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Psychometric Evaluation of the Brief Acculturation Scale for Hispanics

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Abstract

This study examined the psychometric properties of the Brief Acculturation Scale for Hispanics (BASH), a four-item, language-based measure of acculturation. Participants in the study were 435 Hispanic Americans from a large metropolitan area with English or Spanish language preference. Internal consistency reliability was strong in both language-preference groups. Multiple-group confirmatory factor analysis was used to evaluate the structural validity of the measure. A unidimensional factor structure was found for both English and Spanish language-preference groups and items loaded equivalently across groups, demonstrating measurement invariance. The BASH had good convergent validity and incremental validity. Overall, this study provides further evidence that the BASH offers a brief, reliable, and valid measure of acculturation to be used among Hispanic Americans.

Keywords

acculturation; Hispanic Americans; measurement; multiple-group confirmatory factor analysis

There is little consensus on a definitive way to measure acculturation in Hispanics, despite the growing need and interest in the construct. Norris, Ford, and Bova (1996) created the Brief Acculturation Scale for Hispanics (BASH), a language-based questionnaire, in an effort to provide a concise and efficient acculturation measure for Hispanics. The four items were selected from the five-item Language Use subscale of the Short Acculturation Scale for Hispanics (SASH), developed by Marín, Sabogal, Marín, Otero-Sabogal, and Perez-Stable (1987). Norris et al. (1996) argued that the brief, language-based BASH overcomes many of the limitations of other available acculturation measures because it takes very little time to

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complete, is available in both English and Spanish, and can be used with all Hispanics, as opposed to measures developed for a particular Hispanic subgroup (Norris et al., 1996). Also, language has been shown to account for the greatest proportion of variance in acculturation, and has been suggested as the most reliable indicator of the construct (Marín et al., 1987; Norris et al., 1996). To date, the BASH has been used in numerous studies (e.g., Eldeirawi & Persky, 2006; Hsin, La Greca, Valenzuela, Moine, & Delamater, 2010; Unger & Molina, 1998, 2000), but its psychometric properties have not been thoroughly examined.

Norris et al. (1996) first evaluated the psychometric properties of BASH scores in a sample of low-income Mexican American and Puerto Rican adolescents and young adults. Internal consistency was strong for the total sample ($\alpha = .90$) and the two ethnic groups (Mexican American respondents, $\alpha = .92$; Puerto Rican respondents, $\alpha = .92$). Norris et al. also reported evidence for convergent, discriminative, criterion, and incremental validity of BASH scores. In other studies, the BASH has demonstrated good internal consistency reliability ($\alpha = .74$ to .89; Hsin et al., 2010; Unger & Molina, 1998, 2000), and some support has been found for convergent validity (Hsin et al., 2010; Unger & Molina, 2000).

While the BASH has generally demonstrated good psychometric properties (Norris et al., 1996; Unger & Molina, 1998, 2000), additional psychometric evaluation is warranted. Although both the Spanish and English language versions of the BASH have been used in research studies, to date no explicit test of the invariance of the dimensionality of the measure across language versions has been performed. In addition, further evaluation of convergent validity is needed for both language versions. Finally, Norris et al. (1996) identified incremental validity as a key advantage of the BASH. Incremental validity reflects whether a measure significantly contributes to the literature in a more useful, efficient, or accurate manner than existing measures (Hunsley & Meyer, 2003). Norris et al. argued that, compared with longer acculturation measures, the four-item BASH can measure acculturation much more efficiently. However, if the purpose of the BASH is to provide a brief measure of acculturation based solely on language, perhaps only one question about language preference is necessary, rather than four.

The overall aim of this study was to evaluate the psychometric properties of scores from the English and Spanish versions of the BASH in a Hispanic American community sample and to determine whether these properties were invariant across English and Spanish language-preference subgroups. Reliability (internal consistency) and validity (structural, convergent) were examined for the entire sample, as well as for language-preference subgroups. The study also investigated incremental validity by examining the relationship of BASH scores to a single-item indicator of language preference (i.e., respondents' stated language preference for study participation). In addition, correlations between the single-item indicator and all validity measures were evaluated to determine whether the single-item similarly discriminates among Hispanic Americans of different acculturation levels.

