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The Depression Anxiety Stress Scale-21: Spanish Translation and Validation With a Hispanic Sample

Patricia Daza,[1,2,5] Diane M. Novy,[3,4] Melinda A. Stanley,[4] and Patricia Averill[4]

The English-language version of the Depression Anxiety Stress Scale-21 (DASS-21) was professionally translated into Spanish and field-tested among 98 bilingual Hispanic adults. Participants who were diagnosed with an anxiety disorder on the Anxiety Disorders Interview Schedule-IV completed the DASS-21, the Beck Depression Inventory-II, and the Beck Anxiety Inventory. Results indicated strong indices of internal consistency and expected patterns of discriminant, convergent, and structural validity. A confirmatory factor analysis compared a model fit of a first order 1-factor model, a first order 3-factor model, and a second order factor model. The latter 2 models were significantly better than the 1-factor model. Psychometric data were comparable to those of an English version. Clinicians and researchers in need of a brief, Spanish-language, screening measure of general psychopathology may want to consider this newly translated DASS-21.

KEY WORDS: anxiety; depression; stress; Spanish; assessment.

The Hispanic population is currently the largest minority group in the United States and is projected to constitute 25% of the population in 2050. This will represent approximately 97 million people (Mezzich, Ruiz, & Muñoz, 1999; Salmán, Diamond, Jusino, Sánchez-LaCay, & Liebowitz, 1997; United States Department of Health and Human Services [USDHHS], 2001; U.S. Census Bureau, 2001a; Woodward, Dwinell, & Arons, 1992). The Hispanic population grew by 58% from 1990 to 2000. Approximately half of all Hispanic individuals live in the states of Texas and California. One third of the state of Texas is Hispanic (U.S. Census Bureau, 2001b). Although many Hispanics are bilingual, a significant number report being monolingual (only Spanish-speaking). In 1990, 40% of Hispanic individuals reported either speaking no English or not speaking it well (U.S. Census Bureau, 1990). Of those who are bilingual, many report Spanish as being their primary or preferred language. Yet, there is a paucity of Spanish-speaking psychologists and of valid diagnostic tools in Spanish (Ginzberg, 1991).

Epidemiological evidence indicates anxiety and related psychopathology are prevalent disorders among Hispanics (Burnam, Hough, Karno, Escobar, & Telles, 1987; Hoppe, Leon, & Realini, 1998; Karno et al., 1987, 1989; Roberts, 1981). Burnam et al. (1987) reported lifetime prevalence rates among Mexican Americans of 5.3% for major depression, 4.1% for dysthymia, 11.1% for phobias, 1.6% for panic disorder, and 1.6% for obsessive–compulsive disorder. One study even found Mexican American women to have higher prevalence rates of dysthymia, panic disorder, and phobia than non-Hispanic White women of similar age (Karno et al., 1987). Most studies have found that the United States-born Mexican Americans have higher prevalence rates than do native-born Mexican Americans (Burnam et al., 1987; Kessler et al., 1994). This lower prevalence rate among native-born Mexican Americans was also found in the most recent epidemiological study. Mexican American immigrants were

[1]Department of Clinical Psychology, University of Houston, Calhoun, Houston, Texas.
[2]Present address: Department of Behavioral Sciences, MD Anderson Cancer Center, University of Texas, Texas.
[3]Department of Anesthesiology, University of Texas – Houston Medical Center, Fannin, Houston, Texas.
[4]Department of Psychiatry and Behavioral Sciences, University of Texas – Houston Health Sciences Center, Moursund, Houston, Texas.
[5]To whom correspondence should be addressed at Department of Behavioral Sciences, University of Texas, MD Anderson Cancer Center, 1515 Holcombe Blvd., Box 243, Houston, Texas 77030; e-mail: pdaza@mdanderson.org.

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found to have lower rates of lifetime disorders than the United States-born Mexican Americans (Mexican American Prevalence and Services Study [MAPSS]; Vega et al., 1998) and lower rates than those reported in the National Comorbidity Study (NCS; Kessler et al., 1994). Potential reasons cited for the differences in prevalence rates reported in the NCS (Kessler et al., 1994) were the MAPSS's inclusion of interviews conducted in Spanish and the MAPSS's use of a more homogenous sample (i.e., adults of Mexican descent). The NCS did not include Spanish-language interviews. The exclusion of Spanish-speaking participants likely eliminated a section of the Hispanic population with the lowest prevalence rates of *DSM-III-R* diagnoses (USDHHS, 2001).

Research indicates Hispanics are less likely to seek psychological services than other cultural groups (Griffith & Villavicencio, 1985; Mezzich et al., 1999; Roberts, 1981; Rodriguez, 1987; Salmán et al., 1997; Vega, Kolody, Aguilar-Gaxiola, & Catalano, 1999). When Hispanic people do seek services, they often are faced with barriers (Malgady & Constantino, 1998). One potential barrier is the shortage of Spanish-speaking clinicians for clients who are Spanish-speaking only or for those who choose Spanish as their preferred language (Bernal & Castro, 1994). Barrera (1978) and Poma (1983) report this underutilization is likely due to the scarcity of bilingual/bicultural therapists. A recent survey of licensed psychology members of the American Psychological Association found that only 1% of their members identified themselves as Hispanic (Williams & Kohut, 1999). Evidence indicates dropout rates for Mexican Americans decrease when there are services available in Spanish (O'Sullivan & Lasso, 1992; Rogler, Malgady, Constantino, & Blumenthal, 1987; Sue, Fujino, Hu, & Takeuchi, 1991). The dearth of bilingual therapists (Ginzberg, 1991) is particularly problematic as research indicates bilingual clients whose native language is Spanish are likely to be rated differently when interviews are conducted in English versus Spanish (Cheung & Snowden, 1990; Malgady & Constantino, 1998; Marcos, Urcuyo, Kesselman, & Alpert, 1973).

