

Acculturation, Coping Styles, and Health Risk Behaviors Among HIV Positive Latinas

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Abstract This study examined the relationships among acculturation, coping styles, substance use, sexual risk behavior, and medication non-adherence among 219 Latinas living with HIV/AIDS in Los Angeles, CA. Coping styles were hypothesized to mediate the link between acculturation and health risk behaviors for HIV positive Latinas. Structural equation modeling revealed that greater acculturation was related to less positive coping and more negative coping. In turn, negative coping was associated with more health risk behaviors and more non-adherence. Positive coping was associated with less substance use as reflected in use of cigarettes and alcohol and less non-adherence. Coping styles mediated the relationship between acculturation and health risk behaviors. Findings echo previous works examining the Hispanic Health Paradox wherein more acculturated Latinos exhibit increased risk behavior and maladaptive coping styles. HIV/AIDS interventions need to be mindful of cultural differences

within Hispanic populations and be tailored to address these differences.

Keywords Acculturation · Coping styles · Latinas · HIV/AIDS · Hispanic

Introduction

In the United States, HIV/AIDS disproportionately impacts Latinas. Although they comprise 9% of the population, they account for 15% of HIV incidence rates [1]. The CDC reports that for Latinas rates of HIV infection are 4 times greater than for non-Latina White women and that Latinas constitute a growing proportion of new infections [1–3]. Despite these alarming trends, insufficient research has explored how Latinas experience HIV/AIDS. Latinas infected with HIV/AIDS face added obstacles; they cope not only with the disease but also must contend with socioeconomic issues such as linguistic or cultural barriers, gender discrimination/racism, low socioeconomic status, and limited access to health care, all of which contribute to the overall maintenance of the illness [4–6]. Few studies have examined cultural factors as they relate to coping styles and health risk behavior in HIV/AIDS infected Latinas.

The present study examines acculturation and its association with health risk behaviors of HIV positive Latinas by positing coping styles as a mediating mechanism between the two. With the exception of one recent study among Latino MSM (men who have sex with men) [7]; the linkage between acculturation, coping styles and health promoting behaviors has not been examined among HIV positive Latinas. The conceptual model driving this study is an extension of three related areas within the literature:

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acculturation's role in health risk behaviors for Latinos, the impact of acculturation on coping styles for Latinos, and the impact of coping styles on health risk behaviors of HIV positive persons.

Previous research with Latino populations has indicated that acculturation is related to health and mental health outcomes [8–10]. While acculturation—the psychosocial, behavioral, linguistic and ideological changes to the individual that result from continuous contact between two cultures [11, 12]—has been found to be an important factor to consider when examining health outcomes for Latino populations, the findings have been mixed and debatable. Some studies indicate that high acculturation has positive outcomes, including higher socioeconomic status, better education, and access to health insurance [13]. At the same time, other studies have indicated that increased acculturation is associated with worse health outcomes, such as alcohol consumption, smoking, diet, HIV risk, and substance use [14, 15]. Furthermore, other studies have found that being less acculturated is a protective factor against substance abuse, sexual risk behavior, depression and stress [6, 15–17].

The relationship of acculturation and health risk behaviors also differs for Latinos depending on the country of origin and socioeconomic status prior to immigration. The Hispanic Health Paradox [18] is the hypothesized phenomenon which contends that despite social, economic, cultural and linguistic disadvantages faced by the newly immigrated, Latinos have fewer negative health outcomes than their US born counterparts, or even non-Latino Whites. As Latino immigrants acculturate to US host culture, they have worse health and mental health outcomes [18, 19]. The Hispanic Health Paradox has been found to be true mainly for Mexican-origin immigrants but not for Puerto Ricans and Cubans and with little evidence for Central Americans. Researchers believe that the Hispanic Health Paradox is attributable to two main factors. (1) Immigrating to a new country is an arduous and taxing undertaking, therefore only sturdy or healthier persons make the migration. (2) That Latino culture, through its closely knit familial structure and traditional familial standards, is in some way protective and insulates the individual, and that deterioration of that culture by time and influence of US culture results in worse health outcomes [20].

