbean adults. This study examines the psychometric properties of the 12-item CESD (Roberts & Sobhan, 1992) in a nationally representative sample of community-dwelling African-American and Black Caribbean adults in the NSAL (CESD-12-NSAL) for the purposes of studying the relationship between depressive symptoms and other variables.

## Method

### Participants

Interviewing started in early 2001 and was completed in the spring of 2003. The sample and sampling method is extensively described in Heeringa et al. (2004) and is briefly summarized here. Inclusion criteria in the NSAL incorporated U.S. adults in the two target

groups who were age 18 and older with no upper age limit, resided in households located in the contiguous 48 states, were able to complete the interview in English and consented to participate in the study (Heeringa et al., 2004). The African-American survey population included only Black adults who did not identify ancestral ties in the Caribbean, while the Caribbean Black survey population was limited to Black adults who self-identified as being of Caribbean ancestry (Heeringa et al., 2004).

## Procedure

A four stage national area probability sampling with special supplement for Caribbean Black adults was performed (Heeringa et al., 2004). Primary stage sampling comprised a stratified probability sample of U.S. households with two domains based on the 1990 census proportions of African-American households: The first stage included all census block households in which 10% or more of 1990 census households were reported to be African-American; second stage included all census block groups in which the 1990 census reported <10% density for African-American households; third stage included a systematic random sample of housing units which were contacted in person by an interviewer; if the interviewer reported that one or more eligible adults lived at the sample housing unit address, the interviewer prepared a complete list of household members and proceeded to randomly select a respondent for the study interview, comprising the fourth stage (Heeringa et al., 2004). Once a respondent was randomly selected from a sequential listing of eligible household members, no substitutions were allowed (Pennell et al., 2004). Supplemental sampling was restricted to census geographic areas that exceeded a minimum population density for Caribbean Blacks (Heeringa et al., 2004). Pretesting of questionnaires and training of interviewers was described extensively in Pennell et al. Oral consent was obtained prior to initiating the interview (Pennell et al., 2004). There was race/ethnic matching of interviewers and respondents (Pennell et al., 2004). The response rate was 70.7% for the African American and 77.7% for the Caribbean Black sample (Jackson et al., 2004). Black individuals missing values on the dependent variable depressive symptoms (23) or the Diagnostic and Statistical Manual 4$^{th}$ edition (DSM-IV-TR) criteria for major depressive disorder or dysthymia (292) were excluded from the current analysis, resulting in a sample size of 4,815. Institutional Review Board (IRB) approval at the University of Michigan was granted for the NSAL (Pennell et al., 2004) and the current study.

## Measures

The CESD Scale is a self-report scale developed for epidemiologic studies by the National Institute of Mental Health (Radloff, 1977). The original 20-item CESD was reduced to 12 items (Roberts & Sobhan, 1992) that are identical to the items used in the NSAL. For purposes of this paper, the 12 item version used in the NSAL will be referred to as the CESD-12-NSAL. The CESD-12-NSAL scale included items in sentence form such as “I had crying spells” and “I enjoyed life.” Responses were rated on a four point rating scale according to the amount of time the respondent felt like this during the past week, from (0) rarely or none of the time (less than one day), (1) some or a little of the time (1-2 days), (2) occasionally or a moderate amount of the time (3-4 days), and (3) most or all of the time (5-7 days). The total score was obtained through a possible range from 0 to 36, with higher scores indicating more symptoms (Radloff, 1977).

The DSM-IV-TR criteria for Major Depressive Disorder (MDD) and Dysthymia were obtained in the NSAL by using a modified version of the World Health Organization's (WHO) expanded version of the Composite International Diagnostic Interview (CIDI) developed for the World Mental Health (WMH) Survey Initiative, the WMH-CIDI. The CIDI was an expansion of the Diagnostic Interview Schedule (DIS), the first fully structured psychiatric diagnostic interview that could be administered by trained lay interviewers. Validity studies suggest the diagnoses generated by the lay interviewers are consistent with those obtained by clinicians who contacted a probability sample of survey respondents who previously met with lay interviewers (Kessler & Ustn, 2004).