Given the diversity of the population, there is a growing interest in the development of Spanish-language measures and a need to validate them with appropriate clinical samples (Masten, Caldwell-Colbert, Alcala, & Mijares, 1986; Rogler, 1989; Rogler et al., 1983). Additionally, laws are requiring equal access to appropriate and well-validated treatment for all populations (State of California, 1979). Accurate assessment of symptomatology is necessary before appropriate treatment plans can be designed and implemented. Thus, the development and field-testing of Spanish-language measures of psychological symptomatology are seen as important endeavors (Canales, Ganz, & Coscarelli, 1995; Roberts, 1981). Spanish-language measures that are found to be reliable and valid will likely facilitate the ability to provide effective care to a largely underserved group. Although current methods of assessing general affective distress among Hispanics rely on the use of measures developed for English-speaking individuals, this practice is seriously questioned given these instruments have not been normed on an appropriate sample (Kinzie & Manson, 1987; Masten et al., 1986; Solis & Abidin, 1991).

There are numerous self-report scales of affective distress, but none have been designed to measure depression, anxiety, and stress in one instrument. The Depression Anxiety Stress Scale (DASS; S. H. Lovibond & P. F. Lovibond, 1995) was developed for this purpose. A shorter version of the DASS (42-item), the DASS-21, was developed for those situations where a brief screening was desired. Findings from factor analytic studies with clinical and normal samples have supported a three-factor structure representing the three scales, although they were moderately correlated with each other. Results also indicated strong indices of internal consistency (Antony, Bieling, Cox, Enns, & Swinson, 1998; Brown, Chorpita, Korotitsch, & Barlow, 1997; Clara, Cox, & Enns, 2001; P. F. Lovibond & S. H. Lovibond, 1995; S. H. Lovibond & P. F. Lovibond, 1995). Only two studies to date have analyzed the factor structure and psychometric properties of this shorter version (Antony et al., 1998; Clara et al., 2001). Both exploratory (Antony et al., 1998) and confirmatory factor analyses (Clara et al., 2001) yielded a first order three-factor structure. Coefficient alphas of .94 (Depression scale), .87 (Anxiety scale), and .91 (Stress scale) were found in the Antony et al. (1998) study, and coefficient alphas of .92 (Depression scale), .81 (Anxiety scale), and .88 (Stress scale) were found in the Clara et al. (2001) study. Because the DASS-21 has never been available in Spanish, no psychometric properties or factor structures exist for this Spanish-language measure.

The purpose of this study was to translate and validate a brief measure of general affective distress with a well-diagnosed Hispanic sample. The psychometric adequacy and factor structure of the Spanish version of the DASS-21 were then compared to the English version on the basis of the existing literature (Antony et al., 1998; Clara et al., 2001). It was hypothesized that items of each of the three subscales of a Spanish-version DASS-21 would show comparable homogeneity to values reported for the 42-item and 21-item English versions; the Beck Anxiety Inventory (BAI) would be more strongly correlated with the Anxiety subscale of the DASS-21 than with the Depression subscale of the DASS-21; and lastly, the

Beck Depression Inventory (BDI) would be more strongly correlated with the Depression subscale of the DASS-21 than with the Anxiety subscale of the DASS-21. Hypothesized findings would support evidence of internal consistency and convergent and divergent validity.

Because the DASS-21 was originally designed to highlight three factors (P. F. Lovibond & S. H. Lovibond, 1995), it was expected that a confirmatory factor analysis of the Spanish version would also support a three-factor structure. Structural equation model comparisons were used to assess the degree to which a one-factor, three-factor, or second order factor model was more appropriate. It was anticipated that the three-factor and second order factor model would best explain the data, given the expectation that the instrument was not solely a measure of general affective distress (i.e., one-factor model).

METHOD

Participants

Participants were 98 bilingual (fluent in English and Spanish) adults; 78 were women and 20 were men. All participants were residing in the greater Houston, Texas, area at the time of the study. Participants ranged in age from 18 to 75. Average age was 40 years ($SD = 13.33$). Average income was $2,276.60 per month ($SD = $2,149.31), and average number of years of education was 14 ($SD = 2.86$). Forty-eight percent of the participants was born in the United States, 27% in Mexico, 13% in South America, and 7% in Central America. Other participants were born in Cuba, Puerto Rico, or other Latin American countries. Forty-three percent of the participants was married and 57% was composed of individuals who classified themselves as single, divorced, widowed, or living together. Forty percent of the participants spoke English at home, whereas 48% spoke Spanish. Twelve percent spoke both English and Spanish at home. Lastly, the majority of the participants' parents were born either in the United States or in Mexico.