Highly acculturated Latinas engage in higher levels of alcohol and drug use, more frequent premarital sex, and have more partners than do less acculturated Latinas [4, 15, 21, 22], although a greater number of sex partners does not inherently translate to HIV risk. Indeed, other studies have found that while less acculturated Latinas have fewer sex partners, they are vulnerable to HIV infection through their partners. Researchers believe that cultural and religious norms and possible domestic violence prevent

Latinas from negotiating condom use in a monogamous relationship [23, 24].

Previous research has demonstrated that coping style is associated with the health and risk taking behaviors of HIV positive persons, including HIV positive women [25–29]. Coping styles are the cognitive and behavioral strategies used to manage internal or external stressors that strain personal resources [30]. According to Namir [31] coping styles are differentiated into three main groups; active-cognitive coping, active-behavioral coping and avoidance coping. Maladaptive coping styles such as avoidant coping styles are associated with sexual risk behavior, drug use and HIV risk behavior, while active coping acts as a protective barrier for HIV risk behavior [26, 27]. Avoidance and self-blame coping styles are associated with increased anxiety and depression, while positive action coping styles are associated with better health outcomes [31]. Previous studies have also found that HIV positive African American and Latina women have employed positive action, spirituality and social support coping styles more often than White women [25, 28]. While the body of knowledge is growing concerning studies that address ethnicity and race when examining coping styles for HIV positive persons [25, 28, 29], studies that have examined race/ethnicity within the context of coping with HIV illustrate the need for more rigorous and in-depth look at the population shift in HIV infection. These studies highlight the importance of examining acculturation differences in use of coping styles of HIV positive Latinas.

Previous research has also demonstrated an association between acculturation and coping styles [32, 33]. In the general population of Latinos, studies have found relations between coping and acculturation—more acculturated Latinos use negative coping styles while less acculturated Latinos use more spiritual and social network coping [34]. In the HIV literature, there have been a handful of studies examining acculturation and coping styles with HIV positive MSM Latinos [7]. More acculturated HIV positive MSM Latinos endorsed more positive action coping and it was related to health-promoting behaviors. Moreover, positive action coping was found to mediate the relationship between higher acculturation and health-promoting behaviors [7]. Unfortunately, to our knowledge no comparable study prior to this paper has examined these relationships among HIV positive Latinas.

As Latinas are an ever-increasing proportion of new HIV/AIDS cases in the United States it is critical to understand what motivates health risk behaviors for these women, how they are coping with the disease, and how their acculturative experiences are associated with coping and behaviors. This study proposes to examine the relationship between acculturation and health risk behaviors of HIV positive Latinas, looking specifically at the role of

coping styles as a mediator in this process. This paper uses structural equation modeling to test the proposed model.

Methods

Participants

From January 2005 to October 2006, 339 mothers/female caregivers living with HIV (MLH) who cared for a child between the ages of 6 and 20 years old were recruited to participate in a family-based HIV-related intervention in Los Angeles, California. The current study uses only those mothers who described themselves as Latinas ($N = 219$). Trained interviewers recruited women from HIV/AIDS clinics, general medical clinics where HIV/AIDS patients received services, HIV/AIDS community based organizations, peer referrals, and from the rosters of previous studies where former participants consented to be approached for subsequent studies. After obtaining informed consent, women completed a 2-h baseline assessment, which included questions about coping styles, sociodemographic information, and acculturation indicators as well as other health-related questions that are not included in the current study. A \$30.00 incentive was provided to complete the interview assessment. University IRB approval was obtained for all study procedures. The study participation refusal rate was 6.4%.

Measures

The analytic method used in this study to assess the mediating role of coping style was structural equation modeling (SEM) using latent variables [35]. Indicators of the latent variables are described below.

Background Demographic Predictors

Age was initially included as a demographic predictor but was not associated with any of the variables in the model and was dropped in the interest of parsimony. A scaled single-item variable representing education was collected and is included as a predictor. It ranged from 1 (*8th grade or less*) to 8 (*college graduate*). The majority of participants had less than an eighth-grade education (53%); only five women reported college degrees (less than 3%).

The *Acculturation* latent variable was indicated by three measured variables: (1) The percentage of her life that she had lived in the United States ($M = 44\%$; $SD = .25$); (2) whether she was born in the US (yes/no) (ten percent were US born); and (3) whether she opted for English when she was administered the baseline assessment (12% chose

English). The items were highly intercorrelated. Coefficient α for the three items = .91. Nativity, time spent in the United States, and language preference are all commonly used markers of acculturation [5, 10, 36, 37].

