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Applying Ecodevelopmental Theory and the Theory of Reasoned Action to Understand HIV Risk Behaviors Among Hispanic Adolescents

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Abstract

HIV/AIDS is listed as one of the top 10 reasons for the death of Hispanics between the ages of 15 and 54 in the United States. This cross sectional, descriptive secondary study proposed that using both the systemic (ecodevelopmental) and the individually focused (theory of reasoned action) theories together would lead to an increased understanding of the risk and protective factors that influence HIV risk behaviors in this population. The sample consisted of 493 Hispanic adolescent 7th and 8th graders and their immigrant parents living in Miami, Florida. Structural Equation Modeling (SEM) was used for the data analysis. Family functioning emerged as the heart of the model, embedded within a web of direct and mediated relationships. The data support the idea that family can play a central role in the prevention of Hispanic adolescents' risk behaviors.

Keywords

adolescents; HIV; STIs; ecodevelopmental theory; theory of reasoned action; Hispanics/Latinos

The number of youth in the United States who participate in activities that are considered health risks is truly alarming (Centers for Disease Control and Prevention [CDC], 2008; National Institute on Drug Abuse [NIDA], 2008b). Adolescent alcohol and drug use and unprotected sex presents a major public health concern in the United States (Substance Abuse and Mental Health Services Administration [SAMHSA], 2009). Both the incidence and prevalence of unplanned pregnancy, sexually transmitted infections (STIs), and HIV/AIDS reveal the negative results of the aforementioned behaviors in adolescents, especially in the Hispanic population (National Institute of Drug Abuse [NIDA], 2008a). Hispanics represent not only the largest but also the most rapidly increasing minority ethnic population in the United States, with the median age of this population being 27.7 years in 2008, compared with 36.8 years for the overall U.S. population (U.S. Census Bureau [USCB], 2009). The rates of sexual activity, alcohol and drug use, pregnancy and STIs including HIV/AIDS, are significantly higher among Hispanic high-school-age adolescents as compared to non-Hispanic White adolescents (NIDA, 2008b). Although HIV disparities are narrowing, HIV remains the fourth leading cause of death among Hispanics between the

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ages of 35 and 44. Moreover, HIV/AIDS is listed as one of the top 10 reasons for the death of Hispanics between the ages of 15 and 54. Improving the health of Hispanic youth in the United States requires reducing the incidence and prevalence of risk behaviors (e.g., risky sexual behavior and alcohol and drug use) within this population. However, understanding the processes associated with these risky behaviors is a prerequisite to decreasing their incidence.

Although an extant amount of research has examined the risk and protective factors related to adolescent risky behaviors in non-Hispanic Whites (O'Sullivan, Meyer-Bahlburg, & Watkins, 2001; Stueve & O'Donnell, 2005), only a limited amount of research of this nature has been conducted on Hispanic youth (Prado et al., 2009). Protective factors that can influence adolescent HIV risk behaviors include parents' and adolescent's level of acculturation, parents' HIV knowledge, parent–adolescent communication about sex, family functioning, and adolescents' self-efficacy (Ajzen & Fishbein, 1980; Castrucci & Martin, 2002; Leigh & Stall, 1993; Pantin, Schwartz, Sullivan, Prado, & Szapocznik, 2004; Prado et al., 2010; Santelli, Robin, Brener, & Lowry, 2001; Szapocznik & Coatsworth, 1999). Integrating and combining the multiple social–ecological systems within which an individual resides (ecodevelopmental theory) and the motivational influences that affect individual behavior (theory of reasoned action) would lead to an increased understanding of the risk and protective factors that influence adolescent decision making, with special emphasis on HIV/STI risk in this population. We now briefly review the literature on risk/protective factors, and then we will describe how the two theories are being integrated in this study.

