



Published in final edited form as:

Health Psychol. 2005 January ; 24(1): 88–95. doi:10.1037/0278-6133.24.1.88.

Acculturation-Related Variables, Sexual Initiation, and Subsequent Sexual Behavior Among Puerto Rican, Mexican, and Cuban Youth

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Abstract

The relationship among acculturation-related variables, past sexual activity, and subsequent sexual behavior was examined for a sample of Latino youth in the United States over a 12-month period. A subsample from the National Longitudinal Study of Adolescent Health database was analyzed by means of a prospective design. History of sexual intercourse predicted subsequent sexual behavior over the ensuing 12 months. The acculturation-related variables were related to whether an adolescent reported being sexually active at Wave 1 but in a complex fashion. Among recent immigrants, youth from English-speaking homes were less likely to be sexually active than those from Spanish-speaking homes. The opposite was observed for youth who were born in the United States or who had resided in the United States most of their lives.

Keywords

Latino youth; sexual behavior; HIV risk behavior; acculturation

Ethnic minorities have been affected disproportionately by the AIDS epidemic. In recent years, the proportion of new AIDS cases among Latinos in the United States has increased, while the proportion of AIDS cases among European Americans has decreased. The AIDS case rate among Latinos in 2000 was almost three times higher than that for European Americans. Sexual exposure is the primary route of infection for young people. Female adolescents and young women account for 58% of reported AIDS cases among 13–19-year-olds (Centers for Disease Control and Prevention, 2000). Most women and female adolescents are infected through heterosexual sex. Given the above facts, understanding the sexual behavior of Latino youth is important for developing prevention efforts.

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Research suggests that for Latinos, many problem behaviors in general and sexual risk taking in particular are related to acculturation, or the extent to which Latinos have incorporated U.S. culture into their lives (Barnes, 1979). Acculturation stress theory suggests that when a member of a minority group is exposed to stressful situations (e.g., language difficulties, discrimination), there is increased vulnerability to maladaptive behavior. This is especially true when there are few personal resources (e.g., financial and social supports) to moderate the effects of those stressors (Vega, Zimmerman, Gil, Warheit, & Apospori, 1993). Research on acculturation has yielded inconsistent results in the prediction of adolescent problem behaviors (Rogler, Cortes, & Malgady, 1991). Some studies suggest that individuals who are highly acculturated tend to exhibit less involvement in problem behavior (Salgado de Snyder, 1987; Yu & Harburg, 1981). Other studies suggest the opposite, with higher levels of acculturation being associated with higher rates of problem behavior, such as suicide attempts and psychiatric illness (Burnham, Hough, Karno, Escobar, & Telles, 1987; Sorenson & Golding, 1988). Further studies suggest a curvilinear relationship, in which moderate levels of acculturation are associated with the least amount of problem behavior (Berry, Trimble, & Olmedo, 1986; Szapocnik & Kurtines, 1980; Szapocnik, Kurtines, & Fernandez, 1980; Wong-Rieger & Quintana, 1987). Still other studies have found a different curvilinear function, whereby moderately acculturated Latinos show the highest incidence of problem behavior (Fraser, Piacentini, Van Rossem, Heim, & Rotherum-Borus, 1998). Finally, some studies have revealed no consistent relationship between acculturation and whether a given individual engages in problem behavior (Smither & Rodriguez-Giegling, 1979). Research examining the relationship between acculturation and sexual risk behavior in Latino youth has yielded similar patterns of inconsistent results (Brindis, Wolfe, McCarter, Ball, & Starbuck-Morales, 1995; Darabi & Ortiz, 1987; Durant, Pendergast, & Seymore, 1990; Ford & Norris, 1993; B. V. Marin, Gomez, Keegles, & Tschann, 1993; Reynoso, Felice, & Shragg, 1993; Rogler et al., 1991; Ventura, 1988). Given this clouded picture, the relationship of acculturation-related variables to adolescent sexual risk behavior in Latino youth requires further elaboration, preferably with nationally representative samples.