## Content validity

Content validity was examined by comparing the scale items in the CESD to the diagnostic criteria for MDD and Dysthymia, in the DSM-IV-TR. When MDD or Dysthymia were better explained by another mental disorder, the participant had a value of “did not meet DSM-IV-TR criteria” for MDD or Dysthymia. For example, if a participant met the MDD criteria but it was clearly due to delusions or hallucinations, then the diagnosis assigned was Schizoaffective Disorder and not MDD. The DSM-IV-TR criteria state that a diagnosis of MDD requires the presence of five out of nine symptoms for a duration of at least two weeks, one of which must be depressed mood or anhedonia. The remaining symptoms are significant weight loss; insomnia or hypersomnia; psychomotor agitation or retardation; fatigue or loss of energy; feelings of worthlessness or excessive or inappropriate guilt; diminished ability to think or concentrate, or indecisiveness; recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide. The DSM-IV-TR criteria state that a diagnosis of Dysthymia requires the presence of depressed mood most of the day, more days than not, for at least two years and at least two of the following symptoms: poor appetite or overeating, insomnia or hypersomnia, low energy or fatigue, low self-esteem, poor concentration, difficulty making decisions and feelings of hopelessness.

## Statistical Analyses

Descriptive statistics were used to describe the sample characteristics. The construct validity of the CESD-12-NSAL was examined using t-test to compare the CESD score in individuals who did vs. did not meet the DSM-IV-TR criteria for MDD and Dysthymia, with Levene's test for the homogeneity of variance. Reliability estimates comprised item-to-total correlations (corrected), Cronbach's alpha if an item was deleted, and average inter-item correlations. Pearson's correlations were used.

## Results

Table 1 shows the average age of the sample was 42 years, with 12 years of education and an average income of $36,825. The mean score for depressive symptoms was 6.7, with 1.9% of the sample meeting the DSM-IV-TR criteria for MDD and 0.6% for Dysthymia. Table 1 also shows significant differences among African-American and Black Caribbean women and men in income ($F$=35.6, p<.0001), meeting the DSM-IV-TR criteria for MDD ($X^2$=5.5, p=.0035), and CESD-12-NSAL scores ($X^2$=11.7, p<.0001). Black Caribbean men reported

higher incomes than African-American men ($F$=10.06, p=.0025) and African-American women ($F$=75.71, p<.0001), and African-American men reported higher incomes than African-American women ($F$=37.87, p<.0001). African-American women were more likely to meet the DSM-IV-TR criteria for MDD than African-American men ($X^2$=15.5, p=.0004). African-American women reported more depressive symptoms than African-American men ($F$=21.33, p<.0001) and Black Caribbean women ($F$=23.75, p<.0001). No differences were found in age, years of education or meeting the DSM-IV-TR criteria for Dysthymia.

## Content validity

Table 2 compares the original 20 item CESD (Radloff, 1977) to the CESD-12-NSAL and shows how both scales correspond to the DSM-IV-TR symptoms of MDD and Dysthymia. Whereas the original 20 item CESD (Radloff, 1977) covers eight of the nine possible symptoms of MDD (does not address suicidal ideation/attempt/plan), the CESD-12-NSAL covers six of the nine possible symptoms of MDD (does not address weight/appetite changes, psychomotor agitation/retardation, or suicidal ideation/attempt/plan). The scale is most heavily loaded with affective symptoms of depression: Five items focus on depressed mood or anhedonia. The original 20-item CESD (Radloff, 1977) and the CESD-12-NSAL cover 6 of the 7 possible symptoms of Dysthymia. Neither the 20-item CESD nor the CESD-12-NSAL addresses difficulty making decisions.