Parents play a significant role in the prevention of HIV/AIDS among adolescents. Knowledge regarding sexuality and the communication skills to effectively facilitate the sharing of this knowledge and other values are important tools for parents in increasing the usefulness of the advice they give to their children. Multiple studies have demonstrated that if mothers believed they possessed the knowledge to respond to questions and the skills set to explain matters clearly, they were more likely to talk to their children about sexual topics, which in turn is associated with reduced HIV risk behaviors (DiClemente et al., 2001; Miller & Whitaker, 2001; Teitelman, Ratcliffe, & Cederbaum, 2008).

Parent–adolescent communication about sex and sexuality appears to be an important determinant of adolescents' sexual behavior (Blake, Simkin, Ledsky, Perkins, & Calabrese, 2001). In another study, DiClemente et al. (2001) investigated the association between parent–adolescent communications regarding sex and the sexual practices of sexually active African American females (n = 522) between the ages of 14 and 18. The findings revealed that less frequency in parent–adolescent communication regarding sex was associated with lack of contraceptive use among these adolescents within the preceding 6 months. Less frequent communications between parents and adolescents were also associated with a higher frequency of not having used condoms at all within the preceding month at last incidence of sexual intercourse and during the preceding five sexual encounters among these adolescents.

The experience of immigration tends to be stressful for children and families (Szapocznik, Prado, Burlew, Williams, & Santisteban, 2007). The immigrant experience begins in a cultural mismatch between the immigrating individual and his or her new society, and the effects of this mismatch can have a significant impact on all levels of a family's or adolescent's social environment (Pantin, Schwartz, Sullivan, Coatsworth, & Szapocznik, 2003). The difference between the parents' and adolescents' degree of acculturation is known as *differential acculturation* (Szapocznik & Kurtines, 1980). Adolescents tend to

quickly adopt the host culture's values and norms, whereas parents' tendency is to remain faithful to those of their birth countries (De la Rosa, Vega, & Radisch, 2000).

Chung et al. (2007) investigated whether acculturation is related to parent–adolescent communications regarding sex in a sample of Filipino American families. Pairs of Filipino American parents (n = 120) and their adolescents at one high school were surveyed. Two measures of acculturation were used: preferential use of the English language and lack of agreement with conventional Asian values. Parents and adolescents who showed larger acculturation gaps communicated less regarding sex.

Acculturation has been found to be associated with HIV knowledge. Loue, Cooper, and Fiedler (2003) conducted a study to measure HIV knowledge levels and to detect factors correlating with HIV knowledge in a sample consisting of heterosexual Mexican and Puerto Rican women and men between the ages of 18 and 45 living in Ohio and in San Diego, California. Greater levels of U.S. acculturation were found to be predictive of higher levels of HIV knowledge (Loue et al., 2003). Similar findings were found by So, Wong, and Deleon (2005), in a study of Asian American students (n = 248) between the ages of 18 and 21. In this study, acculturation was positively correlated with HIV knowledge scores.

A substantial amount of research has been conducted on the relationship between sexual behavior in adolescents and family process variables (e.g., parent–child closeness or connectedness, parental support; Miller, Benson, & Galbraith, 2001). It is apparent that family functioning serves as a mechanism which might account for the probability of the onset of sexual behavior and substance use. Schwartz, Mason, Pantin, and Szapocznik (2008) investigated the relationship between family functioning and the onset of sexual behavior and substance use in Hispanic adolescents (n = 250). Results suggested that positive family functioning is associated with adolescent's abstinence from sexual behavior and substance use.

Self-efficacy can be defined as a person's belief in his or her capability to perform the actions needed to attain specific performance goals (Bandura, 1977). Some studies have showed that adolescents who possess this belief in the efficacy of their own behavior can be more prone to take steps to avoid substance use, STIs, and accidental pregnancies (Halpern-Felsher, Kropp, Boyer, Tschann, & Ellen, 2004; Nash, McQueen, & Bray, 2005; Pearson, 2006). Other studies have found a weak effect of self-efficacy on risk behaviors. For example, Kinard and Webster (2010) conducted a study to explore self-efficacy beliefs as predictors of adolescent unhealthy consumption behavior (alcohol use) in a sample of 101 adolescents from Illinois, Texas, and Washington, DC. Self-efficacy was found as a weak predictor of risk behaviors, more specifically alcohol use.

