VALIDITY OF THE H-HANES ACCULTURATION MEASURE FOR
MEXICAN AMERICANS

M. Audrey Burnam, PhD, Marilyn M. McMillan, PhD,
Olivia D. Carter, MHS, Suzanne G. Haynes, PhD

December 1987

P-7391

The RAND Corporation

VALIDITY OF THE H-HANES ACCULTURATION
MEASURE FOR MEXICAN AMERICANS

M. Audrey Burnam, PhD
The RAND Corporation

Marilyn M. McMillan, PhD
National Center for Health Statistics*

Olivia D. Carter, MHS
National Center for Health Statistics

Suzanne G. Haynes, PhD
National Center for Health Statistics*

---

*Currently at the National Cancer Institute.

INTRODUCTION

The National Center for Health Statistics is mandated to
collect data on the health and nutritional status of the U.S.
population. The most recent effort was devoted to the study of
Hispanics. This study, the Hispanic Health and Nutrition
Examination Survey (H-HANES) involved surveys and health examinations
with approximately 12,000 Hispanics in the United States. This
was an important step forward in understanding the health needs
of Hispanic Americans. Hispanics numbered over 14.6 million in
the 1980 U.S. Census, and the population is growing rapidly due
to high birth rates and a steady influx of immigrants. Before
the H-HANES, however, little was known about health of Hispanics
since too few persons of Hispanic background were included in
previous national health surveys.

In attempting to learn about health of Hispanic American
populations, it is essential to realize that there is a wide
cultural diversity among persons of Hispanic origin or heritage
in the United States. Mexicans, Cubans, Puerto Ricans, and other
Hispanic groups have different cultural heritages, and even among
persons who share a cultural heritage, there is great variation
in the extent to which Anglo-American cultural behaviors and
values are expressed and the extent to which traditional native
culture or Hispanic ways of life are preserved. The designers of
the H-HANES realized the importance of this diversity: they
designed the study so that each of the three largest Hispanic
American ethnic groups (Mexicans, Cubans, and Puerto Ricans) was

sampled in sufficient numbers to be studied as a separate

population group, and they included a measure of acculturation

in the survey, so that cultural variations within a single

population group could be investigated.[1]

Acculturation refers to changes in behaviors and values made by

members of one culture as a result of contact with another culture.

These changes are commonly conceived as occurring within an individual,

but they may also occur across generations. The process of

acculturation appears to be dynamic. For example, some individuals

acculturate more rapidly than others in the same circumstances; and

acculturative changes may occur at different times and at varying rates

across the lifecourse of a given individual. Acculturation is not

necessarily unidirectional, as some individuals, particularly U.S. born

Mexican Americans, may change in the direction of becoming less

acculturated (more influenced by the culture of origin). Because

acculturation refers to a fundamental type of adaptation, which may

include learning a new language and a new system of values as well as

new customs, it follows that level of acculturation may be reflected in

many different aspects of behavior, beliefs, and attitudes. If

acculturation occurs at different rates or in different directions

across various aspects of an individual's life experience, then

multidimensional measures of acculturation may be required.

Acculturation can be theoretically distinguished from a number of

related concepts. Migration refers to geographical mobility.

Acculturation may follow after immigration into a new cultural setting,

but is not synonymous with migration. Assimilation refers to cultural

and social integration of members of two different cultures. Although

acculturation may occur among individuals, this does not assure full
social and political acceptance by the host culture. Finally,
socioeconomic status, although often correlated with acculturation among
Mexican Americans, refers to educational, economic, and occupational
standing in a society, all of which are affected by many factors other
than degree of acculturation.

The measure of acculturation selected for use in the H-HANES was
brief, given the many other measures of health and health service use
which needed to be included in the survey. Previous literature had
documented several more-lengthy measures of acculturation which
covered a broader range of behaviors and attitudes thought to be
important indicators of acculturation.[2-6] Psychometric studies of
these scales had often indicated, however, that language and ethnic
background accounted for a major portion of the variability of the
measures.[5] So, through necessity imposed by time constraints and
respondent burden, the H-HANES acculturation items were limited to
eight, covering language use, ethnic background, and generation. These
items were selected from the longer Acculturation Rating Scale for
Mexican Americans developed by Cuellar and colleagues,[5] and were
adapted for use in the H-HANES.

In spite of a justifiable rationale for selecting an abbreviated
measure, the validity of this acculturation measure had not been
established. One reason to question the validity of the measure is that
other aspects of acculturation, such as food and music preferences,
ethnic interaction, language use across different types of
relationships, and participation in cultural traditions, were not
assessed. If acculturation is multidimensional, with language

and ethnic background reflecting only one small part of the broader construct, such a brief acculturation measure may not be adequate.