## Construct validity for CESD-12-NSAL

Approximately 2% (n=99) of Black U.S. adults met the DSM-IV-TR criteria for MDD with a mean CESD-12-NSAL score of 14.8 (SD=7.5) compared to those who did not meet the DSM-IV-TR criteria for MDD (n=4716) with a mean score of 6.4 (SD=5.5). Levene's test was significant (p<.001), concluding that the variances of the two groups were not equal. Since the sample sizes and variances were unequal, separate variance t-test was performed, revealing that the CESD-12-NSAL scores of those who met the DSM-IV-TR criteria for MDD were significantly different than those who did not ($t$=11.1, p<.001). Approximately 1% (n=27) of Black U.S. adults met the DSM-IV-TR criteria for Dysthymia with a mean CESD-12-NSAL score of 16.2 (SD=6.8) compared to those who did not meet the DSM-IV-TR criteria for Dysthymia with a mean score of 6.5 (SD=5.6). Levene's test was not significant (p=.112), concluding that the variances of the two groups were equal. T-test revealed that the CESD-12-NSAL scores of those who met the DSM-IV-TR criteria for Dysthymia were significantly different than those who did not ($t$=8.9, p<.001).

Approximately 3% (n=63) of African-American women met the DSM-IV-TR criteria for MDD with a mean CESD-12-NSAL score of 14.5 (SD=7.6) compared to those who did not meet the DSM-IV-TR criteria for MDD (n=2,140) with a mean score of 6.9 (SD=5.9). Levene's test was significant (p<.001), concluding that the variances of the two groups were not equal. Since the sample sizes and variances were unequal, separate variance t-test was performed, revealing that the CESD-12-NSAL scores of those who met the DSM-IV-TR criteria for MDD were significantly different than those who did not ($t$=7.9, p<.001). Approximately 0.8% (n=17) of African-American women met the DSM-IV-TR criteria for Dysthymia with a mean CESD-12-NSAL score of 16.6 (SD=5.5) compared to those who did not meet the DSM-IV-TR criteria for Dysthymia (n=2,186) with a mean score of 7.1

(SD=6.0). Levene's test was not significant (p=.633), concluding that the variances of the two groups were equal. T-test revealed that the CESD-12-NSAL scores of African-American women who met the DSM-IV-TR criteria for Dysthymia were significantly different than African-American women who did not (*t*=6.5, p<.001).

Approximately 3% (n=12) of African-American men met the DSM-IV-TR criteria for MDD with a mean CESD-12-NSAL score of 19.6 (SD=5.6) compared to those who did not meet the DSM-IV-TR criteria for MDD (n=1,199) with a mean score of 6.1 (SD=5.1). Levene's test was not significant (p=.934), concluding that the variances of the two groups were equal. T-test revealed that the CESD-12-NSAL scores of African-American men who met the DSM-IV-TR criteria for MDD were significantly different than African-American men who did not (*t*=9.1, p<.001). Approximately 0.5% (n=6) of African-American men met the DSM-IV-TR criteria for Dysthymia with a mean CESD-12-NSAL score of 13.7 (SD=9.4) compared to African-American men who did not meet the DSM-IV-TR criteria for Dysthymia (n=1,205) with a mean score of 6.2 (SD=5.2). Levene's test was significant (p=.029), concluding that the variances of the two groups were not equal. Since the sample sizes and variances were unequal, separate variance t-test was performed, revealing that the CESD-12-NSAL scores of African-American men who met the DSM-IV-TR criteria for Dysthymia were not significantly different than African-American men who did not (*t*=1.9, p=.109).