This research study was part of a broader based project aimed at translating and validating a number of questionnaires measuring anxiety and related psychopathology (Novy, Stanley, Averill, & Daza, 2001). Participants responded to advertisements in newspapers and posted flyers. The ad called for eligible participants who were bilingual (be able to read in English and Spanish), experiencing some type of anxiety or worry, and aged 18 or older. Advertisements also stated participants would be paid $40 for their participation in the project. To qualify for the study, participants were required to have a principal diagnosis of one or more of the *DSM-IV* anxiety disorders. The Anxiety Disorders Interview Schedule-IV (ADIS-IV; Brown, Di Nardo, & Barlow, 1994) was used to assess diagnoses. Participants completed the ADIS-IV in English. There is no Spanish version to date. The ADIS-IV is a widely used structured interview designed to evaluate current *DSM-IV* diagnoses of anxiety and allows differential diagnoses among the anxiety disorders. The ADIS-IV also assesses mood, substance use, and somatoform disorders because these disorders have been found to have high comorbidity with the anxiety disorders (Di Nardo & Barlow, 1990). In addition to anxiety and mood disorders, this structured interview contains a brief screening for psychoses. The ADIS-IV is designed to follow *DSM-IV* guidelines for diagnosis. The diagnoses are rated on a scale from 0 (*no disorder*) to 8 (*very severe disorder*). Only participants with a rating of 4 (*moderate disorder*) or higher on the anxiety disorders were included in the study.

Principal diagnoses were as follows: generalized anxiety disorder ($n = 77$), panic disorder with or without agoraphobia ($n = 7$), social phobia ($n = 9$), obsessive–compulsive disorder ($n = 2$), specific phobia ($n = 2$), and posttraumatic stress disorder ($n = 1$). Coexisting diagnoses were as follows: generalized anxiety disorder ($n = 9$), panic disorder ($n = 4$), social phobia ($n = 9$), obsessive–compulsive disorder ($n = 1$), specific phobia ($n = 10$), major depression ($n = 13$), dysthymia ($n = 11$), and hypochondriasis ($n = 2$).

Measures

Anxiety Disorders Interview Schedule-IV (Brown et al., 1994)

The ADIS-IV is a structured interview designed to evaluate current *DSM-IV* diagnoses of anxiety and allows differential diagnoses among the anxiety disorders (Brown et al., 1994). Although there are no psychometric properties for the ADIS-IV to date, previous editions (e.g., ADIS, ADIS-R) have shown good diagnostic agreements with kappas ranging from .60 to .90 (Di Nardo, O'Brien, Barlow, Waddell, & Blanchard, 1983). In addition, test-retest reliabilities of .57–.82 were found for the anxiety disorders when using the ADIS-R (Di Nardo, Moras, Barlow, Rapee, & Brown, 1993).

Depression, Anxiety, and Stress Scale (DASS-21; S. H. Lovibond & P. F. Lovibond, 1995)

The DASS-21 is a shorter version of the original scale, the DASS. The DASS was initially normed on

950 first-year students at a university in Australia (S. H. Lovibond & P. F. Lovibond, 1995). The DASS also has been normed with a clinical sample and found to have strong psychometric properties (Brown et al., 1997). Exploratory factor analyses yielded a first order three-factor structure in both clinical and normal samples (Brown et al., 1997; P. F. Lovibond & S. H. Lovibond, 1995). In these studies, zero-order correlations among the three factors were Depression/Anxiety = .38−.51; Anxiety/Stress = .46−.65; Depression/Stress = .54−.64. The high intercorrelations among the factors suggested a higher order factor was present. It was labeled "general affective distress" (P. F. Lovibond & S. H. Lovibond, 1995; S. H. Lovibond & P. F. Lovibond, 1995). Although scales and factors were moderately correlated, evidence of convergent and divergent validity was also found. The BDI-II was found to correlate highly with the Depression scale ($r = .74$), and the BAI was found to correlate highly with the Anxiety Scale ($r = .81$; P. F. Lovibond & S. H. Lovibond, 1995; S. H. Lovibond & P. F. Lovibond, 1995).

The DASS-21 is the brief version of the DASS (originally 42 items). It is a dimensional, self-report scale that was designed to measure the negative emotional states of depression, anxiety, and stress. Each of the three scales contains seven items designed to assess the scale of interest. Scores for the three scales are calculated by aggregating the scores for the relevant items. Responses are rated on a 4-point scale. Participants are asked to endorse how much the item applied to them over the past week. Two studies have analyzed the psychometric properties for this brief version. Results indicated high coefficient alphas for each of the scales (Antony et al., 1998; Clara et al., 2001). Only one of the studies analyzed convergent and divergent validity and found support for each (Antony et al., 1998).

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996)

The BDI-II is the most commonly used self-report depression scale (Gotlib & Cane, 1989). It consists of 21 items that are rated on a scale of 0–3, with 3 indicating *more frequency and/or severity*. Participants rate the symptoms that have occurred in the past 2 weeks. The BDI-II has been found to be valid with psychiatric outpatients (Beck, Steer, & Brown, 1996; Steer, Ranieri, Beck, & Clark, 1993), college students (Beck et al., 1996), chronic pain patients (Novy, Nelson, Berry, & Averill, 1995), and Mexican Americans (Gatewood-Colwell, Kaczmarek, & Ames, 1989; Suárez-Mendoza, Cardiel, Caballero-Uribe, Ortega-Soto, & Márquez-Marín, 1997). A Spanish-language version also has been found to be valid with individuals from Argentina (Bonicatto, Dew, & Soria, 1998).

