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Acculturation and the Center for Epidemiological Studies Depression Scale for Hispanic Women

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Abstract

Background—Culturally valid measures of depression for Spanish-speaking Hispanic women are important for developing and implementing effective interventions to reduce health disparities. The Center for Epidemiological Studies--Depression Scale (CES-D) is a widely used measure of depression. Differential item functioning has been studied using language preference as a proxy for acculturation, but it is unknown if the results were due to acculturation or the language of administration.

Objective—To evaluate the relationship of acculturation, defined with a dimensional measure, to Spanish CES-D item responses.

Method—Spanish-speaking Hispanic women ($n = 504$) were recruited for a randomized controlled trial of *Salud, Educación, Prevención y Autocuidado* (Health, Education, Prevention and Self-care). Acculturation, an important dimension of variation within the diverse United States Hispanic community, was defined by high or low scores on the Americanism subscale of the Bidimensional Acculturation Scale. Differential item functioning for each of the 20 CES-D items between more acculturated and less acculturated women was tested using ordinal logistic regression.

Results—No items on the Depressed Affect, Somatic Activity, or Positive Affect subscales showed meaningful differential item functioning, but one item (“People were unfriendly”) on the Interpersonal subscale had small results ($R^2 = 1.1\%$).

Discussion—The majority of CES-D items performed similarly for Spanish-speaking Hispanic women with high and low acculturation. Less acculturated women responded more positively to

“People were unfriendly,” despite having an equivalent level of depression, than more acculturated women. Possibilities for improving this item are proposed.

Keywords

acculturation; depression; Hispanic; women; CES-D

The Center for Epidemiological Studies--Depression Scale (CES-D; Radloff, 1977) is a public domain self-report scale of depression developed using non-Hispanic samples, but it is used widely with Hispanics (e.g., Chiriboga, Jang, Banks, & Kim, 2007; Cho et al., 1993; Guarnaccia, Angel, & Worobey, 1989). The experience of mental states such as depression can vary according to cultural context (Chiriboga et al., 2007) and researchers have questioned the validity of measures of depression developed with members of one culture for members of another (Bravo, 2003). The CES-D items may not assess depression in the same way across groups, especially for members of groups who have different perceptions of depression. Valid measurement requires that items and underlying constructs are equivalent across groups. Despite the complex, culturally rooted nature of depression, the psychometric equivalence of the CES-D within the heterogeneous population of United States Hispanic women has been studied rarely. Culturally valid depression measures are important for understanding and eliminating disparities of incidence, prevalence, and treatment for depression in Hispanic women (Ramirez, Ford, Steward, & Teresi, 2005).

The elimination of health disparities, including depression for Hispanic women, is a major goal of Healthy People 2010 (U.S. Department of Health & Human Services [DHHS], 2000). The World Health Organization (WHO; 2000) projects depression to be the second leading cause of global disease burden by 2020; recent estimates show a third to a half of individuals will be affected by 2020. Mental health problems like depression are a leading health indicator (DHHS, 2000). Hispanic women experience disparities in depression related to both gender and minority status. Nearly 20% of women in the general population are estimated to have a major depressive episode in their lifetime, compared to only about 10% of men (Substance Abuse and Mental Health Service Administration [SAMHSA], 2008; WHO, 2000). Risk factors for depression, such as economic inequality, perceptions of inferior social status, unequal responsibility for caregiving, and intimate partner violence, are experienced disproportionately by women (WHO, 2000). Although the prevalence of depression for Hispanics is roughly equivalent to the prevalence of depression in other racial and ethnic groups (SAMHSA, 2008), Hispanics are treated in much lower numbers. Only 42% of minorities with depression receive treatment compared to 63% of non-Hispanic Whites (Centers for Disease Control, 2010).

One way to evaluate cultural equivalence of a measure is to compare that instrument across ethnic groups. However, studies with this design have limitations. Important differences other than culture that exist between groups (e.g., socioeconomic status) may be overlooked. Measurement differences related to variation in aspects of culture (e.g., values, practices, identifications) that may exist *within* ethnic groups may not be examined. The U.S. Hispanic community is a diverse, multigenerational group of native Americans and immigrants with a variety of backgrounds, language preferences, and cultural values, and much variation among individuals with similar national origins.