Approximately 2.33% (n=20) of Black-Caribbean women met the DSM-IV-TR criteria for MDD with a mean CESD-12-NSAL score of 13.0 (SD=6.9) compared to those who did not meet the DSM-IV-TR criteria for MDD (n=832) with a mean score of 5.9 (SD=5.2). Levene's test was significant (p<.001), concluding that the variances of the two groups were not equal. Since the sample sizes and variances were unequal, separate variance t-test was performed, revealing that the CESD-12-NSAL scores of those who met the DSM-IV-TR criteria for MDD were significantly different than those who did not (*t*=4.6, p<.001). Approximately 0.5% (n=4) of Black-Caribbean women met the DSM-IV-TR criteria for Dysthymia with a mean CESD-12-NSAL score of 18.2 (SD=8.7) compared to those who did not meet the DSM-IV-TR criteria for Dysthymia (n=848) with a mean score of 6.0 (SD=5.3). Levene's test was not significant (p=.24), concluding that the variances of the two groups were equal. T-test revealed that the CESD-12-NSAL scores of Black-Caribbean women who met the DSM-IV-TR criteria for Dysthymia were significantly different than Black-Caribbean women who did not (*t*=4.6, p<.001).

Approximately 0.7% (n=4) of Black-Caribbean men met the DSM-IV-TR criteria for MDD with a mean CESD-12-NSAL score of 15.5 (SD=11.8) compared to those who did not meet the DSM-IV-TR criteria for MDD (n=545) with a mean score of 6.1 (SD=5.8). Levene's test was significant (p=.003), concluding that the variances of the two groups were not equal. T-test revealed that the CESD-12-NSAL scores of Black-Caribbean men who met the DSM-IV-TR criteria for MDD were not significantly different than Black-Caribbean men who did not (*t*=1.6, p=.198). None of the Black-Caribbean men met the DSM-IV-TR criteria for Dysthymia.

## Reliability

Three items had item-to-total score correlations less than 0.30 in the entire sample: “I felt like everything I did was an effort” (r=.24), “I felt hopeful about the future” (r=.25), and “I felt that I was just as good as other people” (r=.29). Two items had item-to-total score correlations less than .30 in African-American women: “I felt like everything I did was an effort” (r=.25) and “I felt hopeful about the future” (r=.26). Three items had item-to-total score correlations less than 0.30 in African-American and Black Caribbean men: “I felt like everything I did was an effort” (r=.22, r= .20 respectively), “I felt that I was just as good as other people” (r=.27, r=.25 respectively), and “I felt hopeful about the future” (r=.21, r=.21 respectively). Three items had item-to-total score correlations less than 0.30 in Black Caribbean women: “I felt like everything I did was an effort” (r=.25), “I felt that I was just as good as other people” (r=.26), and “People were unfriendly” (r=.28).

The Cronbach's alpha for the CESD-12-NSAL was 0.76, and varied from a low of .72 for Black Caribbean men to a high of .78 for African-American women. All alphas remained above 0.70 when all 12 items were individually deleted in the total sample. All of the alphas remained above 0.70 in African-American and Black Caribbean women. Two of the alphas dropped slightly below 0.70 in the African-American men: “I felt depressed” (r=.68) and “I was happy” (r=.69). Six of the alphas dropped slightly below 0.70 in Black Caribbean men: “I felt depressed” (r=.68), “I was happy” (r=.69), “I enjoyed life” (r=.69), “I had crying spells” (r=.69), “I felt that people disliked me” (r=.69) and “I could not get going” (r=.69).

Two items had all of their inter-item correlations below 0.30 in the entire sample: “I felt like everything I did was an effort” and “I felt that I was just as good as other people”. No items had inter-item correlations above 0.70. One item had all of their inter-item correlations below 0.30 in African-American and Black Caribbean women: “I felt like everything I did was an effort”. Two items had all of their inter-item correlations below 0.30 in African-American men: “I felt that I was just as good as other people” and “I felt like everything I did was an effort”. Three items had all of their inter-item correlations below 0.30 in Black Caribbean men: “I felt that I was just as good as other people”, “I felt like everything I did was an effort” and “I had trouble keeping my mind on what I was doing”.