Researchers have employed several theoretical frameworks in their attempts to organize the risk and protective processes related to STIs and HIV mentioned previously. For example, the theory of planned behavior (Ajzen, 1991), social cognitive theory (Bandura, 1989), Jessor's (1991) theory of adolescent risk behavior, and the theory of reproductive development (Belsky, Steinberg, & Draper, 1991) have been used in multiple studies (Astatke & Serpell, 2000; Kang, Deren, Andia, Colón, & Robles, 2004; Tremblay & Frigon, 2004; Villarruel, Jemmott, Jemmott, & Ronis, 2007). The majority of the studies found in the literature have focused on examining risk and protection factors from one theoretical perspective. In this study, we examined the risk and protective factors by integrating elements from two perspectives, the ecodevelopmental theory (Szapocznik & Coatsworth, 1999) and the theory of reasoned action (Ajzen & Fishbein, 1980). We now briefly describe each of these theoretical frameworks.

Ecodevelopmental theory (Szapocznik & Coatsworth, 1999) is composed of three integrated elements: (a) social–ecological theory, (b) developmental theory, and (c) an emphasis on social interactions. The first element of ecodevelopmental theory, social–ecological theory, is based on Urie Bronfenbrenner's (1979) social–ecological model. Bronfenbrenner's theory conceptualizes the social ecology of the individual as a set of four interacting systems and is usually represented as a series of concentric circles, with the adolescent at the center. The four systems are known as the microsystem, mesosystem, exosystem, and macrosystem.

At the first or innermost level are the microsystems, which are the immediate social settings or contexts inhabited by the adolescent, as well as the adolescent's relationships within these contexts. These relationships have the power to impact the adolescent's values or behaviors either in a healthy or dysfunctional direction. Family and peer systems are highly influential microsystems in the life of the adolescent. At the next level of the social ecology are the mesosystems, which represent the interface or sphere of interactions between two or more microsystems. Examples of mesosystems are the overlap between the family and the school microsystems (e.g., parental involvement in schools) or the family and peer microsystems (e.g., parental monitoring of peers). The exosystem is the next level of the social ecology. The exosystem is the system in which the adolescent does not participate in directly, but in which members of the adolescent's microsystems (e.g., parents) participate in directly (e.g., highly stressful workplaces and limited social support networks could make it very difficult for parents to engage in their adolescents' school activities or to effectively monitor their adolescents' peer groups). The outer level of individuals' social ecology is the macrosystem. The macrosystem may be defined as the philosophical and social ideas that describe a particular culture or subculture (Pantin et al., 2004). In the case of Hispanic immigrant families, the predominant difficulty at the macrosystemic level centers around the incompatibilities between American and Hispanic culture (e.g., acculturation gap between parents and adolescents).

The second element of ecodevelopmental theory (Szapocznik & Coatsworth, 1999) is composed of a developmental perception that stresses the tendency of adolescents to evolve across time, as a function not only of their current social contexts but also as a function of evolving factors within these youths' social existence. For example, substance abuse among adolescents, which is predictive of risky sexual behavior (NIDA, 2008a), is influenced not only by an adolescent's current social context but also by former levels of family support that have existed in the individual's life (Prado et al., 2007).

The third element of ecodevelopmental theory (Szapocznik & Coatsworth, 1999) consists of social interactions. According to this perspective, individuals express risk and protection via their relationship patterns, as well as by their direct transactions across and within the various contextual levels that characterize their social ecology (Szapocznik & Coatsworth, 1999). For example, acculturation gap is an important construct of ecodevelopmental theory (Prado, Szapocznik, Schwartz, Maldonado-Molina, & Patin, 2008).