An important dimension of variation with respect to depression is acculturation. Acculturation is the process of change in an individual's cultural orientation that results when a person moves from their original cultural context to a new cultural context (Berry, 1997). Because acculturation refers to cultural change, acculturation is likely associated with changes in cognition and emotion, and with changes in perceptions of depression. Therefore,

examining if the CES-D is equivalent for Hispanic individuals with different levels of acculturation is useful to understanding this dimension of validity of the CES-D items. The purpose of this study is to evaluate the relationship of acculturation to responses to the CES-D items administered in Spanish to adult Hispanic women.

Culture may influence responses to the CES-D for many reasons. The meaning of the original English CES-D items (e.g., *the blues*) may be lost in translation for non-English speakers (Vega & Rumbaut, 1991). Some Hispanic people have been noted to express emotional and mental health as physical health symptoms (Guarnaccia et al., 1989), which may be different from non-Hispanic White people. That is, individuals with depression may be less likely to report sadness or irritability, but more likely to report sleep problems, change in appetite, or fatigue (Kleinman & Good, 1985).

Hispanic culture values such as *simpatia* (harmony in relationships) or *familism* (an interdependent and collaborative family is prioritized over the individual) are believed to influence cognition and emotions in general and depression in particular (Markus & Kitayama, 1991). Individuals with high *simpatia* may view an interpersonal conflict as insulting or assaulting dignity, whereas an individual with lower *simpatia* might view the same behavior as neutral (Triandis, Marin, Lisansky, & Betancourt, 1982). Individuals with high *familism* could develop depression in response to disruptions in family relationships (Lewis-Fernandez & Kleinman, 1994). Moreover, *simpatia* or *familism* could lead to underreporting of some depressive symptoms resulting from not wanting to burden others with personal problems (Varela, Steele, & Benson, 2007). *Familism* may be particularly influential with Hispanic women, who may follow the role of *mother as nurturer* and subordinate self-care to childcare.

Differential item functioning (DIF) is a widely used method for establishing equivalence and detecting measurement bias across groups (Penfield & Lam, 2000). Based on item response theory, DIF analyses assess the probability of endorsing an item after individuals from different groups are equated on the latent variable that the instrument is designed to measure (Rogers & Swaminathan, 1993; Zumbo, 1999). In the current study, the latent variable is depression. When significant, DIF indicates item bias (uniform or nonuniform). A biased item should be improved or eliminated from the instrument. Uniform DIF occurs when different groups are not equally likely to endorse items despite having equal levels of the latent variable. This difference in likelihood is consistent across all levels of the latent variable. Nonuniform DIF occurs when differences in the likelihood of item endorsement also vary across levels of the latent variable. In regression analysis, after controlling for the latent variable, a main effect of group (i.e., differences between high and low acculturation groups) indicates uniform DIF and a group x latent variable interaction indicates nonuniform DIF.

Only two studies were located examining the relationship of acculturation to CES-D items in samples of Hispanics. Chiriboga et al. (2007) found significant differences in all 20 items between high or low acculturation with Mexican American elders. However, they did not statistically control for the elders' level of depression, making it unclear whether the differences reflected true differences in depression or DIF. Using a logistic regression method to control for depression, Nguyen et al. (2007) found several CES-D items had DIF between high or low acculturation (defined by English or Spanish preference) with pregnant Hispanic women. Controlling for depression level, women who preferred English were more likely to endorse item 20 (*Get going*), but women who preferred Spanish were more likely to endorse several items: 1 (*Bothered*), 7 (*Effort*), 11 (*Sleep*), 4 (*Good*), 12 (*Happy*), and 16 (*Enjoyed*). The main limitation of this study was that language preference of participants was confounded with language of test items, making it unclear whether the DIF was due to

the woman's acculturation (language preference) or differences between the English and Spanish versions of the items.

The objective of the current study was to examine the relationship between acculturation and participant responses to the 20 items on the Spanish language CES-D in a sample of Spanish-speaking Hispanic women. The primary research question was: Is there DIF on the 20 CES-D items for women with high or low acculturation? Specifically, do women with different levels of acculturation, but similar levels of depression, have the same probability of endorsing CES-D items? Do differences in item response probability also differ across levels of depression?