Mediating Coping Variables

Positive and Negative Coping. The coping style measure was based on a previously validated instrument verified on HIV positive African American women and Latinas, which specifically assesses coping with HIV across seven different sub-scales [38]. The scale was selected because it specifically addresses coping with HIV and taps into HIV specific coping issues. One scale, concerned with *self-destructive escape* which includes substance use items, was not used in this current analysis to avoid a tautological overlap with the substance use outcome measures reflecting cigarette and alcohol use leaving six sub-scales, three of which reflect positive behaviors and three of which reflect maladaptive or negative coping behaviors. Response categories to all items were on a five point Likert scale of frequency of occurrence ranging from: “never” (1) to “always” (5). All items described potential coping mechanisms, which participants addressed by answering the question, “how often have you done any of the following things to help you deal with your illness in the past 6 months?” Average scores for each sub-scale were computed and these means were used as measured indicators of a Positive Coping latent variable and a Negative Coping latent variable.

Positive Coping indicators: (1) *Positive action* consisted of 10 items such as “tried to figure out how to make your mark on the world,” “formed a plan of action in your mind,” and “began solving problems you had avoided before.” (Cronbach’s coefficient α for the 10 items = .87). (2) *Social support* had five items (Coefficient $\alpha = .78$) consisted of items such as: “went to a support group” and “went to a friend or professional to help you feel better.” These items do not reflect social support per se [30], rather they tap the tendency to seek positive support as a coping style. (3) *Spiritual hope* consisted of four items (Coefficient $\alpha = .73$) such as: “trusted your belief in God;” and “started going to your place of worship more often.”

Negative Coping indicators: (1) *Passive problem solving* had six items (Coefficient $\alpha = .72$) and consisted of items such as: “went over the situation again and again in your mind;” and “day-dreamed about better times in the past.” (2) *Depression/withdrawal* consisted of five items (Coefficient $\alpha = .69$) such as “felt depressed and did not want to move” and “hated the world.” (3) *Non-disclosure/problem avoidance* consisted of four items (Coefficient $\alpha = .77$) such as “figured out ways to hide your serostatus from others” and “refused to think about it”.

Outcome Behaviors

Non-Adherence was a three day, day-by-day recall instrument that elicited the number of days adherent in each of the prior 3 days. Responses ranged from 0–3. Previous work has established associations between the three day, day-by-day recall instrument and virologic and immunologic outcomes [39].

Cigarette/Alcohol Use was constructed as a second-order latent variable, which was indicating 2 primary latent variables: (1) use of cigarettes and (2) use of alcohol. Both cigarettes and alcohol were represented by a frequency measure and a quantity measure based on the past 90 days. Data were also collected on illicit substance use. The rates of illicit substance use, however, were so low in this sample that there was insufficient variance for these variables to be used in the model.

Frequency was assessed on a 0–8 scale the same way for cigarettes and alcohol (0 = none, 1 = used only once, 2 = less than 1 day a month, 3 = 1–2 days a month, 4 = 3–4 days a month, 5 = 1–2 days a week, 6 = 3–4 days a week, 7 = 5–6 days a week, 8 = every day or almost every day). Seventeen percent of the women reported smoking in the past 90 days; the mean frequency among the smokers was 5.6 (between 1 and 4 days; SD = 2.5). Fifteen percent of the women reported using alcohol. Among those who drank alcohol, the mean score was 2.5 (between “less than 1 day a month” to “2 days a month”; SD = 1.9).

Quantity of cigarettes was assessed by asking how many cigarettes they smoked per day ranging from 0–6 (0 = none, 1 = at least one puff but less than one cigarette each day, 2 = 1–5 cigarettes each day, 3 = 6–16 cigarettes each day, 4 = 16–25 cigarettes each day (about 1 pack), 5 = 26–35 cigarettes each day, 6 = 36 or more cigarettes (about 2 packs/each day)). Mean use of cigarettes among women who smoked was 2.2, SD = 1.4. *Quantity of alcohol* was assessed on a 0–5 scale and stated, “On the days that you drank, how many drinks did you have per day?” (0 = none, 1 = 1 or 2 drinks, 2 = 3 or 4 drinks, 3 = 5 or 6 drinks, 4 = 7 to 9 drinks, 5 = 10 or more drinks). Drinks were calculated as 12 ounces of beer, one shot of spirits, or one glass of wine. Among women who drank alcohol, the mean was 1.7, SD = 1.0.