Method

Participants and Procedures

Participants were a community sample of 435 self-identified Hispanic American men and women (English language preference, *n* = 210, Spanish language preference, *n* = 225) from a large metropolitan area. Sample characteristics can be found in Table 1. To be eligible for inclusion, individuals must have self-identified as Hispanic American, been at least 21 years of age, been residents of the United States, and had sufficient literacy skills in English or Spanish to complete a survey packet in their preferred language. Eligible participants provided written informed consent and then completed the survey packet. The sponsoring universities' Institutional Review Boards approved all study procedures and materials.

Measures

Demographics—Demographic information was provided by participant self-report. Language preference was determined by the language in which participants elected to complete the survey packet.

Acculturation—The four-item BASH (Norris et al., 1996), described above, uses self-reported language use to indicate level of acculturation. The items ask about language use (1) while reading and speaking, (2) at home, (3) while thinking, and (4) with friends. Responses are given on a five-point scale: 1 = *only Spanish*, 2 = *more Spanish than English*, 3 = *both equally*, 4 = *more English than Spanish*, and 5 = *only English*. Scores range from 4 to 20, with higher scores indicating greater levels of acculturation.

The five-item Social Affiliation subscale of the Scale of Ethnic Experience (SEE; Malcarne, Chavira, Fernandez, & Liu, 2006) was used to measure social comfort with members of one's own ethnic group, versus other groups. Scores range from 1 to 5, with higher scores representing greater comfort with one's own ethnic group. In the present study, internal consistency reliability was acceptable for the total sample (α = .79) and for the English language-preference (α = .81) and Spanish language-preference groups (α = .75).

Data Analysis

Descriptive statistics were calculated separately for the language-preference groups. An independent-samples *t*-test was used to compare mean BASH scores across groups. Coefficient alpha was calculated for the total sample and separately for the two language-preference groups.

Multiple-group confirmatory factor analysis (CFA) was used to examine the goodness of fit of the unidimensional factor structure of the BASH, and to evaluate measurement invariance across language-preference groups. The four BASH items loaded (weight of .60 as a cutoff score) on a single "Language Use" factor when included in the longer SASH (Marín et al., 1987). Thus, the BASH items were expected to load onto a single factor in the present study.

Typically, there are three increasingly restrictive models that are iteratively examined as part of a multiple-group CFA: (1) configural invariance, (2) metric invariance, and (3) factor variance invariance. Multiplefit indices were jointly examined when assessing model fit.

Preliminary analyses revealed that the data were multivariately non-normal. Therefore, the Satorra-Bentler χ^2 (S-Bχ^2; Satorra & Bentler, 2001) was used when assessing model fit because the χ^2 maximum likelihood ratio may be inflated. In addition, the robust comparative fit index (CFI; Bentler, 1990), the standardized root mean square residual (SRMR; Hu & Bentler, 1999), and the root mean square error of approximation (RMSEA; Steiger, 1990) were used to assess model fit due to the sensitivity of the χ^2 statistic to sample size. CFI values >.90 were indicative of adequate model fit, and values >.95 were indicative of good model fit. SRMR and RMSEA values <.08 were indicative of adequate model fit, and values <.05 were indicative of good model fit. A model was determined to fit acceptably well if at least two of the three descriptive fit indices met the criteria for adequate model fit. The S-Bχ^2 difference test was used with scaling factors developed by Satorra and Bentler (2001) when comparing models. A significant test value of $p > .05$ was used to indicate that the models are not equivalent across English and Spanish language-preference groups.

Convergent validity was evaluated by examining the correlation of BASH total scores with number of years living in the United States, place of birth (United States vs. not United States), and scores on the SEE's Social Affiliation subscale. Incremental validity was evaluated by examining the correlation between the BASH total score and respondents' language-preference choice. Incremental validity was evaluated by examining correlations between participants' language-preference choice and all validity measures to determine whether the single-item representing language preference (i.e., stated preference for completing study questionnaires in English or Spanish) is a similarly valid but more efficient indicator of acculturation in comparison with the BASH.

Results

Sample Descriptives

Descriptive statistics can be found in Table 1. Means and standard deviations for each item in the BASH are listed in Table 2. Total scores for both language-preference groups ranged from 4 to 20. Mean BASH scores were significantly different between groups; as expected, the English language-preference group had significantly higher scores ($M = 14.23$, $SD = 3.72$) than the Spanish language-preference group ($M = 7.84$, $SD = 3.64$), $t(420) = 17.94$, $p < .001$.

Reliability

Internal consistency reliability was strong for the total sample ($\alpha = .94$), and for both language-preference groups (English $\alpha = .89$, Spanish $\alpha = .90$).