Method

Participants were 504 Hispanic women (of 871 recruited) from a randomized trial of *Salud, Educación, Prevención y Autocuidado* (SEPA; Health, Education, Prevention and Self-care; Peragallo, Gonzalez-Guarda, McCabe, & Cianelli, 2011), a sexual health group intervention in South Florida. Women received measures in Spanish at trial intake, excluding 44 women (of 548 randomized) who chose to receive the measures in English. To be eligible for the trial, women had to be between the ages of 18 and 50 years and report sexual activity 3 months prior to trial intake. Both the University of Miami and Florida Department of Health and Human Services Institutional Review Boards approved the study prior to recruitment. Participants were recruited from (a) a community-based social service (e.g., English classes, childcare, job development and placement, and health education) organization for Hispanics, (b) an urban Florida Department of Health site, (c) from flyers posted in the community, and (d) public service messages delivered via mass media.

Assessments were conducted between January 2008 and April 2009 at the community organization and at a nearby office that was rented when space was limited at the community organization. A web-based software system (Velos, Fremont, CA) was used by assessors to document participant responses on a computer. Anchor sheets with each item and response choices were provided to participants so they could read along with assessors. Women received \$50 for participation.

The CES-D (Radloff, 1977) has 20 questions addressing the frequency [0 = rarely or none of the time/*casi nunca o nunca* (less than 1 day), 3 = most of the time/*casi siempre o siempre* (5 – 7 days)] of depressive symptoms experienced in the past week. Responses to each item are added for a total ranging from 0 to 60, and are then grouped into four subscales: Depressed Affect, Somatic Activity, Interpersonal Problems, and Positive Affect. Although the CES-D is not a diagnostic instrument, scores of 16 and above have been used to indicate an increased likelihood of clinical depression. [see Figure, Supplemental Digital Content 1, which shows English and Spanish items (Roberts, 1980), <http://links.lww.com/NRES/A53>.] Internal consistency was high ($\alpha = .85$) for the original English sample (Radloff, 1977), the original Spanish translation ($\alpha = .88$; Roberts, 1980), more recent samples of Hispanic women ($\alpha = .91$; Gonzalez-Guarda, Peragallo, Vasquez, Urrutia, & Mitrani, 2009), and the current sample ($\alpha = .93$ and $.94$ for low and high acculturation women, respectively).

Acculturation to the US was measured using the Americanism subscale of the Bidimensional Acculturation Scale (BAS; Marin & Gamba, 1996), a 24-item measure of several domains including language use, linguistic proficiency, and use of electronic media in either Spanish or English. (The Hispanicism subscale was not used in this study because 99% of women in the sample had high Hispanicism scores.) To score the Americanism subscale, 12 items are averaged, giving a range between 1 (low) and 4 (high). As suggested by the scale authors, acculturation was divided into two levels using the scales midpoint:

≤ 2.5 for low acculturation ($n = 350$) and > 2.5 for high acculturation ($n = 154$). High internal consistency ($\alpha = .96$) was reported in the original Hispanic sample (Marin & Gamba, 1996). In this study reliability was high ($\alpha = .93$ and $.94$ for low and high acculturation women, respectively).

To assess DIF ordinal logistic regression was used following the three-step analysis method described by Zumbo (1999). Separate regressions were used for each CES-D item. In the first step, the CES-D total score was entered as the independent variable. Entering the total CES-D score described the main effect of depression on the probability of endorsing each item at a particular level (0 to 3). In the second step, acculturation group (high or low) was entered as an independent variable. Entering this variable showed the main effect of acculturation on the probability of endorsing an item, after controlling for total CES-D score. Controlling for the total depression score equates participants on the latent construct being measured. A significant change (a 1df chi-square test) between the first and second steps indicated uniform DIF. In the third step, an interaction term (the product of CES-D total and acculturation group) was entered as an independent variable. A significant change (a 1df chi-square test) between the second and third step indicated nonuniform DIF. Cohen's (1987) guidelines on effect size were used: small, $d = .2$, $R^2 = 1\%$; medium, $d = .5$, $R^2 = 6\%$; and large, $d = .8$, $R^2 = 14\%$.