## Discussion

The purpose of this secondary analysis was to examine the psychometric properties of the CESD-12-NSAL in a nationally representative sample of community-dwelling African-American and Black Caribbean Adults. The CESD-12-NSAL varied in validity and reliability by ethnicity and gender. Evidence was provided for construct validity in African-American and Black Caribbean women. However, evidence for construct validity was only provided for African-American men as it relates to MDD, not Dysthymia. No evidence was provided for construct validity in Black Caribbean men as it relates to MDD. None of the Black Caribbean men met the DSM-IV-TR criteria for Dysthymia, so evidence for construct validity for the CESD-12-NSAL related to Dysthymia could not be determined. All groups had item-to-total correlations and inter-item correlations below 0.30 with the item “I felt like everything I did was an effort”. Although little or no methodological justification was found for a minimum item-to-total correlation of 0.30 (Knapp & Brown, 1995), this was the only

item where all groups had inter-item correlations below 0.30. Although whether or not inter-item correlations should be between 0.30 and 0.70 depends on the number of items and the number of underlying dimensions (Knapp & Brown, 1995), all items in the CESD-12-NSAL had the same number of inter-item correlations and this was the only item that had all of its inter-item correlations below 0.30. There was another item ("I could not get going") measuring the same dimension (fatigue or loss of energy) which had item-to-total correlations and inter-item correlations above 0.30, suggesting that the dimension is not the issue, but questionable reliability in the item "I felt like everything I did was an effort". African-American and Black Caribbean men also had item-to-total correlations and inter-item correlations below 0.30 with the item "I felt that I was just as good as other people". No other item in the CESD-12-NSAL measured the same dimension (feelings of worthlessness or excessive or inappropriate guilt) as "I felt that I was just as good as other people". It is unclear if there is solely a problem with this item or its dimension in African-American and Black Caribbean men.

Based on the results from the current study, the recommendation is to eliminate the item "I felt like everything I did was an effort" in African-American and Black Caribbean women, resulting in 11 items in the CESD (CESD-11-NSAL). Table 1 depicts the differences in items between the scales. There was no change in measured dimensions between the CESD-12-NSAL and the CESD-11-NSAL. Evidence for construct validity remained the same in African-American and Black Caribbean women. The item-to-total score correlation improved slightly for the item "I felt hopeful about the future" (from r=.25 in CESD-12-NSAL to r=.28 in CESD-11-NSAL), while all other items remained higher than 0.30 in African-American women. Similarly, the item-to-total score correlation improved slightly for the item "I felt I was just as good as other people" (from .26 in the CESD-12-NSAL to r=.27 in the CESD-11-NSAL), and decreased slightly for the item "People were unfriendly" (from .28 in the CESD-12-NSAL to r=.26 in the CESD-11-NSAL) while all other items remained higher than 0.30 in Black Caribbean women. All of the alphas remained above 0.70 when all items were individually deleted, with the alpha for the CESD-11-NSAL at 0.80 in African-American women and 0.76 in Black Caribbean women. Similar to the CESD-12-NSAL, no item in the CESD-11-NSAL had all its inter-item correlations below 0.30 in African-American and Black Caribbean women. These alphas are considerably better than the one study that used the identical 12 CESD items, where alpha reliabilities were 0.64 for Blacks (Roberts & Sobhan, 1992).

Based on the results from the current study, the recommendation is to eliminate the items "I felt like everything I did was an effort" and "I felt that I was just as good as other people" in African-American and Black Caribbean men, resulting in 10 items in the CESD (CESD-10-NSAL). Table 1 depicts the differences in items between the scales. The major changes from the CESD-12-NSAL is the CESD-10-NSAL do not have any items that address the MDD domain related to feelings of worthlessness or excessive or inappropriate guilt or the Dysthymia domain of low-self-esteem. Evidence for construct validity remained the same for African-American men with respect to MDD. Similar to the CESD-12-NSAL, the CESD-10-NSAL scores for African-American men who met the DSM-IV-TR criteria for Dysthymia were still not significantly different than African-American men who did not meet criteria. Perhaps Dysthymia is not a valid construct in African-American men, a

