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Psychometric Evaluation of the Multidimensional Health Locus of Control Scales in English- and Spanish-Speaking Hispanic Americans

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Abstract

The English and Spanish versions of the Multidimensional Health Locus of Control (MHLC) scales have not been psychometrically evaluated for use with Hispanic Americans (HAs). HA adults ($N = 436$) completed the English ($n = 210$) or Spanish ($n = 226$) MHLC scales. A multiple-group confirmatory factor analysis (CFA) did not support equivalent four-factor structures for Spanish- and English-speaking HAs. Follow-up exploratory factor analyses of the 24 items supported an 18-item, four-factor structure for English-speaking HAs and a 22-item, three-factor structure for Spanish-speaking HAs. These results suggest caution when using the MHLC scales with HAs.

Keywords

Hispanic Americans; Health Locus of Control; Multidimensional Health Locus of Control scales; MHLC; Spanish

The Multidimensional Health Locus of Control scales (MHLC; Wallston et al., 1978; Wallston et al., 1999) have been widely used to demonstrate the importance of health cognitions as determinants of health outcomes and health behaviors (Luszczynska and

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Schwarzer, 2005; Wallston, 2005). The MHLC scales are designed to measure four substantially independent dimensions of health locus of control (HLC): internal, powerful others, chance, and God. The Internal Health Locus of Control (IHLC) scale measures an internal dimension in which health outcomes are the result of one's own volition. The Powerful Others Locus of Control (PHLC), Chance Health Locus of Control (CHLC), and God Locus of Health Control (GLHC) scales measure more external dimensions in which health outcomes are attributed to outside sources. In general, research has shown that more external health loci are associated with less healthy behaviors, while a more internal health locus is associated with more healthy behaviors (Ahmedani et al., 2013; Bundek et al., 1993; Omeje and Nebo, 2011).

Despite their frequent use in health psychology research, there is a dearth of knowledge about the psychometric properties of the MHLC scales for use with groups other than non-Hispanic Whites, and little is known about different language translations. In a special issue of the Journal of Health Psychology devoted to the MHLC, Wallston (2005) noted substantial evidence supporting the validity of the MHLC scales. However, Wallston cautioned that evidence for the MHLC scales' validity may vary across different contexts, and in this same issue, Luszczynska and Schwarzer (2005) advocated for the cross-cultural validation of the MHLC scales. In a recent review, LaNoue et al. (2015) stated that the original three-factor structure of the MHLC scales is inconsistent across diverse samples; for instance, they found that the original MHLC structure in non-Hispanic whites does not parallel the MHLC structure found in non-Hispanic Blacks. Most studies have examined the original MHLC scales, excluding the GLHC scale; one exception is Chaplin et al. (2001), who found support for all four scales in a diverse sample of Canadian women.

The MHLC scales need to be evaluated for use with Hispanic Americans (HAs) because HAs are the fastest growing minority group in the United States, projected to represent 28% of the United States population by 2060 (United States Census Bureau, 2018). Spanish translations of the MHLC scales also need psychometric evaluation, as recent statistics show that 72.4% of HAs older than five years of age spoke Spanish at home in 2016 (United States Census Bureau, 2018). Results from the few studies that have administered the English or Spanish versions of the MHLC scales to HA samples suggest that the MHLC scales may perform differently in this American subgroup. In his review, Wallston (2005) reported that Cronbach's alphas for the scales generally range from .60 to .75. However, Cronbach's alphas have ranged from .26 to .82 for samples of HA adults (see, for example, Bundek et al., 1993; Champagne et al., 2016; Fox et al., 2014; Malcarne et al., 2005; Mills et al., 2018; Murguia et al., 2000). Malcarne et al. (2005) were unable to confirm the three-factor structure of the original 18-item MHLC (containing the IHLC, PHLC, and CHLC scales) in a sample of 462 English-speaking HA college students. To date, there are no psychometric studies of the full 24-item MHLC scales with English-speaking HA community adults, and no psychometric studies of a Spanish version of the 24-item scales for Spanish-speaking HAs. Therefore, the aim of the present study was to evaluate the psychometric properties and measurement invariance of the 24-item MHLC scales for HAs with English or Spanish language-preference.