Results

Demographic characteristics of the sample separated by high and low acculturation to the US are shown in Table 1. There was a small ($d = .29$) significant difference in age and a small ($d = .19$) significant difference in education between women with low acculturation and women with high acculturation, but overall the two groups were very similar. As shown in the left columns of Table 2, without controlling for level of depression women with high acculturation had significantly higher means on CES-D item 7 (*I felt that everything I did was an effort*) than women with low acculturation, but women with high acculturation had lower scores on item 15 (*People were unfriendly*) than women with low acculturation.

The columns on the right side of Table 2 show the DIF statistics of all 20 items between women with high and low acculturation. These analyses controlled for the total CES-D score. None of the items in the Depressed Affect and Somatic Activity subscales showed evidence of DIF between women with high or low acculturation. Item 15 (*Unfriendly*) on the Interpersonal subscale showed small ($\Delta R^2 = 1.1\%$) uniform DIF, which indicated that acculturation explained just over 1% of the variation in item 15, after controlling for depression level. From the Positive Affect subscale item 12 (*Happy*) had trivial uniform DIF ($\Delta R^2 < 1\%$) and item 4 (*Good*) had trivial nonuniform DIF ($\Delta R^2 < 1\%$).

As a follow-up to determine if DIF was due solely to language preference or proficiency, the DIF analyses were repeated three times using acculturation groups created with the three subscales of the BAS: language proficiency, language use frequency, and social events or electronic media. As with the original analyses, significant nontrivial DIF was found on item 15 (*Unfriendly*) when the language proficiency and social events/electronic media subscales were used, but not when the language use frequency subscale was used. No additional DIF effects were found for any items.

Discussion

The objective of this study was to examine the relationship between acculturation of adult Hispanic women to the US and item responses on the Spanish language CES-D instrument. No substantive DIF effects with respect to acculturation were found for 19 of the 20 CES-D

items with the Spanish-speaking Hispanic women in this study. There was small ($\Delta R^2 = 1.1\%$) uniform DIF on item 15 (*Unfriendly*), which indicated that item 15 performed differently for women with low acculturation than for those with high acculturation. Specifically, controlling for level of depression for women with low Americanism, the women responded more positively to item 15 (i.e., more strongly endorsed that people were unfriendly) than women with high Americanism. Higher mean scores on item 15 for women with low Americanism were possibly related to factors other than depression.

The small DIF on item 15 may be explained by interpersonal problems related to not adopting the majority culture. Discrimination against individuals with low acculturation has been noted (e.g., Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Future researchers could conduct a qualitative study to understand how interpersonal problems relate to the response frequency of item 15 (i.e., Is discrimination based on cultural difference related to the participant's perception that people were more unfriendly?). It is possible this item's wording was not focused on emotional experience, and that DIF would be reduced if the translation was changed to focus on the respondent's mental state (e.g., *I felt people were unfriendly*) as with item 19 (*I felt that people disliked me*).

This study had several limitations. Nonrandom sampling restricted generalization. Inferences about cross-cultural or cross-gender comparisons with the CES-D were beyond the scope of this study. Future studies should include men and non-Hispanic people. The lack of a clinician rating of depression prevented conclusions about the use of the CES-D as a clinical depression measure. Although scores of nearly half ($n = 230$, 46%) of the women in this sample were above the cutoff for likely clinical depression (16; Radloff, 1977), researchers have suggested that the CES-D may be too sensitive (i.e., high false positives) with Hispanic samples (Cho et al., 1993; Kim, Chiriboga, & Jang, 2009). The finding of DIF suggests that women with lower acculturation may be more likely to have a false positive for depression due to agreeing more strongly to item 15. That is, individuals with low acculturation are more likely to endorse this item at a higher level, and thus have a higher score on the CES-D, than individuals with high acculturation with the same level of underlying depression. Further investigation of cutoffs for Hispanic women is warranted.