finding that warrants further investigation. Similar to the CESD-12-NSAL, the CESD-10-NSAL scores for Black Caribbean men who met the DSM-IV-TR criteria for MDD were still not significantly different than Black Caribbean men who did not meet criteria. It may be that MDD is not a valid construct in Black Caribbean men, a diagnostic issue that deserves further study. No Black Caribbean men met the DSM-IV-TR criteria for Dysthymia. A search on PubMed for articles related to Dysthymia in African-American and Black Caribbean men and MDD in Black Caribbeans (excluding studies done with the NSAL) yielded no results, supporting a report of the Surgeon General that Blacks are underrepresented in mental health research (U.S. Department of Health & Human Services [USDHHS], 2001). The item-to-total score correlation improved slightly for the item “I felt hopeful about the future” (from r=.21 in CESD-12-NSAL to r=.22 in CESD-10-NSAL), while all other items were higher than 0.30, resulting in an improvement in the item “I felt that I was just as good as other people” (r=.21) in African-American and Black Caribbean men. The alpha for one item (“I felt depressed”) remained the same in the CESD-10-NSAL as the CESD-12-NSAL (0.68) when all items were individually deleted, with the alpha for the CESD-10-NSAL at 0.73 in African-American and Black Caribbean men. Five of the six items with alphas below 0.70 in the CESD-12-NSAL increased ≥ 0.70 in the CESD-10-NSAL for Black Caribbean men. No items in the CESD-10-NSAL had all its inter-item correlations below 0.30 in African-American and Black Caribbean men.

A cut-score of 16 was used on the 20-item version (Radloff, 1977). The CESD-11-NSAL and CESD-10-NSAL have the same response options for each item as the original 20-item version: 0-1-2-3, but with a maximum score of 33 and 30 respectively, instead of 60 with the 20-item version. Kohout's formula was used to determine a standardized cut-score using an arithmetic conversion based on the possible total score (Kohout, Berkman, Evans, & Cornoni Huntley, 1993). Since the CESD-11-NSAL has 11 items, the total score was 33/60=0.55, yielding a cut-score of 16 × 0.55 = 8.8, or approximately 9. Similarly, since the CESD-10-NSAL has 10 items, the total score was 30/60=0.50, yielding a cut-score of 16 × 0.50 = 8.0. This method has been used to determine the cut score of various shorter forms of the original 20-item CESD (Zauszniewski, 2009).

One unexpected finding was the mean CESD scores were higher for women who met the DSM-IV-TR criteria for Dysthymia than MDD. The mean CESD-12-NSAL scores for African-American and Black Caribbean women who met the DSM-IV-TR criteria for Dysthymia were 16.6 (SD=5.5) and 18.2 (SD=8.7) respectively, compared to means for MDD with 14.5 (SD=7.6) and 13.0 (SD=6.9) respectively. Dysthymia has traditionally been considered less severe than MDD. A diagnosis of Dysthymia requires the presence of depressed mood most of the day, more days than not, for at least two years and at least two additional symptoms for a total of at least three symptoms out of a possible seven. In contrast, a diagnosis of MDD requires the presence of five out of nine symptoms for a duration of at least two weeks, one of which must be depressed mood or anhedonia. The symptoms between the two diagnoses are similar, except Dysthymia includes difficulty making decisions, while MDD includes anhedonia, psychomotor agitation or retardation and recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide. The current results suggest that African-American and Black Caribbean women living in the U.S. experience more depressive

symptoms with Dysthymia than with MDD. Future studies are needed to determine if more depressive symptoms in Dysthymia is associated with worse outcomes than MDD in African-American and Black Caribbean women living in the U.S.

Our results are consistent with a confirmatory factor analysis on African-American pregnant women that found the item, “I felt like everything I did was an effort” showed a low item-total correlation (r=.04) and was excluded from further analysis (Canady, Stommel, & Holzman, 2009). However, no studies were found that reported problems with the item, “I felt that I was just as good as other people” in Black U.S. adults. Since little research has been done testing the validity of the CESD on Black Caribbeans living in the U.S., perhaps there are some subtle differences in their background compared to African-Americans that is contributing to questionable reliability on this item. For example, the current study found Black Caribbean men reported higher incomes than African-American men and African-American women, despite no differences in years of education. In addition, there were no differences in reported income between Black Caribbean men and women, while African-American men reported higher incomes than African-American women. More research should be conducted on both of these items in samples which include adequate numbers of Black Caribbeans before any definite conclusions can be drawn.