Methods

Participants and Procedures

Participants were 436 HA community adults (219 women, 217 men) recruited to a single-session descriptive study on community health who met eligibility criteria of: 1) 21 years of age or older, 2) lived in the United States, 3) self-identified as HA, and 4) had sufficient literacy in English or Spanish to complete written questionnaires. Recruitment was accomplished through a variety of community outreach strategies, including flyers and recruitment events (Sadler, Lee, Lim, and Fullerton, 2010). After giving informed consent, participants completed a survey packet in their preferred language of English or Spanish (210 chose to complete questionnaires in English, and 226 in Spanish). The survey packets contained the MHLC scales, along with other self-report instruments and a demographic survey; study participation including informed consent and debriefing took one to two hours. Each participant received $75 as a token of appreciation. The sponsoring universities' Institutional Review Boards approved all procedures and materials for human subjects' research prior to participant enrollment.

Measures

MHLC Scales.—Participants completed Form A of the original 18-item MHLC scales (Wallston et al., 1978) with the 6 GLHC items integrated (Wallston et al., 1999) in their preferred language of English or Spanish. Each scale (IHLC, PHLC, CHLC, GLHC) contains six items with a 6-point Likert response format (1 = *strongly disagree* to 6 = *strongly agree*). Total scores for each scale range from 6 to 36, with higher scores indicating more control for that health locus. The Spanish version of the original MHLC scales was obtained from the scales' author, K. Wallston. The Spanish translation of the GLHC items was created by the research team using accepted practices that included forward translation by a bilingual (English/Spanish) translation team representing multiple Spanish dialects, followed by back translation and reconciliation by a second team, and pilot testing with community members (Ercikan and Lyons-Thomas, 2013; Geisinger, 1994).

Demographic Survey.—Participants completed a demographic survey that assessed the following variables: age, gender, education level, employment status, marital status, country of birth, whether they had children, and religious preference.

Data Analysis

A series of independent samples t-tests and chi-squared tests were performed to examine differences in demographic characteristics and MHLC scale scores across language-preference groups. McDonald's omegas with confidence intervals (Dunn, Baguley and Brunsden, 2014) and Cronbach's coefficient alphas were calculated to assess the internal reliability of the English and Spanish MHLC scales.

Multiple-group confirmatory factor analysis (CFA) tested measurement invariance of the MHLC scales' 24-item, orthogonal, four-factor structure across language groups. It is recommended that models be assessed through a four-step, sequentially restrictive approach in which exploration of models stops when measurement invariance is no longer found

(Dimitrov, 2010). The four steps are (a) configural invariance, (b) metric invariance (weak measurement invariance), (c) scalar invariance (strong measurement invariance), and (d) factor variance invariance (structural invariance). The maximum likelihood robust estimation procedure employed by MPlus version 8 (Muthén and Muthén, 1998–2012) estimated model parameters in all CFAs. Because the data were multivariately non-normal, the Satorra-Bentler χ^2 (S-Bχ^2; Satorra and Bentler, 2001) statistically examined the goodness of fit of the MHLC's hypothesized factor structure. The robust comparative fit index (CFI; Bentler, 1990), the standardized root mean square residual (SRMR; Hu and Bentler, 1999), and the root mean square error of approximation (RMSEA; Steiger, 1990) descriptively evaluated the goodness of fit to compensate for the χ^2 statistic's sensitivity to sample size. CFI values greater than .90 indicate acceptable model fit, whereas values greater than .95 indicate good model fit. SRMR and RMSEA indicate acceptable model fit when their values are lower than .08 and good model fit when lower than .05.

If CFA did not support measurement invariance of the four-factor structure, follow-up principal axis factoring (PAF) analyses with varimax rotation were planned to explore the individual factor structures of the MHLC with data from each language-preference group. The best factor solution would be determined via parallel analysis and by evaluating the variance accounted for by each individual factor and the interpretability of factors.