These results were different than reported in previous research. The DIF found by Nguyen et al. (2007) may not have been related to participants' acculturation, but to language (English or Spanish) of the CES-D items. More research should be conducted to understand how (a) item language may influence scores on depression scales and (b) item language may influence the experience of depression. However, nonsignificant DIF in the current study may be due to a restricted range of cultural variables in the sample due to sampling only Spanish speakers. It is possible that sampling women who chose to receive measures in Spanish avoided confounding the woman's language with the measure's language, but may have limited the sample to women with typical Hispanic perceptions of depression. Researching the relationship of acculturation to the CES-D requires researchers to balance studies that sample participants who prefer English or Spanish (e.g., Nguyen et al., 2007) with studies that sample only those who prefer Spanish. Using multidimensional measures of acculturation in future studies would address the complexity of the acculturation process (Schwartz et al., 2010).

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References

- Berry JW. Immigration, acculturation, adaptation. *Applied Psychology: An International Review*. 1997; 46:5–68.
- Bravo, M. Instrument development: Cultural adaptations in ethnic minority research. In: Bernal, G.; Trimble, J.; Burlew, A.; Leong, F., editors. *Handbook of racial ethnic minority psychology*. Newbury Park, CA: Sage; 2003.
- Centers for Disease Control. Data 2010: The Healthy People 2010 database. Mental Health and Mental Disorders by Race and Ethnicity (all). 2010. Retrieved from: <http://wonder.cdc.gov/data2010/focraceg.htm>
- Chiriboga DA, Jang Y, Banks S, Kim G. Acculturation and its effect on depressive symptom structure in a sample of Mexican American elders. *Hispanic Journal of Behavioral Sciences*. 2007; 29:83–100.
- Cho M, Moscicki E, Narrow W, Rae D, Locke B, Regier A. Concordance between two measures of depression in the Hispanic Health and Nutrition Examination Survey. *Social Psychiatry and Psychiatric Epidemiology*. 1993; 28(4):156–163.10.1007/BF00797317 [PubMed: 8235801]
- Cohen, J. *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1987. revised
- Gonzalez-Guarda RM, Peragallo N, Vasquez EP, Urrutia MT, Mitrani VB. Intimate partner violence, depression, and resource availability among a community sample of Hispanic women. *Issues In Mental Health Nursing*. 2009; 30:227–236. [PubMed: 19363727]
- Guarnaccia PJ, Angel R, Worobey JL. The factor structure of the CES-D in the Hispanic Health and Nutrition Examination Survey: The influences of ethnicity, gender, and language. *Social Science & Medicine*. 1989; 29(1):85–94. [PubMed: 2740931]
- Kim G, Chiriboga DA, Jang Y. Cultural equivalence in depressive symptoms in older White, Black, and Mexican-American adults. *Journal of the American Geriatrics Society*. 2009; 57(5):790–796. [PubMed: 19484834]
- Kleinman, A.; Good, B. *Culture and depression: Studies in the anthropology and cross-cultural psychiatry of affect and disorder*. Berkeley, CA: University of California Press; 1985.
- Lewis-Fernandez R, Kleinman A. Cultural, personality, and psychopathology. *Journal of Abnormal Psychology*. 1994; 103:67–71. [PubMed: 8040483]
- Markus HR, Kitayama S. Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*. 1991; 98(2):224–253.
- Marín G, Gamba RJ. A new measurement of acculturation for Hispanics: The Bidimensional Acculturation Scale for Hispanics (BAS). *Hispanic Journal of Behavioral Sciences*. 1996; 18(3): 297–316.
- Nguyen HT, Clark M, Ruiz RJ. Effects of acculturation on the reporting of depressive symptoms among Hispanic pregnant women. *Nursing Research*. 2007; 56(3):217–223. [PubMed: 17495578]
- Penfield RD, Lam TCM. Assessing differential item functioning in performance assessment: review and recommendations. *Educational Measurement: Issues and Practice*. 2000; 19:5–15.
- Peragallo N, Gonzaelez-Guarda RM, McCabe BE, Cianelli R. The efficacy of an HIV risk reduction program among a multinational and socioeconomically diverse sample of Hispanic women. Manuscript submitted for publication. 2011
- Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1:385–401.
- Ramirez M, Ford ME, Steward AL, Teresi JA. Measurement issues in health disparities research. *Health Services Research*. 2005; 40:1640–1657. [PubMed: 16179000]
- Roberts RE. Reliability of the CES-D scale in different ethnic contexts. *Psychiatry Research*. 1980; 2:125–134. [PubMed: 6932058]
- Rogers HJ, Swaminathan H. A comparison of logistic regression and Mantel-Haenszel procedures for detecting differential item functioning. *Applied Psychological Measurement*. 1993; 17:105.
- Schwartz SJ, Unger JB, Zamboanga BL, Szapocznik J. Rethinking the concept of acculturation: implications for theory and research. *American Psychologist*. 2010; 65(4):237–251. [PubMed: 20455618]