This paper reports the results of analyses which were conducted to shed light on the question of the validity of the H-HANES measure. The analyses were conducted using household survey data from the Los Angeles Epidemiologic Catchment Area (ECA) project.[7-9] The survey included a 26-item measure which assessed acculturation in a comprehensive fashion, including language preference and use in a variety of contexts, ethnic background and identification, culturally linked customs and habits, and ethnic interaction. The reliability and validity of this scale have been described elsewhere.[10] A subset of items included in this scale was the eight H-HANES acculturation items, worded and formatted identically to those in the H-HANES.

The analyses reported here were designed to address a number of questions relating to the validity of the H-HANES acculturation scale among Mexican Americans. First, what are the internal reliability and factor structure of the 8-item H-HANES acculturation scale in the Los Angeles Mexican American sample? A comparison of the psychometric characteristics of the H-HANES acculturation scale in the Los Angeles Mexican American sample with its characteristics in the H-HANES Mexican American sample would provide a test of the replicability of the factor structure and the robustness of the scale's internal reliability.

Second, what is the concordant validity of the H-HANES acculturation measure in the Los Angeles Mexican American sample? This question was addressed in part by examining the H-HANES acculturation

scale's relation to the 26-item ECA acculturation scale and subscales. If the ECA scale assessed significant aspects or dimensions of acculturation which were independent from those assessed by the H-HANES acculturation scale, low correlations of the H-HANES acculturation scale or subscales with the ECA scale or subscales would be expected. In addition, a comparison of the internal reliability of the H-HANES acculturation scale with the ECA acculturation scale would indicate whether the 8-item scale is less homogenous than the more comprehensive 26-item ECA scale.

Third, what is the criterion validity of the H-HANES acculturation scale? If the H-HANES acculturation scale is able to discriminate generation groups among Mexican Americans and to predict years in the United States among the first generation as well as the ECA acculturation scale, further support is provided for its validity.

And finally, to what extent do the H-HANES and ECA acculturation scales display similar relationships to demographic characteristics, and to chronic illnesses such as hypertension and diabetes among Los Angeles Mexican Americans? Similar relationships found between these illness variables and the two measures of acculturation would support the comparability of the scales as predictors of health status.

METHODS

Study Design and Sample

The Los Angeles ECA survey is one of five field studies which
comprise the ECA program. The methods for these studies are described
in detail by others.[11-13] The purpose of the program was to
determine the prevalence of specific mental disorders and use of health
services in selected geographically bounded populations in the United
States. The Los Angeles study was designed to focus on Mexican
Americans. Although other sites used study designs that provided
information on special population groups such as elderly, Black, and
rural populations, only the Los Angeles site interviewed Hispanics in
sufficient numbers to estimate prevalence of disorders or use of
services in this group. The Los Angeles metropolitan area provides a
unique opportunity to study Mexican Americans, who form the largest of
the Hispanic ethnic groups in the United States, because Los Angeles has
by far the largest Mexican American population of any U.S. city. Over
40% of all Mexican Americans reside in the state of California, and
about half of Mexican Americans in California reside in Los Angeles
County.

Two mental health catchment areas in metropolitan Los Angeles
define the target population of this study. One of these areas, in East
Los Angeles, contains a population that is predominantly Hispanic (83%);
the other catchment area, in the Venice/Culver City area of West Los
Angeles, has a largely non-Hispanic White population, but also includes
many Hispanics (21%). Eighty-seven percent of the Hispanics in these
two catchment areas are of Mexican ethnic origin.

The sample, stratified by catchment area, was selected using a two-stage area probability design. Primary Sampling Units were census blocks (occasionally aggregated or disaggregated to maintain a uniform sampling unit size), and Secondary Sampling Units were households. One adult aged 18 or older was selected from each sample household for inclusion in the study using a modified Kish procedure that provided a random selection of all adults within households.[14] A total of 3132 adults completed survey interviews. The overall interview completion rate was 68% of the sampled households.

To classify respondents as Mexican American, we used survey questions regarding self-identified ethnic background, place of birth, parents' ethnic background, and parents' place of birth. In most cases, the classification was unambiguous. When ambiguity was found (for example, a respondent whose father was of Mexican ethnic background and born in Mexico, whose mother was of French ethnic background and born in the United States, and who identified themselves as "American" in ethnic background), then these persons reporting some Mexican origin or descent were classified as Mexican American. Individuals who were born in countries other than the United States or Mexico were not classified as Mexican American. Using this definition, a total of 1245 respondents were designated Mexican American.

The H-HANES did not interview persons 75 years of age or older. Of the Mexican American adults in the Los Angeles ECA sample, only 4.5%, or 56 persons, were 75 or older. These persons were retained in the analyses presented here. There is no reason to suspect that their inclusion would bias the results or conclusions.