There are several shortened versions of the CESD (Zauszniewski, 2009; Zauszniewski & Graham, 2009). A 16-item version (Lawton, Moss, Winter, & Hoffman, 2002) was not validated in Black U.S. adults and used different items than those in the NSAL. Two 12-item CESD scales have been validated in children and/or adolescents (Poulin, Hand, & Boudreau, 2005; Roberts & Sobhan, 1992). Only one of the CESD-12 scales has been validated in a nationally representative sample of Black adolescents living in the U.S. (Roberts & Sobhan, 1992), and is identical to the one used in the NSAL. Other validated CESD scales with fewer items included an 11 (Kohout et al., 1993), 10 (Andresen, Malmgren, Carter, & Patrick, 1994; Cole, Rabin, Smith, & Kaufman, 2004; Kohout et al., 1993), 9 (Santor,D.A., Coyne,J.C., 1997), 8 (Turvey, Wallace, & Herzog, 1999) and 5 (Bohannon, Maljanian, & Goethe, 2003; Lewinsohn, Seeley, Roberts, & Allen, 1997) item CESD, none of which made reference to Black U.S. adults or included the same items used in the NSAL. One study included a sample of majority African-Americans (Melchior, Huba, Brown, & Reback, WINTER 1993), but exclusively female from one large city, with different items than those in the NSAL. Another study included Black U.S. adults, comprising U.S and non-U.S. born (Shrout & Yager, 1989), but did not stratify results by race.

There are limitations to this study. This is a secondary analysis of an existing dataset. Only data from 12 items of the CESD is available. The NSAL did not measure minor depression. Since supplemental sampling was restricted to census geographic areas that exceeded a minimum population density for Caribbean Blacks, Blacks from the Caribbean are disproportionately sampled over Blacks from other countries, such as those from Africa and Central and South America. However, 60% of foreign-born Blacks are from the Caribbean, compared to 24% from Africa and 12% from Central and South America (McKinnon & Bennett, 2005, August). In addition, participants had to be able to complete the interview in English. For the Black Caribbean group, generalizability is limited to Blacks who either

come from English speaking countries, or they had to live in the U.S. long enough to master English. Recent Black immigrants from non-English countries, such as Haiti, the Dominican Republic and Cuba are not represented in the current study. However, the three countries that send the most Black Caribbean immigrants are Jamaica, Haiti and Trinidad and Tobago (Kent, 2007). English is the official language of Jamaica and Trinidad and Tobago. In addition, the vast majority of immigrants from the Dominican Republic and Cuba do not self-identify as Black (Kent, 2007), a requirement for inclusion in the NSAL. Finally, the Black Caribbean sample had high refusal rates, especially after the September 11, 2001 terrorist attacks on the World Trade Center in New York as a significant proportion of the total Caribbean sample was located in the New York and New Jersey areas (Jackson et al., 2004). In addition, there were fears and suspicions concerning questions about possible immigration status (Jackson et al., 2004). Given the high refusal rate, the response rate was still 70.7% for the African American and 77.7% for the Caribbean Black sample (Jackson et al., 2004).

Despite these limitations, the current study has much strength. This study was comprised of a nationally representative sample of African-American and the first ever national probability study of Black Caribbeans living in the U.S. (Jackson et al., 2004). There was race/ethnic matching of interviewers and respondents, with face-to-face interviews. Evidence has been provided for the validity and reliability of the CESD-11-NSAL in African-American and Black Caribbean women and the CESD-10-NSAL in African-American and Black Caribbean men to study the relationship between depressive symptoms and other variables.