Sexual Risk Behavior was indicated by three items: (1) number of unprotected sex acts in the past 6 months with a partner who was HIV negative or of unknown HIV status (range = 0–175; $M = 3.6$, $SD = 17.7$); (2) number of times she had unprotected sex while drinking or taking drugs with the partner who was HIV negative or of unknown HIV status (range = 0–3; $M = .26$, $SD = .62$); and (3) number of unprotected sex acts while partner of

negative or unknown HIV status was drinking or taking drugs (range = 0–11; $M = .59$, $SD = 2.03$) ($\alpha = .68$). All of these variables were highly skewed so they were transformed using the recommended procedure of [40] for variables with that degree of positive skewness.

Analysis

The analyses were performed using the EQS structural equations program [35]. Latent variable analysis allows one to evaluate causal, directional hypotheses with correlational, non-experimental data. Goodness-of-fit of the models was assessed with the maximum-likelihood χ^2 statistic, the Comparative Fit Index (CFI), the Satorra-Bentler χ^2 (S-B χ^2), the Robust Comparative Fit Index (RCFI), and the root mean squared error of approximation (RMSEA). The Robust S-B χ^2 was used in addition to the maximum likelihood χ^2 because it is more appropriate when the data depart from multivariate normality. The multivariate kurtosis estimate was high (z -statistic = 73.26) rejecting multivariate normality. The CFI and RCFI range from 0 to 1 and reflect the improvement in fit of a hypothesized model over a model of complete independence among the measured variables. CFI and RCFI values at .95 or greater are desirable indicating that the hypothesized model reproduces 95% or more of the covariation in the data. The RMSEA is a measure of lack of fit per degrees of freedom, controlling for sample size, and values less than .06 indicate a relatively good fit between the hypothesized model and the observed data.

An initial confirmatory factor analysis (CFA) assessed the adequacy of the hypothesized measurement model and the associations among the latent variables and the single item variables. Then a latent variable path model positioned the background variables of education and Acculturation as predictors of the coping style mediators (Positive Coping and Negative Coping), which in turn predicted non-adherence, Risky Sexual Behavior and Cigarette/Alcohol Use. Initially the model was tested with no direct paths from the background predictors to the outcomes to allow as much mediation as possible through the coping variables. However, we also examined results of the LaGrange Multiplier Test [41], which suggests significant paths that can improve the fit of the model and that should be included in the model. This small amount of post-hoc modification provided more interest to the results and suggested some specific effects that the overall hypothesized model did not anticipate. All additions to the path model are reported in the Results section. We also report the significant indirect effects of all of the background predictors on the outcomes that were mediated through the coping measures.

Results

Demographic Information

The women averaged 39.2 years of age ($SD = 8.2$); 53% reported an 8th grade or less educational level. Twenty-percent had graduated from high school, had a GED, or had any higher education. Average monthly income was \$881 ($SD = 635$). Nearly 10% were born in the United States, 56% were born in Mexico, 11% in El Salvador, and 10% were born in Honduras. The remainder were from other Central and South American countries. They averaged nearly 44% of their lives spent in the United States and about 12% preferred to use English. The average number of years since they received their HIV-positive diagnosis was 7.8 years ($SD = 4.4$); average CD4+ count was 413.01 ($SD = 359.82$). Table 1 reports the summary statistics for all measured variables as well as supplementary demographic information.

Confirmatory Factor Analysis

The factor loadings of the hypothesized factor structure are reported in Fig. 1. All factor loadings were significant ($p \leq .001$). For readability, factor loadings of the measured variables indicating frequency and quantity of cigarette and alcohol use respectively, are not depicted. Those factor loadings were quite high: .91 and .98 for cigarettes and .99 and .83 for alcohol. Fit indexes for the CFA model were excellent: ML χ^2 (113, $N = 219$) = 148.58, CFI = .98, RMSEA = .038, 90% confidence interval for RMSEA (CI) = .018 to .054; S-B χ^2 (113, $N = 219$) = 137.24; RCFI = .98, RMSEA = .031, CI = .000–.048.