Measurement of Acculturation

ECA measure. The 26-item ECA acculturation measure was based
upon the Acculturation Rating Scale for Mexican Americans (ARSMA) by
Cuellar and colleagues[5] and the Behavioral Acculturation Scale of
Szapocznik and colleagues.[2] These scales were selected for several
reasons: 1) they had demonstrated reliability and validity, 2) they
were relatively brief, 3) they focused on actual behavior rather than
preferences, and 4) they covered aspects of acculturation which were
consistent with our definition of the construct. However, neither could
be used as part of a direct interview in a community sample without
modification. The ARSMA was addressed specifically to Mexican
Americans, the Behavioral Acculturation Scale specifically to Cuban
Americans, and both scales used self-administered rather than interview
formats. Some items in these scales also seemed inappropriate for all
age groups (e.g., "Way of relating to fiancee") or for persons with
little or no formal education (e.g., "In what language are the books and
magazines you read?"). The H-HANES had revised ARSMA items regarding
language of reading and writing and ethnic background so that they were
appropriate for Hispanics of different ethnic origins and for interview
administration. The ECA acculturation scale therefore included all of
the items developed for the H-HANES, and added additional interview
items modified or directly replicated from the ARSMA and the Behavioral
Acculturation Scale. Aspects of acculturation covered by the items are
language familiarity and use in different social contexts, ethnic
interaction, activities reflecting cultural traditions and lifestyle,
and ethnic background. The content of items and values given to

responses are shown in Appendix A.

Factor analytic techniques were utilized to determine whether scores reflecting independent dimensions of acculturation could be empirically justified. Three factors were identified, but their high intercorrelations, and the fact that one factor accounted for most of the factor variance suggested that a unidimensional scaling of all 26 items was appropriate.[10]

Total scale scores were created by summing item values and dividing by the number of items. Scale items could be missing due to respondent refusals or because an item was not appropriate for a given individual (e.g., language use with spouse was not determined for unmarried respondents). When responses to more than 20% of the items were missing, the total score was considered missing. If fewer than 20% of the items were missing, then the mean value of nonmissing items for that individual was calculated and replaced missing values.

Subscales based on the three factors derived from factor analysis were also created, using unit weighted items. As with the total scale, the items were summed and divided by the total number of items contained in each subscale. When more than 20% of items were missing the subscale score was missing. Means for nonmissing items were imputed to missing items when less than 20%.

H-HANES acculturation measure. The eight items which compose the H-HANES acculturation measure are starred in Appendix A. They assess language of reading and writing, and ethnic background. In factor analyses of data from the H-HANES Mexican American adult sample, two factors were identified, a language factor and an ethnic background factor, each having four items. A single factor which included all

eight items was also suggested from the analyses.[15]

H-HANES acculturation scales and subscales were created for the Los Angeles Mexican American sample using similar procedures to those employed by the National Center for Health Statistics. A total H-HANES acculturation scale score was created by summing the values of all items and dividing by 8. When data were missing for the language of reading and/or language of writing items, means for the nonmissing items were imputed to the missing items. Persons having missing data on any of the other items were assigned missing scores on the total scale score. Subscales based on the two factors were also created. As for the total scale, subscale scores were unit weighted sums of item values divided by the number of items in the subscale.

The H-HANES collected data to distinguish first, second, and later generations but did not collect data on birthplace of respondents' grandparents which would be needed to distinguish third, fourth, and fifth generation Mexican Americans for the generation item (number 1 in Appendix A) of the acculturation measure. Consequently, this item took values of 1 (first generation), 2 (second generation), and 4 (third or later generation) in the H-HANES dataset. In the Los Angeles ECA survey, the item took values of 1 (first generation), 2 (second generation), 3 (third generation), 4 (fourth generation), and 5 (fifth or later generation). The correlation of the generation item with itself, when scored first with all five values and then with the three values that were used by the H-HANES, was r=.973 in the Los Angeles sample. The correlation of the H-HANES scale with itself using the two alternative value ranges of the generation item was r=.999. Since this

difference had a negligible effect on the scale, subsequent analyses are presented using the 5-value generation item.

RESULTS

Dimensionality of Acculturation Scales

The eight items of the H-HANES acculturation scale were factor analyzed in the subsample of 1243 Mexican Americans included in the Los Angeles ECA study. A principal components factor analysis with varimax rotation was employed. Two factors with eigenvalues over 1.0 were extracted. Table 1 (tables are located after the Reference section) shows factor loadings for both the unrotated and rotated two-factor solution. The first factor accounted for 68% of the factor variance, compared with 13% for the second factor. The unrotated factor loadings show that all items load positively on one factor, and that no items load more heavily on the second than the first factor. Loadings on the rotated factors show that the two factors previously identified in the analysis of the H-HANES Mexican American sample by the National Center for Health Statistics, reflecting language use and ethnic background, were replicated. However, two of the items, generation and self-identified ethnic background, load highly on both factors.

Table 2 is taken from Burnam, Telles, Karno et al.,[10] and shows the identical factor analysis which was performed using the full 26 acculturation items included in the Los Angeles ECA. The three rotated factors which were extracted from this analysis assess dimensions of language use, social environment, and ethnic background. All items but one loaded more heavily on the first unrotated factor than the second. The first factor accounted for much more of the total factor variance (62%) than the second two (6% and 5%, respectively).