The present research examined the relationship between variables related to acculturation and sexual activity by using a national sample of Mexican American, Cuban American, and Puerto Rican youth. The study explored the relationship between transitions to sexual activity and acculturation-related variables in each of these subgroups, testing for different functional forms across the groups. The focus of the research was on the degree of exposure to the host culture (as indexed by the amount of time the adolescent has lived in the United States) and acceptance of the host culture (as indexed by the primary language spoken in the home, English or Spanish). Past research has tended to examine one or the other of these variables in predicting sexual activity, or it has obscured their possible independent effects by forming a composite index of the two of them. In contrast, the present research tested for the possibility of independent influences. Specifically, we hypothesized that simple exposure to U.S. culture would have an influence on sexual risk taking independent of acceptance of the host culture and that acceptance of the host culture would have an independent influence on sexual risk taking independent of degree of exposure. Related to these two hypotheses, we thought it likely that the two acculturation-related variables might interact to predict sexual activity, such that the impact of acceptance of the host culture on sexual activity might differ depending on how long the adolescent has lived in the United States. For example, acculturating to the host culture may have different effects for a family that has recently immigrated to the United States than for a family that has been in the United States for most of the life of the adolescent. Although it is possible to hypothesize a number of different functional forms that the interaction might take based on theory, we adopted an exploratory perspective that involved first empirically isolating the form of the interaction and then, once isolated, considering theoretical mechanisms that were consistent with it. As will be seen, a complex and interesting interaction

dynamic was observed. No study to our knowledge has tested for an interaction dynamic between the two acculturation-related variables.

Method

Respondents and Procedure

The analysis used the Add Health database (Harris et al., 2003; Udry, 1997). Add Health is a school-based sample of 20,745 adolescents in Grades 7 through 12. The sampling frame was a random sample of 80 high schools stratified by region, urbanicity, school type, ethnic mix, and size. For each school, a “feeder” school that sent its graduates to the high school was identified for the inclusion of seventh and eighth graders. Some high schools spanned Grades 7 to 12, functioning as their own feeder school.

A questionnaire was given to a random sample of 12,105 adolescents selected from the school rosters. Several oversamples were recruited to permit analyses of group differences among Latinos, including Cuban American adolescents and Puerto Rican adolescents. (Mexican American adolescents were not oversampled because they occur with sufficient frequency naturally.) A parent, typically the resident mother, also completed a questionnaire. Adolescents in Grades 7–11 were interviewed again 1 year later, and these adolescents were the focus of the present study. Specifically, we focused our analyses on never-married adolescents in Grades 7–11 who self-reported that they were of Latino or Hispanic heritage and either Mexican American, Puerto Rican, or Cuban American.

Most interviews were conducted in the home. Data were collected on laptop computers. The interviewer read questions and entered the respondent’s answers. For more sensitive sections, the respondent listened to prerecorded questions through earphones and entered answers directly. A detailed description of the study is available at <http://www.cpc.unc.edu/addhealth>.

Measures

Latino ethnicity—Adolescents indicated their ethnicity by responding to multiple questions. First, they were asked if they were of Hispanic or Latino origin. If they answered yes, they were asked their Latino background. Only adolescents responding affirmatively to the first item and only those self-identifying as Mexican, Puerto Rican, or Cuban were included in the sample.

Acculturation-related variables—The first variable was the length of time that the adolescent had resided in the United States. Adolescents were asked if they were born in the United States and if not, they were asked to indicate when they moved to the United States. These items, coupled with an item about age, were used to quantify the number of years the adolescent had lived in the United States. Conceptually, this index is a rough indicator of the amount of exposure to U.S. culture: Adolescents residing within the United States for longer periods of time have probably had more exposure to the U.S. majority culture, on average. A second variable focused on language spoken in the home. Respondents were asked, “What language is usually spoken in your home?” This item was a rough indicator of the extent to which the respondent’s family had adopted the majority host culture. Adolescents reporting Spanish as the primary language were viewed as less likely to have embraced the host culture compared with their Latino English-speaking peers. Although language spoken and length of time residing within the United States are not direct measures of acculturation, both variables have been used extensively in the literature on acculturation (Nguyen, Messé, & Stollack, 1999). They have been predictive of important sexual outcomes, such as transition to sexual intercourse, condom usage, and number of sexual partners.

Sexual behaviors—Virgin status as reported at Wave 1, or the adolescent's first assessment, was the primary outcome variable in this study because of its central role in predicting future sexual risk behavior of adolescents and because the predictors of the initiation of a risk behavior may be different from those that predict subsequent risk behavior once the behavior has been initiated (Quinlan, Jaccard, & Blanton, 2000; Viken, Kaprio, Koskenvuo, & Rose, 1999). To assess this variable, we asked participants whether they had ever engaged in vaginal sexual intercourse. Four additional outcome measures were assessed, focusing on whether the adolescent engaged in vaginal sexual intercourse between the two waves of assessment; if so, whether the adolescent had used birth control at his or her most recent intercourse; if so, whether the adolescent had used a condom; and whether the adolescent had become pregnant since the first interview (asked only of female adolescents). Sexual intercourse was defined for respondents as the insertion of the penis into the vagina.