Predictive Path Model

The final predictive structural equation model is presented in Fig. 1. Fit indexes were very good: ML χ^2 (122, $N = 219$) = 137.72, CFI = .99, RMSEA = .024, CI = .000 to .043; S-B χ^2 (122, $N = 219$) = 126.20, RCFI = .99; RMSEA = .013, CI = .000–.036. Nonsignificant paths were trimmed gradually following the standard procedure of MacCallum [42]. All nonstandard paths that were suggested by the LM test and added are depicted in the figure. These include a path from education to one particular indicator of Positive Coping, *positive action*. This path was added after it was determined that education was not significantly associated with either Positive or Negative Coping. Education was positively associated with more Acculturation as indicated by the significant correlation (standardized covariance) between those two variables. There were two other non-hypothesized paths that were

Table 1 Descriptive Statistics and summary statistics of variables in model (219 Latinas living with HIV)

Variables	Mean (%)	Standard deviation
Socio-demographics		
Age (years)	39.2	8.2
Monthly income (\$)	880.9	635.5
Education level		
8th grade or less	(53.0)	
Some high school	(27.0)	
High school graduate, GED, or higher	(20.0)	
Country of origin		
Argentina	(0.91)	
Dominican Republic	(0.45)	
Ecuador	(0.91)	
El Salvador	(11.36)	
Guatemala	(8.64)	
Honduras	(10.00)	
Mexico	(55.91)	
Nicaragua	(0.91)	
Peru	(0.91)	
Puerto Rico	(0.45)	
United States	(9.55)	
Disease progression		
Years since diagnosis	7.79	(4.43)
CD4+ count	413.01	(359.82)
Variables in model	Mean (%)	Standard deviation
Education (range 1–8)	2.11	1.86
Acculturation indicators		
Percent born in the US	(9.6)	0.30
Percent of life in the US	(43.6)	0.25
English preferred	(11.9)	0.32
Positive coping (range 1–5)		
Positive action	2.89	0.90
Social support	2.29	0.98
Spiritual	2.99	1.08
Negative coping (range 1–5)		
Passive coping	2.33	0.93
Depression/withdrawal	1.53	0.59
Non-disclosure/avoidance	2.42	1.05
Non-adherence (range 0–3)	0.33	0.79
Cigarette/alcohol use		
Cigarettes last 90 days		
Frequency (0–8)	0.94	2.33
Quantity (0–6)	0.38	1.02
Alcohol last 90 days		
Frequency (0–8)	0.38	1.15
Quantity (0–5)	0.26	0.73

Table 1 continued

Variables in model	Mean (%)	Standard deviation
Sexual risk behavior		
Unprotected (0–175)	3.6	17.7
While high (0–3)	0.26	0.62
While partner high (0–11)	0.59	2.03

added, a direct path between more Acculturation and more Cigarettes and a negative path between Nondisclosure and more Sexual Risk Behavior. These are discussed in more detail below.

As hypothesized, more Acculturation was associated with less Positive Coping and more Negative Coping. In addition, Positive Coping was associated with less Non-Adherence (i.e. positive coping is positively associated with medication adherence) and less Cigarette/Alcohol Use. Positive Coping was not significantly associated with less Sexual Risk Behavior. Negative Coping was associated with all three outcomes. It was associated with more Non-Adherence, more Cigarette/Alcohol Use, and more Sexual Risk Behavior although one of its indicators (Nondisclosure), as reported above, was negatively associated with Sexual Risk Behaviors.