Total scale scores and subscale scores based on the factors

reported above for each of the H-HANES and ECA acculturation measures were created as described previously. The correlations of the H-HANES total scale and subscales with the ECA total scale and subscales are given in Table 3. The total H-HANES scale correlated very highly with the total ECA scale. Each H-HANES subscale, particularly the language subscale, is also highly related to the total ECA scale. The H-HANES language and background subscales are very highly correlated with their counterpart ECA language and background subscales. The ECA social environment subscale, which has no H-HANES counterpart, is the subscale which has the lowest correlation with the total H-HANES scale and subscales, but even here the correlations indicate 22% to 40% shared variance between the ECA social subscale and the H-HANES subscales.

Table 4 shows the correlations among the H-HANES total scale and subscales. The total scale is highly correlated with each of the language and background subscales, which in turn are highly correlated with one another. The two subscales share 52% of their variance, while at least 80% of each subscale's variance is shared with the total scale.

Internal Reliability of Acculturation Measures

Table 5 shows the correlation of each item with the total scale (corrected by excluding the item itself from the total) for the H-HANES scales and subscales. Cronbach Alpha statistics for each scale, and for the scale if each successive item were deleted, are also given. These data show that two items have marginal utility for the internal reliability of the total scale -- ethnic background of mother and father. For the subscales, each item contributes to internal reliability. The overall internal reliability of the total scale and each subscale is very high as indicated by alpha statistics

exceeding .80.

Data comparing the internal reliability of the H-HANES total

scale with that of the ECA total scale for the entire Los Angeles

Mexican American sample, and for specific sex, educational, and language

of interview subgroups are shown in Table 6. Alpha statistics for the

ECA total scale exceed .90 for the total sample and for each sex,

educational, and language subgroup. Although the H-HANES scale shows

slightly lower internal reliability than the ECA scale for the total

Mexican American sample and each sex, education, and language subgroup,

the reliabilities of both scales are very high across all groups. Only

for language subgroups and education of 8th grade or less do the alpha

statistics for the H-HANES scale fall below .90.

Alpha statistics are also shown for the H-HANES language and

background subscales. The language subscale consistently displays

higher internal reliability than the background subscale, and has

slightly higher internal reliability than the total H-HANES scale for

most subgroups examined.

Validity of the Acculturation Measures

If an acculturation scale is valid, it should be able to

discriminate Mexican American generation groups, and among first

generation Mexican Americans, it should show increases in acculturation

scores with greater time spent in the United States. The H-HANES and ECA

acculturation scales were examined against these two external criteria

of validity.

Among the Los Angeles Mexican American sample, 59% were first

generation individuals who were born in Mexico, 27% were second

generation with one or more parents born in Mexico, and 15% were third

or later generation. Table 7 shows mean acculturation scores using the ECA scale and H-HANES scale by each of these generation groups. Each scale has a possible range from 1, indicating Spanish-language or Mexican cultural orientation, to 5, indicating English-language or Anglo-American cultural orientation. Both the H-HANES and ECA acculturation scores showed significant increases from first to second, and second to later generation groups. The overall F test in an analysis of variance, and the highly conservative Scheffe means comparison test was significant at $p < .0001$ for each generation comparison. Each scale showed a 1.5 point difference in means between first and second generations. There was a 0.6 point difference between the second and later generation groups with the ECA scale, and a 0.8 point difference between these groups with the H-HANES scale. Among Mexican Americans who have immigrated to the United States, level of acculturation is significantly correlated ($p < .0001$) with total number of years they have lived in the United States, with the ECA scale having a slightly higher correlation than the H-HANES acculturation scale.

Association of Acculturation to Demographic Characteristics and Illness

In order to determine whether demographic correlates of acculturation are similar for the ECA and H-HANES acculturation measures, the associations were examined in both bivariate and multivariate analyses. Sex, age, years of completed education, marital status (married, formerly married, never married), and employment status (currently employed or not) were entered simultaneously as predictors of acculturation in a linear regression. Table 8A shows the resulting coefficients when these demographics were regressed on the H-HANES and

then the ECA total scale scores. The relationships between these
demographic characteristics and acculturation are very similar when
using either the H-HANES or ECA scales. Simple correlations (Pearson
r's) between the demographic characteristics and acculturation scores
are also shown (see Table 8B). Very similar zero-order correlations of
demographics to acculturation were found across the two scales.