Demographic variables—Demographic measures included religion, religiosity, maternal education, gender, grade, and family structure. Religious affiliation classified respondents into four groups: Catholic, Protestant, Jewish, and other. Religiosity was scored on a rating scale from 1 to 4, with higher scores reflecting greater religiosity. Maternal education was classified into seven groups: 0 = *never attended school*, 1 = *less than 8th grade*, 2 = *did not graduate from high school*, 3 = *high school graduate*, 4 = *trade school*, 5 = *some college but did not graduate*, 6 = *college degree*, and 7 = *professional training beyond college*. Family structure measures asked whether a mother figure resided in the home and about the presence of a father figure.

Analytic strategy—Add Health used a stratified cluster sample. Student level sampling weights, primary sampling units, and strata have been derived by Add Health statisticians (Tourangeau & Shin, 1998). These weights were used with the statistical algorithms in Software for the Statistical Analysis of Correlated Data based on the robust estimators of Binder (1993). Both weighted and unweighted analyses were performed to explore robustness of conclusions across weighting schemes.

We conducted the analyses in three stages. The first stage involved descriptive analyses of differences in sexual behavior, the acculturation variables, and selected demographic variables as a function of Latino subgroup. This analysis was intended to isolate subgroup differences in the core variables being studied. The second stage established the importance of the primary outcome variable, virgin status at Wave 1, by showing that it was predictive of future sexual activity. Specifically, it was used to predict prospectively (using the Wave 2 data) whether the adolescent engaged in sex during the ensuing 12 months, whether some form of protection was used if intercourse occurred during the ensuing 12 months, and, if the adolescent was female, whether a pregnancy occurred in the ensuing 12 months. The third stage of the analysis tested the relationship between the acculturation-related variables and whether the adolescent had transitioned to sexual activity at Wave 1. The analysis first established an interactive relationship between the variables and then considered a wide range of potential confounds that might explain the observed relationships as well as the generalizability of the results across the Latino subgroups. These analyses took the form of logistic regressions and were supplemented by piecewise regression strategies to further elaborate the underlying dynamics. In all analyses, experimentwise error rates across multiple contrasts for variables with more than one degree of freedom were controlled using the Holm-modified Bonferroni procedure (Jaccard, 1998).

Results

Descriptive Analyses

Table 1 presents descriptive statistics for the Latino subgroups. Puerto Ricans tended to be more sexually active than Cuban Americans and Mexican Americans and tended to show a higher incidence of pregnancy. There were no significant subgroup differences in the use of either contraception or condoms. Puerto Ricans were more likely to speak English in the home and also were more likely to have been born in and lived longer in the United States than were Mexican American or Cuban American youth. These results are important because they show that the classic acculturation indexes of language spoken and length of residence in the United States are confounded with Latino subgroups. Any effects of such variables may not reflect the effects of acculturation-related constructs per se but instead may simply reflect differences in the cultures of the Latino subgroups. Our results underscore the importance of controlling for the confound when making inferences.

Although Puerto Ricans were more likely to have a singleparent household, no significant subgroup differences were observed for whether the families were receiving public assistance. There were significant subgroup differences in parental education (see Table 1).

Analysis of Outcome Variables

Nonvirgin status at Wave 1 was associated with both future sexual activity and the occurrence of a pregnancy in the ensuing 12 months, but it was not associated with either index of contraceptive use (condom use or pregnancy protection). Using odds ratios, we calculated that nonvirgins at Wave 1 were 18 times more likely than virgins to engage in sexual intercourse during the next 12 months (95% confidence interval [CI] = 11 to 28) and were 6 times more likely to experience a pregnancy (95% CI = 2 to 20). The association between virgin status as measured at Wave 1 and subsequent sexual activity during the subsequent year as measured at Wave 2 varied by grade level, with the predicted odds ratio of nonvirgins to virgins decreasing as adolescents grew older. However, the effect of virgin status was statistically significant at each grade level for all ethnic groups. These data affirm the importance of our primary virgin status outcome variable.