Results

Sample Descriptives

The English language-preference group ($n = 210$) had a mean age of 38.5 ($SD = 13.74$), 51.0% were women, 56.7% had children, 24.8% had less than some college education, 67.1% were employed, 45.2% were married, and 62.4% were born in the United States. The Spanish language-preference group ($n = 226$) had a mean age of 46.24 ($SD = 13.37$), 49.6% were women, 61.9% had children, 69.0% had less than some college education, 46.5% were employed, 51.3% were married, and 13.7% were born in the United States.

Comparison Tests

HAs in the English language-preference group had higher levels of education ($\chi^2 = 114.806$, $df = 4$, $p < .001$, $\varphi = .517$); were younger ($t = 5.957$, $df = 433$, $p < .001$, Cohen's $d = .571$); were more likely to have been born in the United States ($\chi^2 = 99.522$, $df = 2$, $p < .001$, $\varphi = .524$); were more frequently employed at least part time ($\chi^2 = 27.085$, $df = 4$, $p < .001$, $\varphi = .255$); and were less likely to have a religious affiliation ($\chi^2 = 5.617$, $df = 1$, $p = .018$, $\varphi = .114$) than HAs in the Spanish language-preference group. In addition, the English language-preference group had higher IHLC scale scores ($M = 26.84$, SD = 4.97 vs. $M = 25.55$, $SD = 6.51$; $t = 2.311$, $df = 434$, $p = .021$, Cohen's $d = .222$), lower PHLC scale scores ($M = 19.12$, $SD = 5.01$ vs. $M = 23.42$, $SD = 6.04$; $t = 8.04$, $df = 434$, $p < .001$, Cohen's $d = .773$), and higher CHLC scale scores ($M = 16.15$, SD = 5.34 vs. $M = 14.98$, $SD = 6.57$; $t = 2.031$, $df = 434$, $p = .043$, Cohen's $d = .195$). No significant differences were found for GLHC scale scores.

Multiple-group CFA Models

First, configural invariance was tested by fitting a 24-item, orthogonal, four-factor solution to the data of the Spanish and English language-preference groups.[1] The results did not corroborate equivalent four-factor structures for the English language-preference group (S-Bχ^2 = 579.454, *df* = 252, $p < .001$, RMSEA = 0.079, SRMR = 0.118, CFI = 0.802) and the Spanish language-preference group (S-Bχ^2 = 759.866, *df* = 252, $p < .001$, RMSEA = 0.094, SRMR = 0.144, CFI = 0.656). The modification indices did not suggest any meaningful changes to improve model fit for either group. Therefore, multiple-group CFA was stopped at the configural invariance phase.

Exploratory Factor Analysis

English language-preference group.—PAF using varimax rotation[2] was conducted to explore the factor structure of the English version of the MHLC scales. Based on the variance accounted for by each individual factor and the interpretability of factors, it was determined that the MHLC's hypothesized four-factor solution best fit the data, but one IHLC item (1), two PHLC items (3 and 13), and three CHLC items (2, 19, and 21) did not show significant factor loadings above .40. A PAF parallel analysis confirmed the four-factor solution when eigenvalues from the raw data were compared to eigenvalues from random data at the 95th percentile.

In a follow-up PAF, the data were restricted to a four-factor solution (see Table 1). The expected six GLHC items (4, 8, 12, 16, 20, and 24) loaded on the first factor, accounting for 16.30% of the variance. Four IHLC items (7, 15, 17, and 22) loaded on the second factor, accounting for 9.90% of the variance. Four CHLC items (5, 10, 11, and 14) and one PHLC item (9) loaded on the third factor, accounting for 9.02% of the variance. Three PHLC items (6, 18, and 23) loaded on the fourth factor, accounting for 6.21% of the variance. There were no significant cross-loadings above .40. The remaining three items had loadings below .40 on any factor.

Spanish language-preference group.—PAF using varimax rotation was conducted to explore the factor structure of the Spanish version of the MHLC scales. In contrast to the English version, a three-factor solution best fit the data of the Spanish version based on the variance accounted for by each individual factor and the interpretability of factors. A PAF parallel analysis confirmed this three-factor solution when eigenvalues from the raw data were compared to eigenvalues from random data at the 95th percentile. Three items (1, 2, and 6) did not show significant factor loadings above .40 on their corresponding scale (i.e., IHLC, CHLC, and PHLC scales, respectively).