The theory of reasoned action (Ajzen & Fishbein, 1980) is based on four key constructs that help to explain how and why individuals, including adolescents, engage in specific behaviors in response to specific situations. These four constructs are behaviors, intentions, attitudes, and subjective norms. The theory postulates that a person's intention to engage in a specific behavior is based on two factors: (a) the attitude the individual holds about the behavior, and (b) the subjective norms that he or she associates with the behavior (Albarracín, Johnson, Fishbein, & Muellerleile, 2001). For example, an adolescent who believes that his or her friends approve of using condoms (subjective norm), and who values the opinion of these friends, is more likely to form a strong intention to use condoms when engaging in sexual activity (Albarracín et al., 2001). At the same time, if the adolescent

knows that using a condom can protect him or her from contracting HIV or another STI, and understands that such protection is important, he or she is more likely to hold a positive attitude regarding the use of condoms.

Clearly, both ecodevelopmental theory (Szapocznik & Coatsworth, 1999; Pantin et al., 2004; Prado et al., 2010) and Ajzen and Fishbein's (1980) theory of reasoned action have made important contributions to the literature in terms of providing theoretical frameworks for organizing risk and protective factors related to HIV and STIs. Ecodevelopmental theory's focus on the multiple social–ecological systems within which an individual resides, provides a useful and important context from which to analyze adolescent risk behaviors (Pantin et al., 2003; Pantin et al., 2004; Prado et al., 2007). The theory of reasoned action, with its emphasis on the motivational influences that affect individual behavior, has also been extensively referenced by social psychologists attempting to arrive at an understanding of decision making regarding healthy or unhealthy behaviors (Madden, Ellen, & Ajzen, 1992). In this study, for first time, both theories are combined to explore the risk and protective factors that can influence adolescent HIV risk behaviors.

Hypothesized Theoretical Model and Study Hypothesis

This study tested the theoretical model hypothesized in Figure 1. This model integrates ecodevelopmental theory and the theory of reasoned action. It was proposed that integrating and combining the multiple social–ecological systems within which an individual resides (ecodevelopmental theory) and the motivational influences that affect individual behavior (theory of reasoned action) would lead to an increased understanding of the risk and protective factors that influence adolescent decision making, with special emphasis on HIV/STI risk in this population. The study examined the following predictors of adolescent risk behaviors relevant to ecodevelopmental theory: family functioning, parents' acculturation, differential acculturation (between adolescents and parents), parents' HIV knowledge, parent–adolescent communication about sex; and the following predictor relevant to the theory of reasoned action: adolescent condom use self-efficacy. The following three hypotheses were tested:

H1 Family functioning, parent–adolescent communication about sex, and adolescent self- efficacy will be directly related to adolescent risk behaviors (e.g., drug use, unprotected sexual behavior).

H2 Parents' acculturation will be related to adolescent risk behaviors indirectly through its association with (a) parents' HIV knowledge and (b) parent–adolescent communication about sex. More specifically, two subhypotheses were tested:

- **H2a** The effect of parents' acculturation on adolescent risk behaviors will be partially mediated by parents' HIV knowledge and parent–adolescent communication about sex.
- **H2b** The effect of parents' acculturation on adolescent risk behaviors will be partially mediated by parent–adolescent communication about sex.

H3 Differential acculturation will be related to adolescent risk behaviors indirectly through its association with: (a) family functioning, (b) parent–adolescent communication about sex, and (c) adolescent self-efficacy. More specifically, three subhypotheses were tested:

- **H3a** The effects of differential acculturation on adolescent risk behaviors will be partially mediated by family functioning.

H3b The effects of differential acculturation on adolescent risk behaviors will be partially mediated by parent–adolescent communication about sex.

H3c The effects of differential acculturation on adolescent risk behaviors will be partially mediated by adolescent self-efficacy.