Acculturation-Related Variables and Transitions to Sexual Activity

To analyze the relationship between the acculturation-related variables and whether the adolescent had transitioned to sexual activity by Wave 1, we used logistic regression (in which the outcome was scored 1 = *nonvirgin at Wave 1*, 0 = *virgin at Wave 1*). In the initial analyses, we included only language spoken and years of exposure as predictor variables. Models with additional covariates are described later. Whether the adolescent was born in the United States was not included because it was highly correlated with the number of years the adolescent had lived in the United States ($r = .71, p < .05$). Model diagnostics suggested that the number of years of exposure was nonlinearly related to the outcome variable; hence, a squared polynomial term for this predictor was included. Diagnostics also suggested an interaction between language spoken and years of exposure; hence, product terms for these variables also were included, by using the methods described in Jaccard (2000). The logistic coefficients for the analysis are in Table 2. The -2 normalized log likelihood for the model with interaction terms (2,054.9) was significantly smaller than that for the model omitting the interaction terms (2,075.1; model difference = 20.2 with 2 degrees of freedom, $p < .01$). The curvilinear and interactive effects can be seen in Figure 1, which plots the predicted odds of having made the transition to being sexually active as a function of exposure time for adolescents whose primary language spoken in the home is English and for those for whom it is Spanish. It can be seen that the predicted odds of being a nonvirgin are somewhat higher for Spanish speakers as opposed to English speakers when the number of years living in the United States is low. At

higher number of years residing within the United States, the predicted odds of being a nonvirgin diverge as a function of language spoken in the home and reverse in direction, so that nonvirgins are more likely to occur in English-speaking as opposed to Spanish-speaking families. Models with interaction terms to determine whether these relationships varied as a function of Latino subgroup, grade, and gender yielded no statistically significant group differences, suggesting that the basic trends operate in each subgroup and are relatively robust across groups. The effect was confirmed in separate subgroup analyses. We also found no moderating effects of religion or religiosity.

Demographic Confounds

The trends in Figure 1 could, in theory, be attributed to demographic variables that are confounded with the acculturation-related variables. Of interest is whether the curves in Figure 1 are altered in a significant fashion when demographic covariates are introduced into the equation. We examined the coefficients representing the interaction effect between the acculturation-related variables for statistical significance when each of the following demographic variables was introduced into the model: religion, religiosity, grade, gender, maternal education, Latino subgroup (Puerto Rican, Mexican American, and Cuban American), family income, and family structure (one- vs. two-parent family). The interaction between the variables remained statistically significant, with the plots of the predicted odds yielding the same basic curvature as that of Figure 1. We also tested whether the interaction for the acculturation-related variables remained significant when interactions between each of them and the demographic variables were included in the equation (e.g., when a Grade \times Language interaction was included). In all cases, the fundamental interaction remained statistically significant. The effects of the acculturation-related variables seem robust across a range of demographic confounds.

Piecewise Analyses

Because of the complex dynamics that operate among place of birth, years of exposure, chronological age, and Latino subgroup, we examined the curve in Figure 1 on a piecewise basis to gain better insight into underlying mechanisms. We focused first on the part of the curve for adolescents who had lived for 11 years or less in the United States ($N = 283$). Virtually all of these adolescents were immigrants, so place of birth (not United States) is constant. Most were Mexican American (65%) and Cuban American (29%). Length of time that adolescents had lived in the United States was nonsignificantly correlated with age of the adolescent ($r = .16$), suggesting that age and years of exposure to U.S. culture were not confounded for these adolescents. Thus, this part of the curve tends to characterize immigrant Mexican Americans and Cuban Americans who differ in the amount of exposure they have had to U.S. culture and whose age is unconfounded with such exposure.

According to Figure 1, only a weak relationship, if any, should be present for years of exposure to U.S. culture and transitions to sexual activity for this group. This result was replicated in the piecewise analysis focusing only on these adolescents: A bivariate logistic regression of virgin status onto years of exposure yielded a statistically nonsignificant coefficient for years spent in the United States (odds ratio = 1.06, 95% CI = 0.97 to 1.22). Figure 1 also suggests that adolescents in this group who are from Spanish-speaking homes may be more likely to be nonvirgins than adolescents in English-speaking homes. The majority of the subsample (87%) came from Spanish-speaking homes, and there were only 35 cases in which adolescents reported that English was spoken in the home. A Fisher's exact test on the 2×2 contingency table examining the relationship between language spoken in the home and virgin status was statistically significant ($p < .05$), with 24% of the adolescents from Spanish-speaking homes having made the transition to being sexually active, whereas only 8% of the adolescents from English-speaking homes had done so. This also affirms the trend shown in Figure 1.

The small number of cases of English-speaking families makes it difficult to statistically control confounds for this effect, so the result must be viewed with theoretical tentativeness. For this subsample, adolescents from the English-speaking homes tended to be older and to have lived longer in the United States and were more likely to be Puerto Rican than were adolescents from Spanish-speaking homes. All of these confounds are in a direction that would encourage heightened sexual activity in the English-speaking versus Spanish-speaking homes, which is opposite to what we observed. Controlling for these confounds might strengthen rather than weaken the observed effect.