Beck Anxiety Inventory (Beck & Steer, 1990)

The BAI is a 21-item self-report measure designed to assess anxiety. Each item has a 4-point Severity scale (e.g., *not at all*, *mildly*, *moderately*, and *severely*) that addresses symptoms experienced during the past week. The internal consistency of the BAI has been found to range from .85 to .94 (Beck & Steer, 1990) and has been found to have adequate convergent and divergent validity (Fydrich, Dowdall, & Chambless, 1992).

Translation of the DASS-21

Standard steps outlined in the psychology and sociology literature guided the translation process used in this study (e.g., Chapman & Carter, 1979). Three professional translators, each of whom was accredited by the American Translator Association in English and Spanish languages, were hired to help with the translation process. Each translator worked independently and completed three steps. The first step involved the initial translation from English into Spanish. The second step involved editing and making needed modifications to the Spanish version. Idiomatic Spanish at the sixth-grade level was used for Steps 1 and 2. This was accomplished by using a sixth-grade word list developed by the secretary of public education in Mexico (Secretaria de Educación Pública, México, 1982). The third step involved back translation. The back translation of the Spanish version was made to improve the cultural equivalence of the measure and not produce simple word-for-word equivalence (Ardila, 2000; Werner & Campbell, 1970).

Once the back translation of the Spanish-language version was found to be acceptable, a lay panel was organized to review the measure. Lay panels often are not used in translation procedures because of the additional time and effort involved; however, this additional step was included. The lay panel comprised nine bilingual individuals from the community. These individuals represented various Hispanic nationalities and adult age groups (e.g., Mexico, South America). They were recruited from personal connections to the first author and selected because of their bilingual abilities, age, and cultural mix. Lay panel members met for three separate occasions averaging 2–3 hr each session. A $10 contribution per hour was given to each lay panel member. The panel's agenda was to ensure the Spanish-language translation was composed

of words or phrases that were common to the different Spanish dialects (Novy, Rintala, & Garza, 1998). The lay panel also assessed the measure to avoid any colloquialisms, slang, and esoteric phrases that would make interpretations difficult.

The final step in the translation process involved pilot-testing each measure on a group of Hispanic undergraduate college students, each of whom was bilingual. Fourteen students from a public university, the large majority of whom were Mexican American, responded to a posted notice of this activity and received extra credit for a psychology course. After the first author assessed the students' Spanish-language fluency and literacy by having them read and converse in Spanish, they were asked to review the measures and identify those words that were not easily understood. Words were changed if a consensus among the students and the first author indicated a better word should be selected.

Procedure

Participant recruitment was from public service announcements to various newspapers (in English and Spanish), community agencies, churches, mental health services, hospitals, and radio and television stations. Mailers to these organizations were sent out every 3 months for a period of 1 year. Over half of the sample was recruited from notices in the newspaper (62%). Interested responders who called about the study were told that participants would be paid $20 for a diagnostic interview (i.e., ADIS-IV) and $20 for completion of the paper-and-pencil measures. Parking expenses also were covered. Participants also were informed about the purpose of the study and the time commitment involved (i.e., approximately 2–3 hr to complete the ADIS-IV and the measures in English and Spanish). Following these explanations, interested participants underwent a 15-min telephone screening to assess eligibility criteria. Specifically, the screening was used to probe essential symptoms of each disorder and assess comprehension abilities in both languages. A formal language comprehension-screening test was not used.

On the basis of the telephone screen, 75 participants did not qualify for the study. Participants either did not appear to meet the criteria for an anxiety disorder, or their English and/or Spanish not adequate. The remaining 125 interested participants were invited to an outpatient clinic affiliated with a large medical school in Houston. Twenty-five of the individuals did not keep their appointment. Ninety-eight of the remaining potential 100 participants met the criteria for at least one ADIS-IV anxiety disorder with a moderate or higher ($\geq$4) severity rating. A licensed psychologist with extensive experience with the ADIS-IV (4th author) performed fidelity checks on 10% of the interviews. Exclusionary criteria included an alternative primary psychiatric diagnosis; evidence of psychotic symptoms, organic brain disorders, alcohol or other substance abuse within the past year; significant cognitive impairment; or any medical conditions that may have accounted for the anxiety symptoms.

Participants then completed the paper-and-pencil measures. The measures were arranged in separate language-version packets. Participants did not have access to the two language-version packets at any time. The order of presentation was counterbalanced. Near the end of the data collection, it was discovered that the incorrect form of the DASS-21 (English version) had been placed in the packets. Analyses involving the English version of the DASS-21 were subsequently dropped. Psychometric comparisons were made with published data on the English-version DASS-21 (Antony et al., 1998; Clara et al., 2001). Following the completion of the paper-and-pencil measures, participants were offered treatment referrals, if necessary, and were given brief information about potential types of therapy for anxiety and depression.