Structural Validity

First, configural invariance was examined through baseline CFAs of a one-factor solution run simultaneously in the English language-preference and Spanish language-preference groups. Results can be found in Table 3. Factor loadings were freely estimated, and no parameter estimates were constrained to equivalence across language-preference groups. The one-factor solution fit the data well, and all factor loadings for both language-preference

groups were significant. This provided evidence supporting the configural invariance of the one-factor model.

Next, factor loadings were constrained to equivalence across English and Spanish language-preference groups. The metric invariance model fit the data well, indicating that factor loadings were equivalent across groups. This constrained model was then compared with the less restrictive configural invariance model using the $\Delta S\text{-}B\chi^2$ test. Model fit was not compromised after adding equality constraints ($\Delta S\text{-}B\chi^2 = 2.71$, $df = 3$, $p = .44$).

Finally, factor variance equality constraints were added to the metric invariance model. The factor variance invariance model fit the data well, indicating that the English and Spanish language-preference groups had the same variability in BASH scores. The factor variance invariance model was compared with the metric invariance model, and the former was determined the best fit to the data ($\Delta S\text{-}B\chi^2 = 0.18$, $df = 1$, $p = .68$).

Convergent Validity

Because number of years lived in the United States was confounded with participant age, the respondent's length of residence was divided by their age to produce a more valid index. In the present study the residency index was strongly associated with BASH scores ($r = .70$, $p = .01$). Respondents born in the United States had significantly higher BASH scores ($M = 14.16$, $SD = 3.93$) in comparison with respondents born outside of the United States ($M = 8.92$, $SD = 4.19$), $t(353) = 12.04$, $p < .01$. There was a moderate significant negative correlation between BASH scores and scores on the Social Affiliation scale of the SEE ($r = -.29$, $p < .01$).

Incremental Validity

Incremental validity was evaluated via a point-biserial correlation of the BASH with respondents' language-preference choice. In addition, correlations between the single-item indicator and all validity measures were examined. There was a strong significant positive correlation between BASH scores and respondents' language preference ($r_{pb} = .66$, $p < .01$). As expected, higher BASH scores were associated with English language preference as opposed to Spanish language preference. The single-item language-preference indicator was strongly significantly associated with the residency index ($r = .54$, $p < .01$), strongly significantly associated with place of birth ($r = .50$, $p < .01$), and moderately significantly associated with Social Affiliation sub-scale scores ($r = -.29$, $p < .01$), in the expected directions.

Discussion

This study evaluated the reliability and validity of the BASH in a sample of Hispanic Americans with English or Spanish language preference living in a large metropolitan area. Support for the reliability of the BASH, as measured by Cronbach's coefficient alpha, was found. The coefficient alpha levels were strong, and similar between language-preference groups as well as to those reported in previous studies using the BASH (Norris et al., 1996; Unger & Molina, 1998; Wilkinson et al., 2009).

Results also demonstrated strong evidence of structural validity for the measure. The BASH demonstrated configural, metric, and factor variance invariance. The same unidimensional factor structure was found for both English language-preference and Spanish language-preference groups. Items loaded equivalently onto a single factor for both language groups. Furthermore, the variance in total BASH scores was equivalent across language-preference groups. The results of the multiple-group CFA suggest that the BASH measured the construct of acculturation equivalently across both language-preference groups.

Evidence of convergent validity was found, replicating results previously obtained by Norris et al. (1996). Respondents who had spent fewer years of their life in the United States or who were born outside the United States had significantly lower BASH scores in comparison with respondents with more years in the United States or who were born in the United States. Furthermore, lower acculturation as measured by the BASH was associated with preference for social interactions with one's own ethnic group, versus other groups.

The authors of the BASH have suggested that one advantage of the BASH over other acculturation measures is its brevity, thus enhancing its incremental validity (Norris et al., 1996). While the four-item BASH is indeed brief, we examined whether a single item about language preference might provide an even briefer, yet sufficient and similarly informative, language-based indicator of acculturation. Specifically, we examined whether this single item would be highly correlated with the BASH total score and similarly correlate with convergent validity measures. As expected, there was a strong association between language-preference choice and BASH score, indicating that higher acculturation was associated with English language preference as opposed to Spanish language preference. The strength of correlations between the single-item indicator and all convergent validity measures was similar to that found for the BASH. These findings suggest that the single-item indicator of language preference may provide an even briefer, yet similarly valid, language-based indicator of acculturation in comparison with the four-item BASH. Many studies are forced, due to concerns about participant burden, to rely on single-item indicators of constructs. These findings provide support for the use of this single item to provide a general language-based estimate of acculturation.