Respondents in the Los Angeles ECA study were asked whether they
had ever had a number of serious and persistent illnesses, including
asthma, diabetes, heart trouble, arthritis, and hypertension. Some or
all of these could be related to culturally linked aspects of
environment and lifestyle. To compare the H-HANES and ECA acculturation
scales in their ability to predict lifetime prevalence of these illnesses,
a series of logistic regression analyses were performed in which the
probability of having illness (e.g., asthma) was the dependent variable,
and acculturation, sex, and age were independent variables. Logistic
regressions were repeated using each of the H-HANES and ECA
acculturation scores separately. Table 9A shows the regression
coefficients resulting from these analyses. After controlling for sex
and age, lower acculturation is a significant predictor of asthma and
diabetes, but not heart trouble, arthritis, or hypertension. The
findings are the same whether the H-HANES or ECA acculturation scales
were used, and the regression coefficients of acculturation are similar
for the two scales. Simple correlations of acculturation to illness are
also similar across the H-HANES and ECA acculturation scales, as seen in
Table 9B.

SUMMARY AND CONCLUSIONS

The H-HANES acculturation measure was fielded as part of a larger battery of acculturation items in the Los Angeles ECA survey, which included personal interviews with 1245 Mexican American adults.

Factor analyses of the H-HANES acculturation items in this sample revealed two factors, replicating the dimensions identified in analyses of the H-HANES Mexican American sample by the National Center for Health Statistics. These dimensions were language use and ethnic background. The dimensions were not clearly distinct, however, as seen by their high intercorrelation, and the tendency for all items to load on a single factor. As an overall measure of acculturation, a single scale composed of all eight items would be appropriate. Separate language and ethnic background subscales, however, might be useful in analysis when one of the subscales (e.g., language) is of special substantive interest. One disadvantage of using the language subscale, however, is that two of its four items are not appropriate for illiterate persons, which may reduce the precision of this subscale among those with little or no education. A further caution in using the subscales rather than a single total scale is that, because the subscales share over half of their variance, use of both in a single analysis will limit the researcher's ability to interpret effects due to one or the other subscale.

The concordant validity of the H-HANES acculturation scale was examined by comparing it with the 26-item ECA acculturation scale, a more comprehensive measure of acculturation with established reliability and validity both in the current study and for its parent scales in prior studies. The H-HANES total scale correlated very highly with the ECA

total scale, showing that the abbreviated H-HANES scale is very comparable to a fuller acculturation measure. Correlations among subscales of the two measures indicated that the H-HANES scale least adequately represents a social dimension of acculturation, which includes items such as the ethnicity of friends and coworkers, eating Hispanic foods, and celebrating Hispanic traditions. This social dimension of acculturation, however, was not well distinguished from the other two ECA acculturation dimensions in prior analyses, and explained only 6% of the total factor variance.[10] Nor was the social subscale clearly distinct from the H-HANES scale in the present analysis. The correlation between these two was substantial (r=.61). Among Mexican Americans, language use and ethnic background appear to be closely related to social indicators of acculturation such as culturally related activities and social environment. Extensive questioning regarding different situations of language use, and music and radio listening did not seem to enhance the ECA language subscale of acculturation beyond that assessed by the 4-item H-HANES language subscale; the two were very highly correlated (r=.98). Ethnic background subscales did not differ substantially in item content across the H-HANES and ECA acculturation measures, and were also very highly correlated (r=.97).

The internal reliability of the H-HANES acculturation measure was very high, far beyond the acceptable level of .70, for the total Mexican American sample, and for specific sex, age, education, and language subgroups. Even with many fewer items than the ECA acculturation measure, the internal reliability of the H-HANES acculturation scale was only slightly lower. Each of the H-HANES subscales also demonstrated high internal reliability, particularly the language subscale.

The validity of the H-HANES acculturation scale was evaluated using two external criteria, generation level and, among those who were born in Mexico, number of years spent in the United States. The H-HANES scale was highly related to each of these criteria; the strength of the relationships to the criteria was similar for the H-HANES and ECA acculturation measures. These analyses indicated that the H-HANES measure has adequate criterion validity, comparable to that of a more comprehensive acculturation measure. Although generation level and years in the United States have commonly been used as validating criteria for acculturation measures, they are weak criteria in two ways. First, generation level is an item included in both the ECA and H-HANES scales, and years in the United States is an item in the ECA scale. Therefore these are not independent criteria. Second, they are both gross rather than sensitive indicators of acculturation level. More comprehensive methods of validation which include in-depth interviewing or ratings by a knowledgeable observer may be more sensitive, but they were not feasible in this study.

Is the brief H-HANES acculturation measure sensitive enough to uncover any existing relationships of acculturation to health in the H-HANES study? In comparison to the much longer ECA acculturation scale, the H-HANES scale was similarly related to demographic and chronic illness variables in bivariate and multivariate analyses of the Los Angeles ECA data. This suggests that the H-HANES acculturation scale will be able to detect, as adequately as a more comprehensive measure, important relationships regarding acculturation and health.

Overall, these analyses suggest that the H-HANES acculturation scale is both internally reliable and valid, and that little was lost in

limiting its length to eight items assessing language use and
ethnic background. One limitation of this study is that the validity of
the scale was examined only in a population of Mexican Americans
residing in Los Angeles. The findings may not generalize to populations
of Mexican Americans in other regions of the United States. It would be
particularly inappropriate to generalize the results to the measurement
of acculturation in other Hispanic American groups, such as those of
Cuban or Puerto Rican origin.