- Substance Abuse and Mental Health Services Administration. Results from the 2005 national survey on drug use and health: National findings. 2008. Retrieved from: <http://www.oas.samhsa.gov/nsduh/2k5nsduh/AppG.htm#TabG-43>
- Triandis HC, Marin G, Lisansky J, Betancourt H. Simpatia as a cultural script of Hispanics. *Journal of Personality and Social Psychology*. 1982; 47(6):1363–1375.
- United States Department of Health & Human Services. *Healthy People 2010: Understanding and improving health*. 2. Washington, DC: Author; 2000.
- Varela RE, Steele RG, Benson ER. The contribution of ethnic minority status to adaptive style: A comparison of Mexican, Mexican American, and European American children. *Journal of Cross-Cultural Psychology*. 2007; 38:26–33.
- Vega WA, Rumbaut RG. Ethnic minorities and mental health. *Annual Review of Sociology*. 1991; 17(1):351–383.
- World Health Organization. *Women's mental health: An evidence-based review*. 2000. Retrieved from http://whqlibdoc.who.int/hq/2000/WHO_MSD_MDP_00.1.pdf
- Zumbo, BD. *A handbook of theory and methods of differential item functioning (DIF)*. Ottawa, Ontario: Directorate of Human Resources Research and Evaluation, Department of National Defense; 1999.

1.	I was bothered by things that usually don't bother me	Me han molestado cosas que normalmente no me molestan
2.	I did not feel like eating; my appetite was poor	No tuve ganas de comer, no tuve apetito
3.	I felt that I could not shake off the blues even with help from my family or friends	No he podido superar el sentirme triste ni siquiera con la ayuda de mi familia o mis amigos
4.	I felt that I was just as good as other people (reverse)	Me sentí de igual valor que otra gente
5.	I had trouble keeping my mind on what I was doing	Tuve problemas en concentrarme con lo que hacía
6.	I felt depressed	Me sentí deprimida/o
7.	I felt that everything I did was an effort	Sentí que todo lo que hacía era un esfuerzo
8.	I felt hopeful about the future (reverse)	Me sentí esperanzada/o en el futuro
9.	I thought my life had been a failure	Sentí que mi vida ha sido un fracaso
10.	I felt fearful	Me sentí con miedo
11.	My sleep was restless	No dormí bien
12.	I was happy (reverse)	Me sentí feliz
13.	I talked less than usual	Hablé menos que de costumbre
14.	I felt lonely	Me sentí sola/o
15.	People were unfriendly	La gente fue poco amable
16.	I enjoyed life (reverse)	Disfruté de la vida
17.	I had crying spells	Lloré a veces
18.	I felt sad	Me sentí triste
19.	I felt that people disliked me	Sentí que la gente no me quiere
20.	I could not get 'going'	No tuve ánimo

Notes. Both English and Spanish versions of the CES-D are freely available to the public; Radloff, 1977; Roberts, 1980

Figure 1. English and Spanish Items

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Table 1

Characteristics of Hispanic Women with Low and High Acculturation to the United States