RESULTS

As expected, coefficient alphas for the newly developed Spanish version of the DASS-21 were strong. The total scale of the DASS-21 had a coefficient alpha of .96. Subscale coefficient alphas also were high ($\alpha_{\text{depression}} = .93$; $\alpha_{\text{anxiety}} = .86$; $\alpha_{\text{stress}} = .91$). These findings were comparable with previous research on the English version of the DASS-21 (Antony et al., 1998; Clara et al., 2001). Means, standard deviations, item-scale correlations, and item-total correlations are listed in Table I. The Anxiety subscale of the DASS-21 was significantly correlated with the Depression subscale of the DASS-21 ($r = .71$, $p < .01$), the Stress subscale of the DASS-21 ($r = .73$, $p < .01$), the BAI ($r = .82$, $p < .01$), and the BDI ($r = .62$, $p < .01$). The Depression subscale of the DASS-21 was significantly correlated with the Stress subscale of the DASS-21 ($r = .79$, $p < .01$), the BAI ($r = .60$, $p < .01$), and the BDI ($r = .86$, $p < .01$). The Stress subscale of the DASS-21 was significantly correlated with the BAI ($r = .62$, $p < .01$) and the BDI ($r = .74$, $p < .01$). Finally, the BAI and the BDI were significantly correlated ($r = .60$, $p < .01$). Despite the fact the DASS-21, the BDI, and the BAI were highly intercorrelated, convergent and divergent validity were supported. The correlation between the Anxiety subscale of the DASS-21 and the BAI ($r = .82$, $p < .01$) was significantly stronger in magnitude than the correlation between the Anxiety

Table I. Means, Standard Deviations, Item-Scale Correlations, and Item-Total Correlations for the Depression, Anxiety, and Stress Subscales of the Depression Anxiety Stress Scale-21 ($n = 98$)

	M	*SD*	Item scale	Item total
Depression subscale				
3. No podía sentir ningún sentimiento positivo	1.30	1.04	.74	.76
5. Se me hizo difícil tomar la iniciativa para hacer cosas	1.56	1.08	.63	.60
10. Sentí que no tenia nada por que vivir	1.04	1.02	.78	.79
13. Me sentí triste y deprimido	1.69	1.12	.83	.78
16. No me pude entusiasmar por nada	1.23	1.05	.81	.79
17. Sentí que valía muy poco como persona	1.07	1.13	.83	.74
21. Sentí que la vida no tenía ningún sentido	0.94	1.01	.81	.76
Anxiety subscale				
2. Me di cuenta que tenia la boca seca	1.01	0.97	.40	.46
4. Se me hizo difícil respirar	1.01	1.06	.66	.62
7. Sentí que mis manos temblaban	0.78	0.86	.53	.52
9. Estaba preocupado por situaciones en las cuales podia tener pánico o en las que podría hacer el ridículo	1.34	1.08	.64	.65
15. Sentí que estaba al punto de pánico	1.18	1.11	.78	.74
19. Sentí los latidos de mi corazón a pesar de no haber hecho ningún esfuerzo fisico	0.91	1.03	.68	.57
20. Tuve miedo sin razón	1.06	1.05	.75	.75
Stress subscale				
1. Me costó mucho relajarme	1.71	1.02	.90	.68
6. Reaccioné exageradamente en ciertas situaciones	1.55	1.09	.90	.70
8. Sentí que tenia muchos nervios	1.57	1.09	.90	.67
11. Noté que me agitaba	1.43	1.06	.90	.73
12. Se me hizo difícil relajarme	1.79	1.01	.89	.74
14. No toleré nada que no me permitiera continuar con lo que estaba haciendo	1.11	0.99	.90	.77
18. Sentí que estaba muy irritable	1.55	1.09	.90	.74

subscale of the DASS-21 and the BDI ($r = .60$, $p < .01$), Hotelling's $t(95) = 4.81$, $p < .05$. Further, the correlation between the Depression subscale of the DASS-21 and the BDI ($r = .86$, $p < .01$) was significantly stronger in magnitude than the correlation between the Depression subscale of the DASS-21 and the BAI ($r = .62$, $p < .01$), Hotelling's $t(95) = 5.78$, $p < .05$.

Table II. Depression Anxiety Stress Scale-21: Comparison of the Different Factor Models ($n = 98$)

No. of factors	No. of items	χ^2	*df*	RMSEA	NFI	NNFI	PNFI
1 factor	21	457.71	189	.12	.73	.80	.65
3 factor	21	328.99	186	.09	.80	.89	.71
2nd order	21	333.90	186	.09	.80	.89	.72

Note. *df* = degrees of freedom; RMSEA = root mean squared error of approximation; NFI = Normed Fit Index; NNFI = Normed Noncentrality Fit Index; PNFI = Parsimony Normal Fit Index.

To assess additional evidence of construct validity, the structural validity of the DASS-21 was analyzed. Three models were compared: a single first order factor model that comprised all the items; a first order three-factor model representing depression, anxiety, and stress factors; and a single second order factor underlying the three first order factors (see Fig. 1 for representations of the models). Items were assigned to factors on the basis of the DASS manual (S. H. Lovibond & P. F. Lovibond, 1995). Fit indices for these three models were derived by the AMOS software package (Arbuckle, 1997) and were used to compare model fit. Fit indices for the separate models are listed in Table II.

The first model assessed was a one-factor model where all the items were fixed to load on one factor: general affective distress. This one-factor model was associated with $\chi^2(189, N = 98) = 457.71$, and fit indices were as follows: Root Mean Square Error of Approximation (RMSEA) = .12, Normed Fit Index (NFI) = .73, Normed Noncentrality Fit Index (NNFI) = .80, and Parsimony Normed Fit Index (PNFI) = .60. The RMSEA is often cited as one of the better descriptive fit indices because it is less affected by sample sizes than is chi-square (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Quintana & Maxwell, 1999). Browne and Cudeck (1992) suggest that an RMSEA value of .10 or higher indicates a poor fit. NFIs of .8 and .9 are generally considered good. Other fit indices (e.g., NFI, PNFI) are considered adequate the closer they approach 1.0 (Arbuckle, 1997). Factor loadings ranged from .46 to .82 and are listed in Table III.