Method

Recruitment

This study used baseline data from two randomized controlled clinical trials (Pantin et al., 2009; Prado et al., 2007), evaluating the relative efficacy of *Familias Unidas*, a family-based preventive intervention, in preventing and reducing substance abuse and unsafe sexual behavior in Hispanic adolescents. Both studies were approved by the University of Miami's Social/Behavioral Sciences Institutional Review Board as well as by the research committee of the Miami-Dade County school board. The baseline data used in this study were collected from adolescent study participants and their parents or legal guardians before they were randomized into the study conditions.

In both studies, adolescent participants were recruited from three middle schools with a high proportion of Hispanic students. However, although the first efficacy study consisted of a selected sample of Hispanic youth, the second efficacy study consisted of an indicated sample behavior problem of Hispanic adolescents. In this latter study, only participants who were identified as exhibiting at least mild behavior problems by their school counselors were eligible for participation.

A combined total of 586 Hispanic adolescents participated in the two studies from which the data for this study was derived. Of these, 55.3% were male and 44.7% were female, with a mean age of 13.6 years ($SD = 0.75$). Almost half (46%) of the adolescents were born in the United States. Of the 54% of adolescents who were born in other countries, 33.8% were from Cuba, 23.6% were from Nicaragua, and 13.7% were from Honduras. Additionally, of the adolescents who were born in other countries, a significant number ($n = 137$; 43.5%) were relatively recent immigrants who had been living in the United States for less than 3 years. An additional 39.3% of the adolescents had been living in the United States for at least 3 years and as many as 10 years ($n = 123$). Finally, a small number of adolescents ($n = 54$; 17.3%) had been in the United States for more than 10 years.

Measures

All of the measures were translated into Spanish for use in previous studies. Although the adolescents and parents who participated in the *Familias Unidas* efficacy studies completed an extensive number of measures, only a subset of these measures were used in this study. The constructs used were (a) adolescent condom use self-efficacy, (b) family functioning, (c) parents' acculturation, (d) differential acculturation, (e) parents' HIV knowledge, (f) parent–adolescent communication about sex, and (g) adolescent risk behaviors.

Adolescent condom use self-efficacy (10 items, $\alpha = .88$) was assessed using the corresponding subscales from Jemmott, Jemmott, and Fong's sexual behavior measure (1998). Adolescents are asked to respond to 10 items on a four-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Sample items include: "*I am sure that I can use a condom if I have sex*." The adolescent condom use self-efficacy subscale score is the sum of the adolescents' responses to each of the 10 items. Where appropriate, items are reverse-coded so that a higher score represents higher adolescent self-efficacy.

Family functioning was assessed using adolescent reports of four indicators: (a) parental involvement (11 items, α = .93), (b) positive parenting (6 items, α = .94), (c) family communication (3 items, α = .75), and (d) parent–adolescent communication (20 items, α = .88). Parental involvement and positive parenting were assessed using the corresponding subscales from the Parenting Practices Scale (Gorman-Smith, Tolan, Zelli, & Huesmann, 1996). Family communication was assessed using the corresponding subscale from the Family Relations Scale (Tolan, Gorman-Smith, Huesmann, & Zelli, 1997). Parent–adolescent communication was measured using the Parent–Adolescent Communication Scale, which assesses the quality and content of open (i.e., positive) and closed (i.e., negative) communication between adolescents and their parents (Barnes & Olson, 1985).

Parents' acculturation was measured using the Bicultural Involvement Questionnaire-Revised (BIQ-R; Birman, 1998). The BIQ-R assesses the degree to which an individual is oriented towards Americanism (American cultural orientation) or Hispanicism (Hispanic cultural orientation) across various dimensions such as personal preference in the use of the English or Spanish language in various settings.

This study used the American subscale to obtain measures of the parents' (20 items, α = .93) and adolescents' (20 items, α = .92) level of Americanism and the difference between them to assess the parent–adolescent Americanism gap (i.e., differential acculturation). Thus, the parent–adolescent Americanism gap score was computed by subtracting the parent's Americanism score from the adolescent's Americanism score.