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## Table 1

### Sample Characteristics

| | Mean (Confidence Interval) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Total** | **African-American** | | **Black Caribbean** | | ***F*** | **p** |
| | | **Women (n=2,203)** | **Men (n=1,211)** | **Women (n=852)** | **Men (n=549)** | | |
| Age | 42 (41-43) | 42 (41-43) | 42 (40-43) | 41 (39-42) | 40 (38-43) | 1.1 | .37 |
| Years of Education | 12.5 (12.3-12.6) | 12.4 (12.3-12.7) | 12.5 (12.2-12.7) | 12.8 (12.4-13.3) | 12.8 (12.5-13.1) | 2.2 | .09 |
| Household Income * | 36,825 (34,240-39,411) | 31,854 (29,542-34,165) | 41,775 (37,871-45,678) | 42,408 (32,690-52,126) | 49,675 (46,209-53,141) | 35.6 | <.0001 |
| CESD-12-NSAL | 6.7 (6.3-7.0) | 7.1 (6.7-7.5) | 6.1 (5.7-6.6) | 5.6 (5.2-6.1) | 6.8 (5.1-8.5) | 11.7 | <.0001 |
| | | | No. (%) | | | $X^2$ | p |
| Major Depressive Disorder | 99 (1.9) | 63 (75.8) | 12 (17.3) | 20 (3.1) | 4 (3.8) | 5.5 | .0035 |
| Dysthymia | 27 (0.6) | 17 (74.8) | 6 (24.1) | 4 (1.1) | 0(0) | 2.0 | .14 |

* top coded at $200,000

**Table 2**

**Content analysis of items from the CESD-12-NSAL matched to DSM-IV symptoms for Major Depressive Disorder**

| CESD original 20 items | CESD-12-NSAL | CESD-11-NSAL | CESD-10-NSAL | Major Depressive Disorder | Dysthymia |
|---|---|---|---|---|---|
| I felt depressed. | x | x | x | Depressed mood | Depressed mood |
| I had crying spells. | x | x | x | Depressed mood | Depressed mood |
| I was happy. | x | x | x | Depressed mood | Depressed mood |
| I felt sad. | - | - | - | Depressed mood | Depressed mood |
| I felt I could not shake off the blues even with help from my family or friends. | - | - | - | Depressed mood | Depressed mood |
| I enjoyed life. | x | x | x | Markedly diminished interest or pleasure | Unrelated item |
| I felt like everything I did was an effort. | x | - | - | Fatigue or loss of energy | Fatigue or low energy |
| I could not get “going”. | x | x | x | Fatigue or loss of energy | Fatigue or low energy |
| I felt that I was just as good as other people. | x | x | - | Feelings of worthlessness or excessive or inappropriate guilt | Low-self-esteem |
| I felt my life had been a failure. | - | - | - | Feelings of worthlessness or excessive or inappropriate guilt | Low-self-esteem |
| I had trouble keeping my mind on what I was doing. | x | x | x | Diminished concentration | Poor concentration |
| My sleep was restless. | x | x | x | Insomnia or hypersomnia | Insomnia or hypersomnia |
| I did not feel like eating; my appetite was poor. | - | - | - | Weight or appetite changes | Poor appetite or overeating |
| I talked less than usual. | - | - | - | Psychomotor agitation or retardation | Unrelated item |
| People were unfriendly. | x | x | x | Unrelated item | Unrelated item |
| I felt that people disliked me. | x | x | x | Unrelated item | Unrelated item |
| I felt hopeful about the future. | x | x | x | Unrelated item | Unrelated item |
| I was bothered by things that don't usually bother me. | - | - | - | Unrelated item | Unrelated item |
| I felt fearful. | - | - | - | Unrelated item | Unrelated item |
| I felt lonely. | - | - | - | Unrelated item | Unrelated item |
| | - | - | - | Suicidal ideation/attempt/plan | Unrelated item |
| | - | - | - | Unrelated item | Difficulty making decisions |