The second model assessed was a first order three-factor model. The three factors were defined corresponding to the three DASS-21 subscales (i.e., Depression, Anxiety, and Stress). Items were selected to load on the appropriate scales according to the manual of the DASS (S. H. Lovibond & P. F. Lovibond, 1995). This first order three-factor model was associated with $\chi^2(186, N = 98) = 328.99$, and fit indices were as follows: RMSEA = .09, NFI = .80, NNFI = .89,

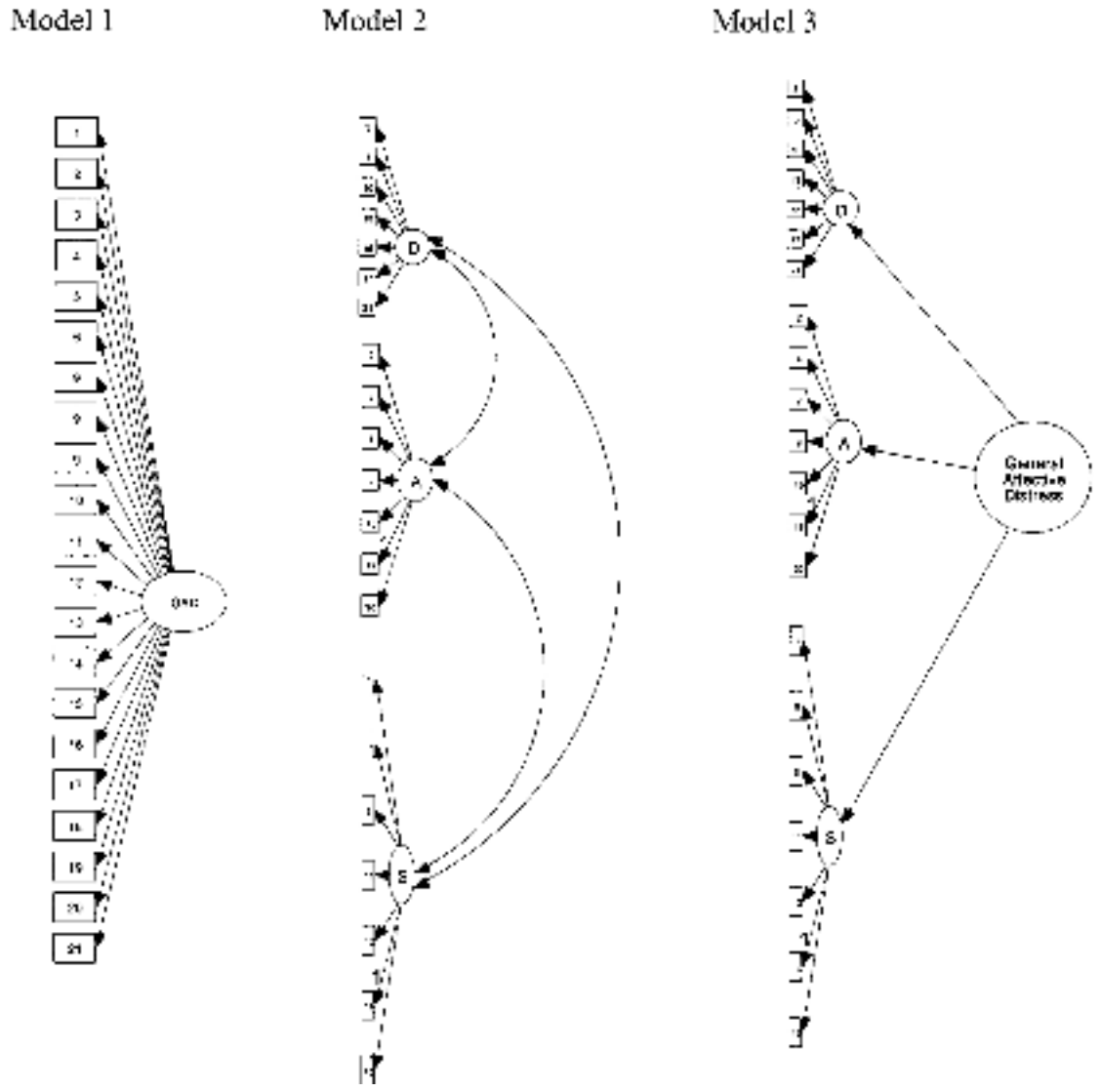

Fig. 1. Comparison of the models. Model 1 is the one-factor model, Model 2 is the first order three-factor model, and Model 3 is the second order three-factor model. GAD = general affective distress; D = depression; A = anxiety; S = stress.

and PNFI = .71. Factor loadings ranged from .44 to .84 and are listed in Table IV. The correlations among the factors were as follows: depression/anxiety = .79, depression/stress = .84, anxiety/stress = .80. The first order three-factor model provided a significantly better fit than the one-factor model, $\chi^2(3, N = 98) = 128.72$, $p < .01$, suggesting that the first order three-factor model more accurately fit the data. Both P. F. Lovibond and S. H. Lovibond (1995) and Brown et al. (1997) found that a first order three-factor model provided a significantly improved fit than a one-factor model; however, both these researchers used the DASS and not the DASS-21.