In sum, the analyses suggest that for immigrant Latino adolescents who have lived in the United States for 11 years or less (who are predominately Mexican Americans and Cuban Americans), the amount of exposure to U.S. culture is nonsignificantly associated with transitions to sexual activity. However, those from homes in which Spanish is the primary language spoken are more likely to be sexually active than those from homes in which English is the primary language spoken.

The second part of the piecewise analysis focused on the curve for adolescents who had lived in the United States for 12 or more years ($N = 1,752$). The majority of these adolescents (88%) were born in the United States; 62% were Mexican American, 15% were Cuban American, and 23% were Puerto Rican. A logistic regression analysis targeting just these adolescents replicated the fundamental dynamics of the curves shown in Figure 1 and showed the reversal of the effects of language spoken in the home. The dynamics were evident both with and without the covariates mentioned earlier.

In contrast to the previous piecewise sample, there was a strong relationship between years of exposure to U.S. culture and age ($r = .81, p < .01$). This is not surprising given that most of the sample were born in the United States. Thus, it is unclear whether the effects associated with years of exposure to U.S. culture are just an artifact of maturational processes due to age. We regressed nonvirgin status onto age, time lived in the United States, and language spoken in the home, and all three predictors yielded significant ($p < .05$) logistic coefficients. Increased age and increased exposure time were associated with higher predicted odds of transitioning to sexual activity, and adolescents from English-speaking homes were more likely than those from Spanish-speaking homes to have done so. This suggests that the acculturation variables are impacting sexual activity independent of age confounds.

Additional Mediators, Confounds, and Outcome Variables

The fundamental interactive relationship between the two acculturation-related variables and nonvirgin status also was observed when the outcome variable was whether the adolescent engaged in sexual intercourse between the two waves. However, the effects on this outcome became statistically nonsignificant when we added nonvirgin status (as measured at Wave 1) as a covariate to the equation, which suggests that the fundamental mechanisms operating are through the initial transition to becoming sexually active. We also entered as covariates into the prediction equation a large number of social–psychological variables, including the adolescent’s attitude toward pregnancy; whether the adolescent was in a romantic relationship; the adolescent’s satisfaction with parents, perceived parental disapproval of engaging in sex, self-esteem, perceived intelligence, academic achievement, and perceptions of risk for HIV and an unintended pregnancy; and indexes of physical development. None showed evidence of being either mediators or confounders of the observed effect.

Discussion

Latino adolescents have been found to be at increased risk of sexually transmitted diseases and HIV. Several theorists have suggested that acculturation to American culture may contribute

to such risk. Past research has yielded inconsistent findings. The present study used a national sample of Latino adolescents to explore the relationship between two classic variables related to acculturation and transitions to sexual activity, namely length of time lived in the United States and language spoken in the home. We observed a link between these variables and such transitions but in a more complex fashion than has been observed previously. Past studies have tended to ignore confounds between the acculturation variables and Latino subgroups and have ignored possible interaction effects between the two acculturation-related variables. Our analysis took such factors into account and observed interesting dynamics that are worthy of further investigation.

For recent immigrants to the United States (i.e., families who have spent less than 12 years of the adolescent's life in the United States), there was no significant relationship between the number of years spent in the United States and the likelihood of making the transition to sexual activity. There was, however, a tendency for adolescents who come from English-speaking families to have a lower probability of making this transition than those from Spanish-speaking families. This dynamic was exactly the opposite for Latino youth who had lived in the United States since birth or for most of their lives. For these youth (at least the older ones), those who came from English-speaking homes were more likely to have engaged in sexual activity.

The puzzle is why this dynamic occurs. What mechanisms render adaptation to the host culture (as reflected by adopting the language of the host culture) both a risk factor (in the case of youth who have lived most of their lives in the United States) and a protective factor (in the case of immigrants)? We explored demographic and social mediators and confounders and found no consistent, reasonable explanatory mechanisms. One tentative explanation for the results focuses on the qualitatively different interactions that Latino youth have with the host culture as a function of exposure time. For recent immigrants, issues surrounding the stresses and strains of transitioning to a new country and culture are relevant. It may be that families that are less likely to embrace the host culture make it more difficult for their children to fit in, thereby creating stress for them. Acculturation stress theory suggests that such children will be at greater risk of problem behavior (Burnham et al., 1987). For adolescents born in the United States or who have spent most of their lives there, issues of transitioning to a new country are moot. For these adolescents, families that primarily speak English might be those that have greater contact with the host culture outside of homogeneous Latino communities, and this contact could lead to more experiences of discrimination. The stress associated with such experiences may lead to higher levels of problem behavior.