In a follow-up PAF, the data were restricted to a three-factor solution (see Table 1). Six GLHC items (6, 8, 12, 16, 20, 24), five CHLC items (5, 11, 14, 19, and 21), and one PHLC item (9) loaded on the first factor, accounting for 18.43% of the variance. Five out of the

[1]CFA allowing the four hypothesized factors to be correlated was also conducted; model fit was not supported.
[2]EFA using oblique rotation to allow correlated factor solutions was also conducted; results were similar to EFA using varimax rotation. Results using varimax rotation are described because this is consistent with Wallston et al.'s (1978) original conceptualization of the MHLC scales as orthogonal.

seven items with the strongest factor loadings (> .6) were GLHC items. Five IHLC items (7, 10, 15, 17, and 22) loaded on the second factor, accounting for 9.47% of the variance. Four PHLC items (3, 13, 18, and 23) and one IHLC item (22) loaded on the third factor, which accounted for 7.87% of the variance. Item 22 from the IHLC scale cross-loaded between the second and third factor with significant factor loadings above .40. The remaining items had loadings below .40 on any factor.

Reliability Analysis

McDonald's omegas with confidence intervals and Cronbach's coefficient alphas were calculated for the original English IHLC (ω = .721, 95% CI [.640, .780]; α = .716), PHLC (ω = .591, 95% CI [.482, .673]; α = .595), CHLC (ω = .685, 95% CI [.602, .745]; α = .685), and GLHC (ω = .916, 95% CI [.893, .936]; α = .914) scales and the Spanish IHLC (ω = .725, 95% CI [.647, .786]; α = .736), PHLC (ω = .659, 95% CI [.578, .721]; α = .647), CHLC (ω = .728, 95% CI [.656, .799]; α = .731), and GLHC (ω = .801, 95% CI [.740, .844]; α = .814) scales. Because PAF of the current data found new factor structures with unique factor loadings of items, McDonald's omegas with confidence intervals and Cronbach's coefficient alphas were also calculated for scores of the newly derived English IHLC (ω = .795, 95% CI [.713, .856]; α = .795), PHLC (ω = .541, 95% CI [.411, .635]; α = .534), CHLC (ω = .662, 95% CI [.568, .737]; α = .661), and GLHC (ω = .916, 95% CI [.893, .936]; α = .914,) scales and Spanish IHLC (ω = .723 95% CI [.633, .788]; α = .731), PHLC (ω = .660, 95% CI [.566, .730]; α = .697), and GLHC/CHLC (ω = .851, 95% CI [.809, .884]; α = .850) scales.

Discussion

The results have significant implications for the use of the MHLC scales with English- and Spanish-speaking HAs. In confirmatory analysis, the hypothesized four-factor structure of the MHLC scales was not supported for the English language-preference group or Spanish language-preference group. Although the expected four-factor structure was supported in exploratory analysis, several items had factor loadings below .4 on their assigned scales, especially for the PHLC, CHLC and IHLC scales. In contrast, the original GLHC scale showed evidence of internal consistency and structural validity for HAs. The expected six GLHC items had strong factor loadings on their assigned scale, and the alpha was high.

Confirmatory analysis did not support the expected four-factor structure for the Spanish version of the MHLC and, instead, a three-factor structure was identified through exploratory analysis, with several GLHC and CHLC items (and one PHLC item) loading on the same factor. Given that five of the seven items with the strongest factor loadings on this factor were GLHC items, this factor likely represented a religious health locus of control construct, and it is possible that participants with Spanish language-preference, who were more likely to report a religious affiliation, perceived overlap between concepts related to God and chance. Another possible explanation could be problems in the Spanish translation of the MHLC scales that create more conceptual overlap among GLHC and CHLC items.

This study has limitations. The volunteer sample of HAs was drawn from the southwestern portion of the United States and HAs in the sample were primarily of Mexican descent; it is

possible that the evidence supporting the psychometric properties of scale scores might have been different for other HA subgroups. Sample size was adequate for the analysis conducted but not to allow subgroup (e.g., gender) analyses of equivalence.