A final analysis assessed whether the variance in the three subscales was due to a higher order common factor. In other words, the high correlations between the depression, anxiety, and stress factors may have been the result of a construct (e.g., general affective distress) that underlies all of them and more clearly represents the variance with which they were associated. A second order factor analysis was conducted where the single second order factor influenced each of the first order factors. The model generated fit indices and item loadings that were nearly identical to the first order intercorrelated three-factor model, $\chi^2(188, N = 98) = 333.90$. Factor loadings ranged from .46 to .84. Fit indices were as follows: RMSEA = .09,

Table III. Factor Loadings for the First Order One-Factor Model

	One factor
Depression subscale	
3. No podía sentir ningún sentimiento positivo	.79
5. Se me hizo difícil tomar la iniciativa para hacer cosas	.64
10. Sentí que no tenia nada por que vivir	.81
13. Me sentí triste y deprimido	.82
16. No me pude entusiasmar por nada	.82
17. Sentí que valía muy poco como persona	.79
21. Sentí que la vida no tenia ningún sentido	.80
Anxiety subscale	
2. Me di cuenta que tenia la boca seca	.46
4. Se me hizo difícil respirar	.62
7. Sentí que mis manos temblaban	.52
9. Estaba preocupado por situaciones en las cuales podia tener pánico o en las que podría hacer el ridículo	.67
15. Sentí que estaba al punto de pánico	.74
19. Sentí los latidos de mi corazón a pesar de no haber hecho ningún esfuerzo fisico	.56
20. Tuve miedo sin razón	.75
Stress subscale	
1. Me costó mucho relajarme	.69
6. Reaccioné exageradamente en ciertas situaciones	.70
8. Sentí que tenia muchos nervios	.67
11. Noté que me agitaba	.74
12. Se me hizo difícil relajarme	.75
14. No toleré nada que no me permitiera continuar con lo que estaba haciendo	.79
18. Sentí que estaba muy irritable	.77

Note. All factor loadings were significant with critical ratios above 1.96.

Table IV. Factor Loadings for the First Order Three-Factor Model

	Depression	Anxiety	Stress
Depression subscale			
3. No podía sentir ningún sentimiento positivo	.78		
5. Se me hizo difícil tomar la iniciativa para hacer cosas	.65		
10. Sentí que no tenia nada por que vivir	.83		
13. Me sentí triste y deprimido	.85		
16. No me pude entusiasmar por nada	.85		
17. Sentí que valía muy poco como persona	.87		
21. Sentí que la vida no tenia ningún sentido	.86		
Anxiety subscale			
2. Me dí cuenta que tenia la boca seca		.44	
4. Se me hizo difícil respirar		.68	
7. Sentí que mis manos temblaban		.59	
9. Estaba preocupado por situaciones en las cuales podia tener pánico o en las que podría hacer el ridículo		.73	
15. Sentí que estaba al punto de pánico		.86	
19. Sentí los latidos de mi corazón a pesar de no haber hecho ningún esfuerzo fisico		.68	
20. Tuve miedo sin razón		.84	
Stress subscale			
1. Me costó mucho relajarme			.79
6. Reaccioné exageradamente en ciertas situaciones			.75
8. Sentí que tenia muchos nervios			.74
11. Noté que me agitaba			.77
12. Se me hizo difícil relajarme			.84
14. No toleré nada que no me permitiera continuar con lo que estaba haciendo			.75
18. Sentí que estaba muy irritable			.79

Note. All factor loadings were significant with critical ratios above 1.96.

NFI = .80, NNFI = .89, and PNFI = .72. The second order common factor accounted for 83% of the variance in depression, 75% of the variance in anxiety, and 84% of the variance in stress. P. F. Lovibond and S. H. Lovibond (1995) also found a second order model with fit indices and factor loadings that were identical to the first order three-factor model in their analysis of the DASS.

DISCUSSION

Ideally, psychometric indices of the Spanish version of the DASS-21 should be comparable to the English version of the DASS-21. Indices such as internal consistency, convergent and discriminant validity, and factor structure should be consistent across language versions. Results such as these would provide evidence of psychometric invariance between different language versions of a measure. This study provides such evidence. Specifically, data on the internal consistency of the Spanish-version DASS-21 indicated that alpha coefficients were acceptable and consistent with alpha coefficients of the English-version DASS-21. Convergent and discriminant validity were also supported by using well-established measures in the area of anxiety and depression (e.g., BDI-II and the BAI). Results from internal consistency (Antony et al., 1998; Clara et al., 2001) and convergent and discriminant validity analyses (Antony et al., 1998) replicated findings from the English version of the DASS-21. Finally, a model of three intercorrelated first order factors provided a good fit for the data from the Spanish version

of the DASS-21. These results corroborated findings with the English versions of both the DASS-21 (Antony et al., 1998; Clara et al., 2001) and the DASS (Brown et al., 1997; P. F. Lovibond & S. H. Lovibond, 1995a).

Of the two first order models tested, confirmatory factor analyses suggested that a three-factor model more clearly explained the data than did a one-factor model. Thus, there did appear to be homogenous item groupings that were consistent with the development of the scales. Because the three factors were highly correlated, a second order model of fit was tested to see whether the high intercorrelations were accounted for by a common higher order factor. Good fit of such a model would have shown strong support for the utility of a total score for the scale. Conceptually, this would have suggested an underlying framework of negative affectivity for constructs of depression, anxiety, and stress as proposed by some researchers (Brown, Chorpita, & Barlow, 1998). Data suggested the second order factor model provided a nearly identical fit to the first order intercorrelated three-factor model. A goal in factor analysis is to find the best model that will be parsimonious yet provide enough valuable information to allow discourse (Novy et al., 1995). Based on characteristics of parsimony, the three-factor model should be equivalent to the higher order factor model. However, the second order model allows discourse on two levels of the construct hierarchy that aids conceptual understanding.