The above explanation is speculative. Add Health did not include measures to permit a reasonable evaluation of such an explanation, and future research is required to explore such dynamics in a more comprehensive way. Competing explanations of acculturation stress theory might focus on the nature of the peer networks of English-speaking versus Spanish-speaking, recent versus nonrecent immigrants. Also important for future research is a rigorous analysis of American and Latino cultures themselves, so as to determine whether indeed there are features of each culture that may contribute to the pattern of results we observed independent of acculturation stress. Although there have been speculative accounts (Falicov, 1998; Reynoso et al., 1993; Ventura, 1988), careful science-based analyses are lacking.

It would be interesting to reexamine past research to see whether the inconsistent results across studies could be explained by our results. If we could isolate which part of the curve in Figure 1 that past studies were tapping into, we could determine whether a coherent pattern exists relative to our theoretical structure. We attempted to do this but found the task impossible. For example, the vast majority of past research either amalgamates length of time spent in the United States and language-based variables into one index of acculturation or just uses one index or the other as an index of acculturation while ignoring its counterpart. These practices

and the level of detail reported in past research made it impossible to tease out whether a given study was consistent with the pattern of results that we observed. Future research needs to model and report the range of scores on these two variables separately to help gain perspectives on the potential interactive dynamics at play.

The acculturation trends that we observed tended to generalize across different subgroups, as suggested by the nonsignificant interaction of the acculturation variables with ethnic nativity, gender, grade, religion, and religiosity. There is some research to suggest that gender dynamics may be particularly important for the Latino culture because of gender-based power imbalances that can limit a woman's or female adolescent's ability to negotiate sexual practices (Amaro, 1995; Pulerwitz, Amaro, DeJong, Gortmaker, & Rudd, 2002). However, this research has explored the significance of these variables with adult populations and may not be applicable to Latino adolescents. More research on the role of gender in the adolescent acculturative process relative to sexual risk behavior is needed.

The acculturation effects we observed were evident when the outcome variable was nonvirgin status (which reflects the initial transition to sexual activity) as well as when the outcome variable was sexual activity between the two waves of data collection. However, the effects on sexual activity between waves became nonsignificant when we added nonvirgin status as a covariate to the prediction equations. This suggests that the acculturation dynamics are most relevant to the initial transition to sexual activity rather than to sexual activity once that transition has been made.

Another important finding from the present study was the observation of differences in sexual activity as a function of Latino subgroup, with Puerto Ricans tending to be more sexually active than Cuban Americans and Mexican Americans. The subgroups also differed on important demographic variables, including language spoken in the home (Puerto Ricans were more likely to speak English) and length of time having residence in the United States, underscoring the importance of recognizing group differences and confounds in research with Latinos. On the other hand, the acculturation dynamics predicting sexual activity did not vary appreciably as a function of ethnic nativity, a result that highlights potential similarities shared across groups as well.

The present study examined two widely investigated acculturation-related variables, time spent in the United States and language spoken in the home. Although relevant to the acculturation process, these variables are not synonymous with acculturation. Acculturation is a complex process that has been conceptualized and measured in a variety of ways. For example, although almost all acculturation scales include variants of one or both of the variables we focused on, some also include questions about the individual's preferred ethnic identity, knowledge of historical events from the country of origin, frequency of participation in cultural practices, and subscription to family values and gender roles associated with the ethnic group (Balcazar, Castro, & Krull, 1995; Hazuda, Stern, & Haffner, 1988; G. Marin & Marin, 1991). Future research should incorporate these dimensions of acculturation in addition to those of the present investigation to gain a fuller perspective on acculturation dynamics. Our research suggests the importance of considering interaction models when examining acculturation-related variables. Also of interest would be integrating such research with other potential psychological mediators, such as the importance of virginity and values associated with abstaining from sex.

As with any investigation, this study has limitations. The measure of virgin status relied on self-reports, which may be subject to distortion. Add Health assured respondents of confidentiality, and the respondents did not report their behavior directly to an interviewer, instead recording their answers directly onto a laptop computer. This helps minimize self-report bias. The team of investigators responsible for Add Health used state-of-the-art methods for

reducing self-report bias (see the description of methods at <http://www.cpc.unc.edu/addhealth>), but caution is still required when interpreting the data. Another potential limitation is that the acculturation-related variables were used to predict transitions to sexual activity, but that activity could have occurred years prior to the assessment of acculturation. This is not problematic if one assumes that the acculturation-related variables are relatively stable over time (such as speaking Spanish vs. English in the home) or if the outcome behavior did not occur too far in the distant past. For the latter, the median age of adolescents in the sample was 15, and the median age at which the transition to sexual activity occurred was 14, which suggests that the time discrepancy is not that large. Nevertheless, care must be exercised in interpreting our results. A final problem was the measure of place of birth, which asked if adolescents were born in the United States. For Puerto Rican youth, this was ambiguous, as some viewed Puerto Rico as part of the United States, whereas others imposed a mainland versus island distinction onto the query. However, the percentage of Puerto Rican youth who reported being born in the United States in our study was comparable with census data that used more appropriate questions (National Center for Health Statistics, 2002), suggesting that our question format may not be problematic. Despite these limitations, our analyses suggest several trends worthy of further study.