Another possible limitation of these findings is that the standard
of comparison for the concordant validity analyses was the ECA
acculturation scale. To the extent that this scale is deficient in its
coverage of important dimensions of acculturation, the validity of both
the H-HANES and ECA acculturation measures becomes questionable. On the
other hand, it is quite possible that measures of acculturation which
attempt to be even more comprehensive than the ECA acculturation scale
will either measure highly correlated aspects of acculturation (e.g.,
cultural values), or measure concepts which are theoretically tangential
rather than central to the acculturation construct (e.g., socioeconomic
status). In our review of the literature on acculturation measures for
Hispanic Americans, we found little empirical evidence for central
dimensions of acculturation which were likely to be distinctive beyond
the realm covered by the ECA acculturation scale.[10] Future work,
however, may identify other such dimensions, and suggest improved
measurement strategies. Until such time, the H-HANES acculturation
scale can be considered equivalent to other acculturation scales such as
the ARSMA of Cuellar et al.[5] and the Los Angeles ECA acculturation
scale[10] for measurement of acculturation among Mexican Americans.

REFERENCES

1. National Center for Health Statistics: Plan and Operation of the Hispanic Health and Nutrition Examination Survey, 1982-84. Vital and Health Statistics. Series 1, No. 19. DHHS Pub. No. (PHS) 85-1321. Public Health Service. Washington: U.S. Government Printing Office, September 1985.

2. Szapocznik, J, Scopetta, MA, Aranalde, M, Kurtines, W: Cuban value structure: Treatment implications. J Consult Clin Psych 1978; 46: 961-970.

3. Szapocznik, J, Kurtines, W: Acculturation, biculturalism, and adjustment among Cuban Americans. In: Padilla, AM (Ed): Acculturation: Theory, Models and Some New Findings. Boulder, CO: Westview Press, 1980, 139-159.

4. Olmedo, EL, Martinez, JL Jr., Martinez, SR: Measure of acculturation for Chicano adolescents. Psychological Reports 1978; 42:159-170.

5. Cuellar, I, Harris, LC, Jasso, R: An acculturation scale for Mexican American normal and clinical populations. Hispanic Journal of Behavioral Sciences 1980; 2:199-217.

6. Padilla, AM: The role of cultural awareness and ethnic loyalty in acculturation. In: Padilla, AM (Ed): Acculturation: Theory, Models, and Some New Findings. Boulder, CO: Westview Press, 1980, 47-84.

7. Hough, RL, Karno, M, Burnam, MA, Escobar, JI, Timbers, DM: The Los Angeles Epidemiologic Catchment Area research program and the epidemiology of psychiatric disorders among Mexican Americans. J of Operational Psych 1983; 14:42-51.

8. Burnam, MA, Hough, RL, Escobar, JI, Karno, M, Timbers, DT, Telles, CA, Locke, BZ: Six-month prevalence of psychiatric disorders: Mexican Americans and Nonhispanic Whites in Los Angeles. Archives of General Psychiatry, 1987; 44:687-694.

9. Karno, M, Hough, RL, Burnam, MA, Escobar, JI, Timbers, DM, Santana, F, Boyd, JH: Lifetime prevalence of specific psychiatric disorders among Mexican Americans and Nonhispanic Whites in Los Angeles. Archives of General Psychiatry 1987; 44:695-701.

10. Burnam, MA, Telles, CA, Karno, M, Hough, RL, Escobar, JI: Measurement of acculturation in a community population of Mexican Americans. Hispanic Journal of Behavioral Sciences 1987; 9:105-130.

11. Eaton, WW, Regier, DA, Locke, BZ, Taube, CA: The Epidemiologic Catchment Area program of the National Institute of Mental Health. Public Health Reports 1981; 96:319-325.

12. Regier, DA, Myers, JK, Robins, LN, Blazer, DG, Hough, RL, Eaton, WW, Locke, BZ: The NIMH Epidemiologic Catchment Area (ECA) Program: Historical context, major objectives and study population characteristics. Arch Gen Psych 1984; 41:934-941.

13. Eaton, WW, Kessler, LG (Eds): Epidemiologic Field Methods in Psychiatry: The NIMH Epidemiologic Catchment Area Program. Florida: Academic Press, 1985.

14. Kish, L: Survey Sampling. New York: Wiley, 1965.

15. National Center for Health Statistics: Adolescent and Adult History Questionnaire, Aged 12-74 years, H-HANES 1982-84, United States Data Tape Documentation, Version 2 (Tape number 6521). Hyattsville, MD: National Center for Health Statistics, 1987.