There were several limitations in this study. One limitation was the small-sample size. It is often argued that confirmatory factor analyses should not be conducted with sample sizes smaller than 100 (Gorsuch, 1983). Larger samples are preferred given the precision of the covariance matrix increases as the sample size increases. Results that are more reliable will be obtained as the precision in the covariance matrix increases (Quintana & Maxwell, 1999). More recently, others have argued that accurate results are not solely the function of the number of participants or the number of variables. Rather, results also are a function of overdetermined factors (i.e., at least three to four items per construct), significant factor loadings, and adequate fit indices. It has been suggested that accurate estimates of population parameters can be obtained with samples as small as 100 as long as these previously stated good conditions are met (Fabrigar et al., 1999). Analyses with the DASS-21 met these requirements. In addition, this was the first study to date showing evidence of a three-factor structure for the Spanish version of the DASS-21. This was congruent with both a three-factor structure of the English version of the DASS-21 (Antony et al., 1998; Clara et al., 2001) and that of the DASS (Browne et al., 1997; P. F. Lovibond & S. H. Lovibond, 1995; S. H. Lovibond & P. F. Lovibond, 1995).

A second limitation was the large percentage of individuals diagnosed with a primary diagnosis of generalized anxiety disorder (GAD). Although an attempt was made to recruit individuals with different types of anxiety, 77% of the sample was diagnosed with GAD. This limitation precluded the ability to use the ADIS-IV as a grouping variable to assess validity. A related limitation is that the sample was composed only of individuals who met the criteria for an anxiety disorder. As stated earlier, this study was part of a larger study designed to translate and validate a series of anxiety questionnaires. The lack of individuals with depressive diagnoses limited the variability of responses on the measures and potentially limited the ability to fully assess validity. More importantly, it weakened the ability for this measure to be used as a screening instrument, given it was normed with a sample comprised mostly of individuals with anxiety disorders. A stronger test of the measure would have included individuals in the community with no diagnoses, diagnoses of depression, and other related disorders. It is possible that the dominance of anxiety in this sample likely influenced the higher interfactor correlations in the study. Therefore, caution is suggested in generalizing the results of this study to Hispanic participants that are largely composed of individuals with other principal diagnoses (e.g., obsessive–compulsive disorder, posttraumatic stress disorder, major depressive disorder).

Other study limitations were pertinent to participant characteristics. The requirements of responding to media advertisements in English and being fluent in English and Spanish likely influenced the education level of the sample. This sample was more educated than the Hispanic population currently residing in the United States (USDHHS, 2001). Additionally, bilingual participants were not assessed systematically with a standardized, formal-language measure. Thus, results may not generalize to individuals who are predominantly Spanish-speaking. Most of the sample and their parents were born in the United States or Mexico. Again, findings may be different in future studies, given the country of birth of the participant. Items may have slightly different meanings to people from two different countries (e.g., Puerto Rico vs. Mexico). Despite efforts to provide a methodologically sound translation process that all Spanish-speaking individuals could understand, it cannot be assumed that such a goal was achieved.

In spite of these limitations, this study adds importantly to the literature. The DASS-21 was translated by individuals who were accredited by the American Translator Association in English and Spanish languages. The translation process involved back translation, a contribution from a lay panel, and pilot-testing by bilingual students at a large university. This was a significant contribution,

because graduate students or authors of the measures are usually the translators of new language versions of measures that have been developed. Another strength was the use of a clinical sample that allows this measure to be generalized to other clinical samples similar to participants in this study. Although a more heterogenous sample would have more accurately tested this measure as a screening instrument, this study was a first step in assessing psychopathology in a Hispanic sample. Recommendations for future studies include replicating the psychometric data and factor structure among a larger, more broadly educated sample with different diagnoses, absence of diagnoses, and the inclusion of participants from different Latin countries. These characteristics, as well as a formal language assessment from the participants, would serve to strengthen and improve this study.

The development of a valid and reliable Spanish-language version of the DASS-21 is useful for assessment and therapeutic applications. The number of Hispanics in the United States continues to grow exponentially, and Hispanic mental health clients require service delivery appropriate to their language resources. Translations of English measures are insufficient for such uses and constitute only a first step. Spanish-language measures also require validation with appropriate clinical samples (Masten et al., 1986; Rogler et al., 1983). The Spanish version of the DASS-21 was professionally translated and validated with a Hispanic sample. It was developed so that the Spanish-speaking individuals would have a brief, screening measure of general psychopathology. Psychometric indices (e.g., coefficient alpha, convergent and discriminant validity) indicate data from this instrument are reliable and valid, given sample characteristics equivalent to those in this research project. It is hoped this newly translated measure will aid in both research and clinical endeavors with Hispanic individuals. Researchers and clinicians should continue to monitor and report the extent to which individuals understand the given items. The potential contribution of the Spanish version of the DASS-21 is to aid clinicians and researchers in a more accurate assessment of general psychopathology in Spanish. This study is a beginning step towards achieving that goal.

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