Indirect Effects

As it had been hypothesized that styles of coping with HIV would serve as mediators between the demographic variables and the negative outcomes, indirect effects were examined for significance. Acculturation had significant

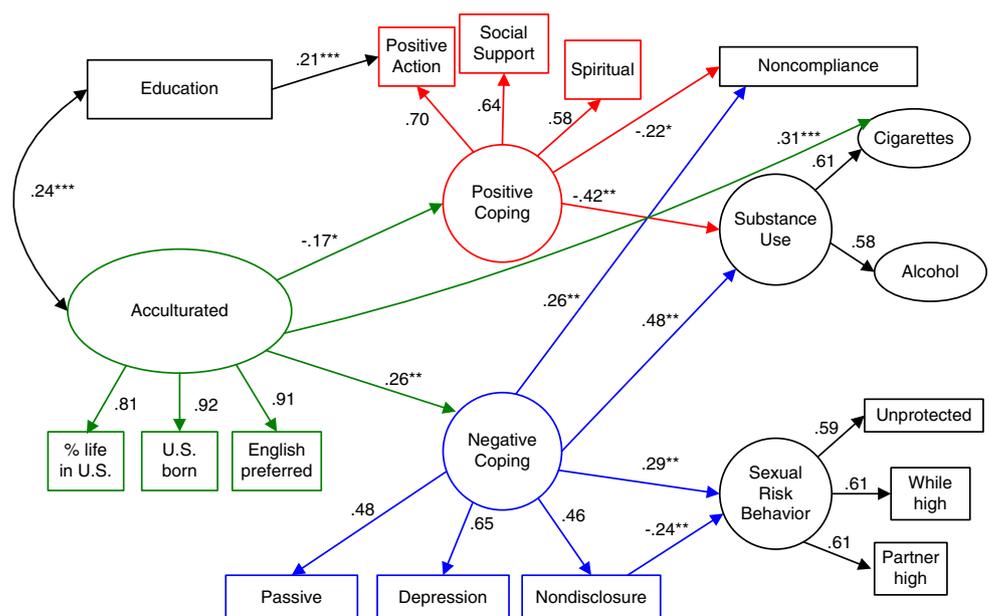
indirect effects on more Non-Adherence ($p \leq .05$, $z = 2.34$) and on more Cigarette/Alcohol Use ($p \leq .05$, $z = 2.28$). These effects were mediated through both Positive and Negative Coping. In addition, the primary latent variables of Cigarettes and Alcohol which indicated the second-order factor of Cigarette/Alcohol Use were also separately associated with greater Acculturation ($p \leq .05$, $z = 2.28$ (cigarettes), $z = 2.34$ (alcohol)), less Positive Coping ($p \leq .05$, $z = -2.37$ (cigarettes), $z = -2.37$, (alcohol)), and more Negative Coping ($p \leq .01$, $z = 2.46$ (cigarettes), $z = 2.48$ (alcohol)) in addition to the direct effect of Acculturation on more cigarette use.

Discussion

There are several important findings that emerged from these data. First, findings from this study support the Hispanic Health Paradox. The Hispanic Health Paradox posits that as Latinos acculturate to the US mainstream culture, they have worse health outcomes than less acculturated Latinos [18]. Evidence for the Hispanic Health Paradox has come primarily from populations of Mexican immigrants. These data, however, show that the Hispanic Health Paradox can be used to describe the behaviors of a heterogeneous group of Latinas which is comprised of a large number of Mexican women as well as women from several nations in Central America. Here, the model indicated that more highly acculturated Latinas were more likely to smoke cigarettes. Previous studies have found that as acculturation increases for Latinas, so does cigarette and alcohol consumption [15, 43–46].

Second, findings from the study indicate that intervening variables of positive and negative coping styles could be

Fig. 1 Significant regression paths and factor loadings among latent and measured variables in the structural equation path model assessing demographic and coping style influences on outcomes among 219 HIV positive Latinas. Regression coefficients or factor loadings (represented as *one-way arrows*) and the correlation between the predictors (represented by a *double-headed arrow*) are standardized (* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)



one possible explanation for the Hispanic Health Paradox. In the current study, coping styles acted as a mediating mechanism in the relationship between acculturation and health risk behavior. The structural equation model indicated that acculturation was associated with the type of coping style employed by the HIV positive Latinas in the sample; more acculturated Latinas used more negative and less positive coping styles, whereas negative coping in turn was associated with more sexual risk behavior, greater non-adherence with HIV medication, and increased substance use, especially cigarettes and alcohol. Positive coping was associated with more adherence and less cigarette and alcohol use. These results echoed findings from previous research with non-HIV positive Latinos that have demonstrated that acculturation was related to coping styles [10, 47]. Moreover, it has been well documented that coping styles are associated with or mitigate health risk and behaviors among HIV positive women [7, 28].