There are limitations to this study. Due to the location of the single metropolitan community in which the study was conducted, the convenience sample was primarily Mexican American. Future studies should examine the psychometric properties of BASH scores in other Hispanic American groups and in diverse geographic locations to evaluate the generalizability of the present study's findings. Nevertheless, there was a good range in acculturation scores in the present sample, and the Spanish language-preference group had significantly lower BASH scores in comparison with the English language-preference group, as expected. Also, despite being a convenience sample, participants were generally representative of the larger community in terms of the demographics assessed (U.S. Census Bureau, 2010).

In sum, this study provides additional evidence in support of the English and Spanish versions of the BASH as reliable and valid brief unidimensional measures of acculturation for Hispanic Americans with English language preference or Spanish language preference.

However, study findings also suggest that a single-item indicator of language preference may be an even more efficient, and similarly valid, unidimensional measure of acculturation.

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Biographies

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Rina S. Fox is a doctoral student at the SDSU/UCSD Joint Doctoral Program in Clinical Psychology, specializing in Behavioral Medicine. Her research interests include assessing mechanisms for coping with the stresses of chronic illness, diminishing cultural health disparities, and psychometrics.

Georgia Robins Sadler is a professor of surgery at the UCSD School of Medicine and the associate director for Community Outreach at the UCSD Moores Cancer Center. Her research focuses on developing ways to reduce health disparities. Working through community–campus partnerships, her research is focused on creating and evaluating cost-effective strategies for addressing health disparities within the African American, Asian American and Pacific Islander, Hispanic American, and Deaf communities. She received her BSN from the University of Pennsylvania, her MBA from Wharton Graduate School, and her PhD from the Union Institute and University. She did her postgraduate work at the University of London while a Thouron British–American Scholar.

Table 1

Sample Characteristics.

	English (*n* = 210)	Spanish (*n* = 225)
Age[a]	38.50 (13.74)	46.29 (13.38)
Gender[b]		
Female	107 (51.0%)	111 (49.3%)
Male	103 (49.0%)	114 (50.7%)
Education[b]		
Less than high school	13 (6.2%)	107 (47.5%)
High/trade school	39 (18.6%)	48 (21.3%)
Some college/Associates degree	81 (38.5%)	41 (18.2%)
Bachelor's degree	57 (27.1%)	17 (7.6%)
Postgraduate	18 (8.6%)	7 (3.1%)
Missing/don't know	2 (1.0%)	5 (2.2%)
Country of birth[b]		
United States	130 (62.5%)	31 (13.6%)
Mexico	52 (24.8%)	134 (59.0%)
Other	9 (4.5%)	4 (1.7%)
Missing/don't know	19 (8.2%)	56 (24.9%)

[a] *M* (*SD*).

[b] *n* (%).

Table 2

Means, Standard Deviations, and Unstandardized Factor Loadings From Baseline Models for English and Spanish Versions of the BASH.

	English (*n* = 210)		Spanish (*n* = 225)	
BASH item Language use…	**Factor loadings**	***M (SD)***	**Factor loadings**	***M (SD)***
1. While reading and speaking	1.00*	3.62 (0.86)	1.00*	2.26 (0.94)
2. At home	1.24*	3.32 (1.26)	1.12*	1.72 (1.02)
3. While thinking	1.33*	3.69 (1.14)	1.30*	1.88 (1.14)
4. With friends	1.20*	3.58 (1.04)	1.18*	2.00 (1.07)

Note. The factor loading for the first item was fixed to 1 to set the metric for the latent variable.

*$p < .05$.

Table 3

Fit Statistics for Configural Invariance, Metric Invariance, and Factor Variance Invariance Models of the BASH.

Model	S-Bχ^2	*df*	*p*	CFI[a]	SRMR[b]	RMSEA[b]	Reference Model No.	ΔS-Bχ^2	Δdf	Δp
1. Configural	9.846	7	<.001	.995	.027	.043				
2. Metric	11.753	10	<.001	.997	.034	.028	1	2.707	3	.439
3. Factor variance	11.928	11	<.001	.998	.035	.020	2	0.175	1	.676

Note. CFI = robust comparative fit index; SRMR = standardized root mean square residual; RMSEA = root mean squared error of approximation.

[a] Adequate fit >.90, good fit >.95.

[b] Adequate fit <.08, good fit <.05.