Acknowledgments

This research is based on data from the Add Health project, a program project designed by Richard Udry (Principal Investigator) and Peter Bearman and funded by National Institute of Child Health and Human Development Grant P01-HD31921 to the Carolina Population Center, University of North Carolina at Chapel Hill, with cooperative funding participation by the National Cancer Institute; the National Institute of Alcohol Abuse and Alcoholism; the National Institute on Deafness and Other Communication Disorders; the National Institute of Drug Abuse; the National Institute of General Medical Sciences; the National Institute of Mental Health; the National Institute of Nursing Research; the Office of AIDS Research, National Institutes of Health (NIH); the Office of Behavior and Social Science Research, NIH; the Office of the Director, NIH; the Office of Research on Women's Health, NIH; the Office of Population Affairs, Department of Health and Human Services (HHS); the National Center for Health Statistics, Centers for Disease Control and Prevention, HHS; the Office of Minority Health, Centers for Disease Control and Prevention, HHS; the Office of Minority Health, Office of Public Health and Science, HHS; the Office of the Assistant Secretary for Planning and Evaluation, HHS; and the National Science Foundation. The analyses reported in this study were funded by National Institute of Mental Health, Office of AIDS Research Grant RO3 MH1632 to Vincent Guilamo-Ramos. This study was approved by the Columbia University Institutional Review Board.

Vincent Guilamo-Ramos and James Jaccard planned the study and wrote the manuscript together. Vincent Guilamo-Ramos analyzed the data. Juan Pena and Vincent Goldberg participated in literature reviews, data analysis, and interpretation of results.

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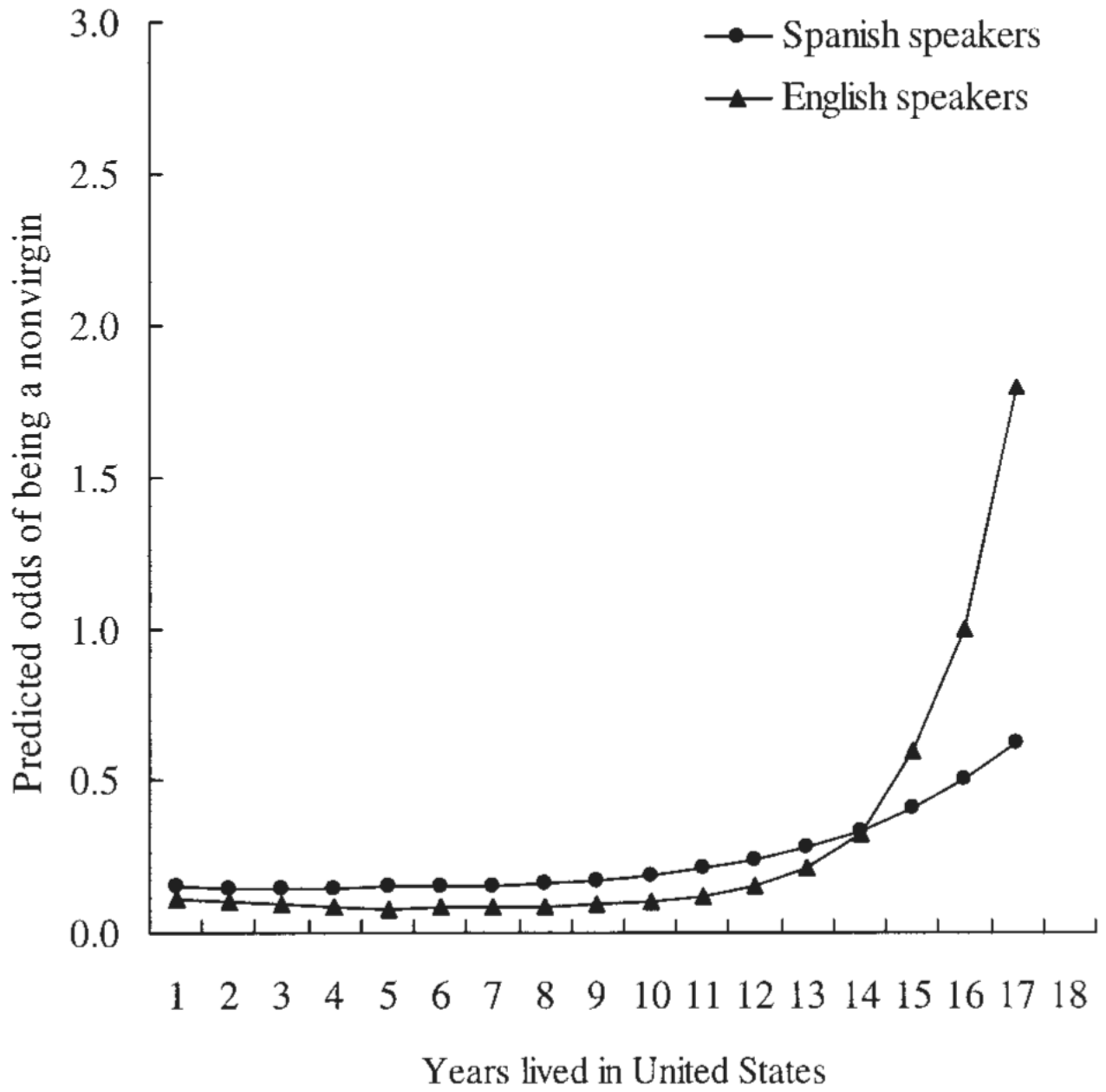