To our knowledge only two other studies [7, 19] have also examined coping as a mediating mechanism to account for the association between acculturation and health behaviors. The two studies are contradictory in terms of the direction between acculturation, coping styles and health risk behavior. According to our findings, which are like those of Farley [19] who examined a sample of male and female Mexican immigrants, Mexican Americans and Whites, acculturation was associated with negative coping style and negative coping was associated with worse health behaviors encompassing non-adherence, cigarette and alcohol use, and risky sexual behavior. Bianchi [7] in a coping study with HIV positive MSM Latinos found that acculturation was associated with more positive action coping, which in turn mediated health-promoting behaviors. The discrepancy between the current study and Bianchi [7] could be due to the ways in which the two different groups (i.e., HIV positive Latinas vs. HIV positive MSM Latinos) experience acculturation. Acculturation is a varied and complex process that is highly individual and is influenced by gender, social class and country of origin. As posited by some researchers [48], higher acculturation could be protective and beneficial to the individual depending on the situation. Perhaps through the process of acculturation, HIV positive MSM Latinos, are exposed to more prevention and coping messages, which are prevalent in the non-Latino specific, HIV positive gay community. For Latinas, however, the process of acculturation may change perceptions about sex risk and substance use.

There are other findings from this study that should be taken into consideration. One noteworthy finding was the direct negative association between non-disclosure and sexual risk behavior. Although negative coping in general was positively associated with more sexual risk behavior and more non-disclosure, non-disclosure was negatively

associated with sexual risk taking. Another finding of note is that more acculturated HIV positive Latinas have had more education. This finding is in keeping with previous studies that have demonstrated that higher socioeconomic status has been related to increases in positive coping styles [25–27].

One limitation of this study was the measure of acculturation which is based on the shared variance among three indicator variables: percentage of time spent in the US, language preference and nativity. This measure of acculturation is a measure of exposure to the receiving culture. Other scales which are based on self-reports of the experiences of acculturation, especially scales that assess adoption of receiving-culture practices could possibly have yielded different results. Despite this limitation, however, the present measure had a high reliability coefficient which increases our confidence in the strength of these results. Moreover, there is face validity to the measure, as language preference and exposure to the host culture are critical components of the acculturation process [11, 12].

A second limitation of this study is that comprehensive data on traditional gender roles and attitudes were not collected from these women. Previous research shows that the acculturative process impacts women's traditional gender roles [7, 23, 24]. Another limitation is the use of self-reported medication adherence. Although the 3 days, day-by-day self report has been used by other researchers, more time-intensive pill count methods as well as special medication bottle-caps which record use could yield more accurate results and greater variation in response [49, 50]. An additional consideration is that the sample is a non-probability sample of women seeking HIV care who are mothers/care-givers of school aged children and adolescents, and who were interested in participating in a family-based intervention. These women are likely to be higher functioning and have more positive coping styles than women who are not seeking HIV care or who do not actively care for children. Moreover, this sample is from Los Angeles and the issues of immigrant women and US born Latinas in Southern California may not be generalizable to other regions.

A clear direction for future research generated by this study is the need for more extensive and subtle assessments of acculturation and how acculturation is associated with coping and health outcomes. There are a great number of possible acculturation measures that exist which would immediately enhance our understanding of this process [36, 51–53]. For example an assessment of acculturation that focuses on the adoption of receiving-culture practices and the retention of culture-of-origin practices could differentiate between the health benefits of retaining culture-of-origin practices relative to the health risks associated with adopting receiving-culture practices for HIV positive

Latinas. The present study also has important implications for intervention research. Future interventions should be developed not only with language in mind, but with a *language* infused of idioms, ideas and examples that reflect how both high and low acculturated HIV positive Latinas construct the world. Treatment interventions should be designed which take into consideration the mediating effects of coping styles (schemas that structure how we interact with the world in stressful situations) on the relationship between acculturation and health risk behavior. The availability of a range of coping resources allows for better choices in terms of the coping styles that are employed [54]. For HIV positive Latinas, what can be influencing the range of coping resources and strategies may be the acculturative experience. Given the complexity of the acculturative process, a focus on coping styles may give providers traction in assisting Latina's living with HIV to live healthier by designing treatment interventions that are respectful and mindful of not just cultural differences, but intra-cultural differences.

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