Table 1. H-HANES Acculturation Scale Factor Loadings

	Unrotated		Varimax Rotation	
	Factor 1	Factor 2	Factor 1 (Language)	Factor 2 (Ethnic Background)
Generation	.82	.13	.63	.54
Language spoken	.89	-.27	.91	.23
Language preferred	.90	-.25	.90	.25
Language read better	.91	-.27	.91	.24
Language write better	.92	-.25	.91	.26
Ethnic background	.81	.02	.68	.43
Mother's background	.67	.61	.25	.87
Father's background	.64	.64	.21	.88

Table 2.   Los Angeles ECA Acculturation Scale Rotated
Orthogonal Factor Loadings

Factor 1 (Language)		Factor 2 (Social Environment)		Factor 3 (Ethnic Background)	
Language spoken	.84	Ethnicity neighborhood	.76	Generation	.60
Language preferred	.83	Ethnicity coworkers	.53	Mother's background	.83
Language w/spouse	.76	Ethnicity close friends	.73	Father's background	.81
Language w/children	.81	Time eat Hisp. food	.57		
Language w/parents	.62	Celebrate Hisp. tradition	.46		
Language w/coworkers	.75	Ethnicity leisure activities	.66		
Language w/friends	.81				
Language TV viewing	.84				
Language radio listening	.83				
Language thinking	.83				
Language read better	.86				
Language used in reading	.85				
Language write better	.85				
Time listen to Latin music	.60				
Ethnic background	.57				
Country spent childhood	.78				
Proportion life in Hisp. country	.77				

Table 3. Correlation of H-HANES Acculturation Scales to
ECA Acculturation Scales

	ECA Scales			
	Total Scale	Language Subscale	Social Subscale	Background Subscale
H-HANES Scales				
Total scale	.96	.96	.61	.82
Language subscale	.97	.98	.63	.64
Background subscale	.78	.75	.47	.97

Table 4. Correlations Among H-HANES Acculturation
Total Scale and Subscales

	Total Scale	Language Subscale	Background Subscale
Total scale		.96	.89
Language subscale			.72
Background subscale			

Table 5.   Internal Reliability of H-HANES Acculturation
Scale and Subscales

	Corrected Item-Total Correlation	Alpha if Item Deleted
Total Scale (Alpha=.93)		
Generation	.76	.92
Language spoken	.86	.91
Language preferred	.86	.91
Language read better	.88	.91
Language write better	.89	.91
Ethnic background	.75	.92
Mother's background	.58	.93
Father's background	.55	.94
Language Subscale (Alpha=.96)		
Language spoken	.90	.95
Language preferred	.89	.95
Language read better	.92	.94
Language write better	.92	.95
Background Subscale (Alpha=.84)		
Generation	.69	.80
Ethnic background	.64	.82
Mother's background	.71	.79
Father's background	.67	.81

Table 6. Internal Reliability (Alpha Statistics) for ECA
Acculturation Scale and H-HANES Acculturation
Scale in Selected Demographic Subsamples

	ECA Total Scale	H-HANES Total Scale	H-HANES Language Subscale	H-HANES Background Subscale	(Number of Persons)
Total Mexican Americans	.97	.93	.96	.84	(1196)
Sex					
Males	.97	.93	.96	.86	(568)
Females	.97	.93	.97	.83	(628)
Education					
8th grade or less	.96	.88	.94	.75	(488)
High School (9-12)	.96	.91	.94	.82	(512)
College (13+)	.94	.90	.90	.80	(191)
Language					
English	.91	.81	.91	.74	(614)
Spanish	.93	.85	.84	.76	(581)

Table 7. Acculturation Relation to Generation and to Years in the
United States within First Generation

| | ECA Total Scale | | H-HANES Total Scale | |
	Mean	Correlation w/yrs. in U.S.	Mean	Correlation w/yrs. in U.S.
First generation	1.8	.37	1.4	.33
Second generation	3.3		2.9	
Third or later generation	3.9		3.7	

Table 8. Demographic Correlates of Acculturation

A. Standardized Estimates of Beta from Linear Regression of
Demographics on Acculturation

	H-HANES Acculturation Scale	ECA Acculturation Scale
Sex	.06	.03
Age	.14	.16
Education	.69	.72
Married	-.09	-.09
Formerly married	.02	.02
Employed	.00	-.01
Total R^2	.47	.51

B. Simple Correlations of Demographics with Acculturation

	Sex	Age	Education	Married	Formerly Married	Employed
H-HANES Acculturation Scale	.04	-.08	.66	-.22	.12	.08
ECA Acculturation Scale	.01	-.05	.69	-.22	.14	.07

Table 9. Acculturation Relation to Lifetime Illnesses

A. Logistic Regressions of Sex, Age, and Acculturation on Lifetime Illnesses

	Asthma	Diabetes	Heart Trouble	Arthritis	Hypertension
Sex	.05	.35	.23	.24	.34
Age	.00	-.06	-.04	-.07	-.06
ECA acculturation	-.81	-.28	-.20	-.04	-.07

Sex	-.02	.37	.22	.21	.33
Age	.00	-.06	-.04	-.06	-.06
H-HANES acculturation	-.89	-.35	-.23	-.04	-.14

B. Simple Correlations of Acculturation with Lifetime Illness

	Asthma	Diabetes	Heart Trouble	Arthritis	Hypertension
H-HANES acculturation	.15	.04	.04	-.02	.01
ECA acculturation	.13	.04	.04	-.01	.00
(Unweighted % with illness)	(5.2)	(7.3)	(6.3)	(20.8)	(20.2)

Appendix A.