<i>Characteristic</i>	Low (<i>n</i> = 350)	High (<i>n</i> = 154)
Age, <i>M</i> (<i>SD</i>)	39.82 ** (7.60)	37.36 (9.09)
Monthly Income (after taxes), <i>n</i> (%)		
Less than \$1000	99 (28%)	36 (23%)
\$1000 – \$2000	144 (41%)	67 (44%)
\$2000 – \$3000	66 (19%)	24 (16%)
More than \$3000	37 (11%)	26 (17%)
Born in the US, <i>n</i> (%)	2 *** (1%)	13 (8%)
Born outside of the US, <i>n</i> (%)	348 (99%)	141 (92%)
Columbia	133 (38%)	53 (34%)
Cuba	50 (14%)	13 (8%)
Mexico/Puerto Rico	21 (6%)	16 (10%)
Other, South America	54 (15%)	38 (25%)
Other, Caribbean/Central America	90 (26%)	21 (14%)
Years of education, <i>M</i> (<i>SD</i>)	13.25 * (3.50)	13.92 (3.43)
Number of children, <i>M</i> (<i>SD</i>)	1.70 (1.25)	1.46 (1.39)
In a relationship/married, <i>n</i> (%)	265 (76%)	105 (68%)
Employed, <i>n</i> (%)	116 (33%)	53 (34%)
CES-D total, <i>M</i> (<i>SD</i>) range	15.87 (12.53) 0 – 55	16.46 (13.41) 0 – 52

*Notes.**
p < .05.**
p < .01.***
p < .001. Five women (1%) did not report income.

Table 2

Means and Standard Deviations and Differential Item Functioning of Items from the Center for Epidemiological Studies – Depression Scale between Women with High and Low Acculturation to the United States

Subscale and Item	High			Low			Uniform DIF			Non-uniform DIF		
	M	SD		M	SD		χ^2	p	ΔR^2	χ^2	p	ΔR^2
Depressed Affect												
3 Blues	0.79	0.99	0.86	1.05	1.05		1.05	0.09	0.2%	0.91	0.34	0.1%
6 Depressed	1.09	1.09	1.04	1.02	1.02		0.23	0.63	0.0%	1.70	0.19	0.1%
9 Failure	0.45	0.85	0.41	0.79	0.01		0.01	0.92	0.0%	0.26	0.61	0.0%
10 Fearful	0.92	1.02	0.82	0.94	1.13		0.13	0.29	0.1%	1.47	0.23	0.2%
14 Lonely	0.95	1.07	0.97	1.03	0.35		0.35	0.55	0.1%	0.30	0.58	0.0%
17 Crying spells	0.98	1.05	1.06	1.01	2.36		0.12	0.12	0.3%	0.84	0.36	0.1%
18 Sad	1.12	1.05	1.15	0.95	1.58		0.21	0.1%	0.1%	2.50	0.11	0.2%
Somatic Activity												
1 Bothered	0.88	1.02	0.83	0.95	0.10		0.10	0.75	0.0%	0.42	0.51	0.1%
2 Appetite	0.75	0.99	0.66	0.86	0.14		0.14	0.71	0.0%	0.26	0.61	0.1%
5 Trouble	1.07	1.07	0.94	1.00	1.83		0.18	0.18	0.2%	1.28	0.26	0.2%
7 Effort	1.18	1.17	0.95	1.03	3.07		0.08	0.3%	0.3%	0.35	0.55	0.1%
11 Sleep	1.24	1.05	1.11	1.07	1.47		0.23	0.1%	0.1%	2.01	0.16	0.3%
13 Talked less	0.76	0.92	0.78	0.94	0.04		0.04	0.85	0.0%	0.20	0.66	0.0%
20 Get going	0.90	1.00	0.82	0.93	0.99		0.32	0.32	0.1%	0.34	0.56	0.0%
Interpersonal Problems												
15 Unfriendly	0.41	0.70	0.56	0.81	6.07		0.01	0.01	1.1%	0.05	0.82	0.0%
19 Disliked	0.43	0.78	0.45	0.78	1.16		1.16	0.28	0.1%	0.35	0.55	0.1%
Positive Affect												
4 Good (reverse)	0.60	1.00	0.50	0.89	1.06		1.06	0.30	0.2%	4.15	0.04	0.7%
8 Hopeful (reverse)	0.63	0.87	0.53	0.83	0.86		0.86	0.35	0.2%	0.01	0.91	0.0%
12 Happy (reverse)	0.66	0.90	0.75	0.88	6.04		0.01	0.01	0.6%	2.18	0.14	0.3%
16 Enjoyed (reverse)	0.67	0.98	0.68	0.94	0.88		0.88	0.35	0.1%	0.68	0.41	0.0%

Note. **Bold** indicates differences at $p < .05$.