Despite these limitations, the present study was the first to evaluate the psychometric properties and measurement invariance of the full 24-item MHLC scales for use with HA community adults with English or Spanish language-preference. This study provided some support for using the English version with HAs with English language-preference, but significant concerns are raised about the psychometric properties of scores from the Spanish version of the MHLC scales. This is unfortunate given the need to assess important constructs such as health locus of control in the growing HA population. Future studies should consider the translation equivalence of the Spanish MHLC to the original English version, with the goal of creating a reliable and valid translation that can be standardized and made available to researchers. Future studies should also examine whether independence of constructs (e.g., God HLC and chance HLC) may be dependent on sample characteristics (e.g., religiosity).

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References

Ahmedani BK, Peterson EL, Wells KE, et al. (2013) Asthma medication adherence: The role of God and other health locus of control factors. Ann Allergy Asthma Immunol 110(2): 75–79. [PubMed: 23352524]

Bentler PM (1990) Comparative fit indexes in structural models. Psychological Bulletin 107(2): 238–246. [PubMed: 2320703]

Bundek NI, Marks G and Richardson JL (1993) Role of health locus of control beliefs in cancer screening of elderly Hispanic women. Health Psychology 12(3): 193–199. [PubMed: 8500448]

Chaplin WF, Davidson K, Sparrow V, et al. (2001) A structural evaluation of the expanded Multidimensional Health Locus of Control scale with a diverse sample of Caucasian/European, Native, and Black Canadian women. Journal of Health Psychology 6(4): 447–455. [PubMed: 22049392]

Champagne BR, Fox RS, Mills SD, et al. (2016) Multidimensional profiles of health locus of control in Hispanic Americans. Journal of Health Psychology 21(10): 2376–2385. [PubMed: 25855212]

Dimitrov DM (2010) Testing for factorial invariance in the context of construct validation. Measurement and Evaluation in Counseling and Development 43(2): 121–149.

Dunn TJ, Baguley T and Brunsden V (2014) From alpha to omega: A practical solution to the pervasive problem of internal consitency estimation. British Journal of Psychology 105: 399–412. [PubMed: 24844115]

Ercikan K and Lyons-Thomas J (2013) Adapting tests for use in other languages and cultures. In: Geisinger KF, Bracken BA, Carlson JF, et al. (eds) APA handbook of testing and assessment in psychology, Vol. 3. Testing and assessment in school psychology and education. Washington DC: American Psychological Association, pp.545–569.

Fox RS, Malcarne VL, Roesch SC, et al. (2014) The Cultural Health Attributions Questionnaire (CHAQ): Reliability, validity, and refinement. Cultural Diversity Ethnic Minority Psychology 20(2): 283–292. [PubMed: 24773009]

Geisinger KF (1994) Cross-cultural normative assessment: Translation and adaptation issues influencing the normative interpretation of assessment instruments. Psychological Assessment 6(4): 304–312.

Hu LT and Bentler PM (1999) Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling 6: 1–55.

LaNoue M, Harvey A, Mautner D, et al. (2015) Confirmatory factor analysis and invariance testing between Blacks and Whites of the Multidimensional Health Locus of Control scale. Health Psychology Open 2(2): 1–16.

Luszczynska A and Schwarzer R (2005) Multidimensional health locus of control: Comments on the construct and its measurement. Journal of Health Psychology 10(5): 633–642. [PubMed: 16033785]

Malcarne VL, Fernandez S and Flores L (2005) Factorial validity of the Multidimensional Health Locus of Control scales for three American Ethnic Groups. Journal of Health Psychology 10(5): 657–667. [PubMed: 16033787]

Mills SD, Arredondo EM, Perez LG, et al. (2018) Psychometric properties of the God Locus of Health Control scale in churchgoing Latinas. Hispanic Journal of Behavioral Sciences 40(2): 227–239. [PubMed: 30906111]

Murguia A, Zea MC, Reisen CA, et al. (2000) The development of the Cultural Health Attributions Questionnaire (CHAQ). Cultural Diversity Ethnic Minority Psychology 6(3): 268–283. [PubMed: 10938635]

Muthén LK and Muthén BO (1998–2012) MPlus user's guide Los Angeles, CA: Muthén & Muthén.