Acculturation Items

*1. <u>Generation</u>

     First   1
     Second   2
     Third   3
     Fourth   4
     Fifth   5

*2. <u>Language spoken</u>

     Spanish only   1
     Mostly Spanish   2
     About the same   3
     Mostly English   4
     English only   5

*3. <u>Language preferred</u>

     Spanish only spoken or preferred . . . 1
     Mostly Spanish 2
     Both equally   3
     Mostly English 4
     English only spoken or preferred . . . 5

4. <u>Language use with spouse</u>

     Spanish only   1
     Mostly Spanish 2
     Equally   3
     Mostly English 4
     English only 5

5. <u>Language use with children</u>

     Spanish only   1
     Mostly Spanish 2
     Equally   3
     Mostly English 4
     English only 5

6. <u>Language use with parents</u>

       Spanish only 1
       Mostly Spanish 2
       Equally 3
       Mostly English 4
       English only 5

7. <u>Language use with coworkers</u>

       Spanish only 1
       Mostly Spanish 2
       Equally 3
       Mostly English 4
       English only 5

8. <u>Language use with friends</u>

       Spanish only 1
       Mostly Spanish 2
       Equally 3
       Mostly English 4
       English only 5

9. <u>Language of TV viewing</u>

       Spanish only 1
       Mostly Spanish 2
       Equally 3
       Mostly English 4
       English only 5

10. <u>Language of radio listening</u>

       Spanish only 1
       Mostly Spanish 2
       Equally 3
       Mostly English 4
       English only 5

11. <u>Language of thinking</u>

        Spanish only   1
        Mostly Spanish 2
        Equally   3
        Mostly English 4

*12. <u>Language reads better</u>

        Spanish only   1
        Spanish better 2
        Both the same 3
        English better 4
        English only   5
            (If doesn't read, then missing)

13. <u>Language used when reading</u>

        Spanish only   1
        Spanish mostly 2
        Both the same 3
        English mostly 4
        English only   5
            (If doesn't read, then missing)

*14. <u>Language writes better</u>

        Spanish only   1
        Spanish mostly 2
        Both the same 3
        English better 4
        English only   5
            (If doesn't read, then missing)

15. <u>Ethnicity of people in neighborhood</u>

        All Hispanic   1
        Most Hispanic 2
        Half Hispanic 3
        Few Hispanic   4
        None Hispanic 5

16. <u>Ethnicity of coworkers</u>

     All Hispanic   1
     Most Hispanic 2
     Half Hispanic 3
     Few Hispanic   4
     None Hispanic 5

17. <u>Ethnicity of close friends</u>

     All Hispanic   1
     Most Hispanic 2
     Half Hispanic 3
     Few Hispanic   4
     None Hispanic 5

18. <u>Proportion of time eat Hispanic foods</u>

     All of the time   1
     Most of the time 2
     Half of the time 3
     Sometimes   4
     Never 5

19. <u>Proportion of time listen to Latin music</u>

     All of the time   1
     Most of the time 2
     Half of the time 3
     Sometimes   4
     Never 5

20. <u>Proportion of time celebrate in Hispanic tradition</u>

     All of the time   1
     Most of the time 2
     Half of the time 3
     Sometimes   4
     Never 5

21. <u>Ethnicity of leisure-time social environment</u>

       All Hispanic   1
       Mostly Hispanic   2
       Half Hispanic   3
       Some Hispanic   4
       None Hispanic   5

*22. <u>Ethnic background</u>

       Mexican   1
       Chicano   2
       Mexican American 3
       Latin American, other Hispanic American 4
       Anglo American or other 5

*23. <u>Mother's ethnic background</u>

       Mexican   1
       Chicano   2
       Mexican American 3
       Latin American, other Hispanic American 4
       Anglo American or other 5

*24. <u>Father's ethnic background</u>

       Mexican   1
       Chicano   2
       Mexican American 3
       Latin American, other Hispanic American 4
       Anglo American or other 5

25. <u>Country spent childhood</u>

       U.S. 4
       Other 2

26. <u>Proportion of life lived in U.S. vs. Hispanic country</u>

      U.S. only 5
      Mostly U.S., part Hispanic 4
      Equal 3
      Mostly Hispanic, part U.S. 2

VALIDITY OF THE H-HANES ACCULTURATION MEASURE FOR MEXICAN AMERICANS

Burnam, McMillan