Figure 1. Predicted odds of having engaged in sexual intercourse as a function of the Time Residing Within the United States \times Primary Language Spoken in the Home interaction.

Table 1

Descriptive Statistics for Sample Based on Weighted Analyses

| Demographic and sexual behavior variables | Mexican | Puerto Rican | Cuban |
|---|---------------------|-------------------|---------------------|
| Sample size | 1,284 | 416 | 335 |
| % nonvirgin at Wave 1 | 31 ^{a,b,1} | 44 ^a | 23 ^{b,1} |
| % had sex between waves | 38 ^{a,1} | 47 ^{a,2} | 28 ^{a,1,2} |
| % got pregnant between waves | 5 ^{a,1} | 8 ^{a,1} | 4 ^{a,1} |
| % used birth control | 65 ^{a,1} | 62 ^{a,1} | 46 ^{a,1} |
| % speak English in home | 54 | 80 | 33 |
| % in single-parent home | 28 ^a | 51 | 35 ^a |
| % on welfare | 17 ^a | 24 ^{a,1} | 24 ^{a,1} |
| Mean years lived in United States | 13.2 ^a | 14.5 | 12.6 ^a |
| Mean maternal education | 2.6 ^b | 3.3 ^a | 3.1 ^{a,b} |

Note. % got pregnant between waves applies only to female respondents and was measured at Wave 2; % used birth control refers to report of whether birth control was used at most recent intercourse given that the respondent reported having sexual intercourse between waves. Groups with a common Arabic superscript within a row are not significantly different from each other in the weighted analyses ($p < .05$). Groups with a common numerical superscript within a row are not significantly different from each other in the unweighted analyses ($p < .05$).

Table 2

Logistic Coefficients for Prediction of Virgin Status at Wave 1 From Language Spoken in the Home and Number of Years Lived in United States

| Model term | Coefficient | SE | p | Exponent | 95% CI |
|----------------------------------|-------------|-------|------|----------|------------|
| <i>L</i> | 0.076 | 0.199 | .70 | 1.08 | 0.72, 1.60 |
| <i>E</i> | 0.214 | 0.072 | <.01 | 1.24 | 1.07, 1.43 |
| <i>E</i> ² | 0.011 | 0.007 | .11 | 1.01 | 0.99, 1.02 |
| <i>L</i> × <i>E</i> | 0.240 | 0.075 | <.01 | 1.27 | 1.09, 1.48 |
| <i>L</i> × <i>E</i> ² | 0.015 | 0.008 | .07 | 1.02 | 0.99, 1.03 |
| Intercept | -1.055 | 0.155 | | | |

Note. $N = 1,835$; -2^* normalized log likelihood for model = 2,054.9; model-approximate $\chi^2(5, N = 1835) = 260.5, p < .01$. Exponent = exponent of the logistic coefficient; 95% confidence interval (CI) = 95% confidence limit for exponent of the logistic coefficient; *L* = language, the dummy variable, scored 1 = *English spoken in home*, 0 = *Spanish spoken in home*; *E* = exposure, the number of years the adolescent reported living in the United States, mean centered.