Omeje O and Nebo C (2011) The influence of locus control on adherence to treatment regimen among hypertensive patients. Patient Preference and Adherence 5: 141–148. [PubMed: 21573044]

Sadler GR, Lee HC, Lim RS, et al. (2010) Recruitment of hard-to-reach United States population sub-groups via adaptations of snowball sampling strategy. Nurs Health Sci 12(3): 369–374. [PubMed: 20727089]

Satorra A and Bentler PM (2001) A scaled difference chi-square test statistic for moment structure analysis. Psychometrika 66: 507–514.

Steiger JH (1990) Structural model evaluation and modification: An interval estimation approach. Multivariate Behavioral Research 25: 173–180. [PubMed: 26794479]

United States Census Bureau (2018) Hispanic heritage month 2018. Available at: https://www.census.gov/newsroom/facts-for-features/2018/hispanic-heritage-month.html.

Wallston KA (2005) The validity of the Multidimensional Health Locus of Control scales. Journal of Health Psychology 10(4): 623–631. [PubMed: 16033784]

Wallston KA, Malcarne VL, Flores L, et al. (1999) Does God determine your Health? The God Locus of Health Control scale. Cognitive Therapy and Research 23(2): 131–142.

Wallston KA, Wallston BS and DeVellis R (1978) Development of the Multidimensional Health Locus of Control (MHLC) scales. Health Education Monographs 6(2): 160–170. [PubMed: 689890]

Table 1

Factor Loadings for Spanish and English MHLC Scales.

English					Spanish			
Items	**IHLC**	**PHLC**	**CHLC**	**GLHC**	**Items**	**IHLC**	**PHLC**	**GLHC**
IHLC1	.351	−.074	.007	−.053	IHLC1	.369	.086	−.021
IHLC7	**.640**	.124	.066	−.053	IHLC7	**.637**	.135	.064
IHLC10	.224	.072	**.425**	−.003	IHLC10	**.457**	−.125	.216
IHLC15	**.650**	.142	.099	−.166	IHLC15	**.654**	.055	.035
IHLC17	**.711**	.190	−.027	.003	IHLC17	**.640**	.330	−.130
IHLC22	**.747**	.142	−.145	−.043	IHLC22	**.592**	**.448**	−.128
PHLC3	.148	.331	−.077	.008	PHLC3	.151	**.492**	−.050
PHLC6	.162	**.444**	−.071	.073	PHLC6	.226	.331	−.172
PHLC9	.076	.003	**.463**	.117	PHLC9	.020	.103	**.430**
PHLC13	−.040	.372	.343	.097	PHLC13	−.063	**.558**	.147
PHLC18	.130	**.620**	.091	.109	PHLC18	.234	**.442**	.140
PHLC23	−.042	**.447**	.241	.101	PHLC23	.138	**.675**	.123
CHLC2	−.299	.292	.240	−.039	CHLC2	−.131	.183	.280
CHLC5	−.128	.288	**.445**	.139	CHLC5	−.086	.182	**.464**
CHLC11	−.085	−.031	**.630**	.116	CHLC11	−.057	.129	**.620**
CHLC14	−.032	−.059	**.643**	.139	CHLC14	−.131	.041	**.679**
CHLC19	−.285	.245	.314	−.025	CHLC19	.042	.100	**.441**
CHLC21	−.110	.271	.371	.241	CHLC21	.231	.011	**.546**
GLHC4	−.070	.160	−.023	**.769**	GLHC4	.133	.134	**.496**
GLHC8	−.063	.036	.365	**.678**	GLHC8	−.082	−.150	**.622**
GLHC12	−.012	.023	.243	**.798**	GLHC12	−.052	−.211	**.711**
GLHC16	−.061	.050	.183	**.795**	GLHC16	−.092	−.136	**.732**
GLHC20	−.114	.120	.111	**.862**	GLHC20	.144	−.098	**.600**
GLHC24	−.045	.090	.007	**.809**	GLHC24	.161	.014	**.631**

Note. All factor loadings above .4 are bolded