Parents' HIV knowledge (50 items, α = .91) was assessed using the 50-item "HIV Knowledge Survey" (Krauss, Tiffany, & Goldsamt, 1997). The survey assesses parental knowledge about HIV across multiple content areas, including local and general HIV prevalence, HIV risk, HIV prevention measures and their efficacy, HIV transmission, and the natural history and course of the disease. Parents were asked to respond to each of the 50 items as being "true" or "not true." The "parent HIV knowledge" subscale score is the sum of the parent's correct responses to each of the 50 items.

Parent–adolescent communication about sex (14 items, α = .87) was assessed using the corresponding sub-scales from the Mother–Daughter Communication about Sexuality Scale (O'Sullivan, Jaramillo, Moreau, & Meyer-Bahluburg, 1999). Adolescents were asked to respond to 14 items on a four-point Likert scale ranging from 1 = *strongly agree* to 4 = *strongly disagree* Sample items include: "My (parent/parent figure) has talked to me about sex." and "I can discuss sex with my (parent/parent figure) without feeling embarrassed." The "parent–adolescent communication about sex" subscale score is the sum of the adolescent's responses to each of the 14 items. Where appropriate, items are reverse-coded so that a higher score represents more open (or more positive) parent– adolescent communication about sex.

Sexual risk behaviors were measured using items from Jemmott, Jemmott, and Fong's Sexual Behavior instrument. Adolescents who reported having had sex in the past 90 days were asked how often were condoms used on a five-point Likert scale ranging from 1 = *never* to 5 = *everytime*. Adolescents who reported having had sex in the past 90 days were also asked on how many days did they get high on alcohol or another drug and then have sexual intercourse.

Alcohol and drug use was assessed using items similar to those used in the Monitoring the Future study, a national epidemiological study to assess the prevalence of alcohol and drug use in the United States. Adolescents in both studies were asked whether they had ever smoked, drank alcohol, or used an illicit drug in their lifetime and in the past 90 days. More specifically, four items were used to assess alcohol and drug use: (a) Have you ever had any

beer, wine, coolers, or liquor to drink—more than just a few sips?; (b) On how many occasions (if any) have you had alcohol to drink—more than just a few sips—in the past 3 months?; (c) Have you ever used drugs?; and (d) On how many occasions (if any) have you used (name of the illicit drug) during the past 3 months? Only adolescents who responded "yes" to the lifetime alcohol use or to the lifetime drug use items were then asked about their use of alcohol and/or drugs during the past 3 months. Adolescents who responded "yes" to having used an illicit drug were asked about the frequency of their use of 13 specific drugs including marijuana, cocaine, amphetamines, methamphetamines, and barbiturates.

Data Analytic Plan

The analysis plan for this study consisted of the following steps. First, measurement models were estimated to ascertain the feasibility of collapsing multiple indicators of family functioning and HIV/STIs risk behaviors into single latent variables (all other variables were measured using observed variables). This was achieved by conducting confirmatory factor analysis (CFA) using Mplus version 5.1 (Muthén & Muthén, 1998–2006). CFA allows the study of relationships between the observed variables and their underlying latent constructs (Keith, 2006).

Finally, the hypothesized structural equation model (SEM) was estimated (see Figure 1). The fit of the model was evaluated primarily in terms of the comparative fit index (*CFI*), which compares the hypothesized model to a null model with no paths or latent variables, and the root mean square error of approximation (*RMSEA*), which estimates the extent to which the covariance matrix specified in the model deviates from the covariance matrix observed in the data. *CFI* values of .95 or greater and *RMSEA* values of .06 or less are indicative of good model fit (Byrne, 2001).

After estimating the SEM model, beta coefficients were calculated to examine direct effects (i.e., H1). The direct effect reflects the influence of the independent variable on the dependent variable (Polit, 1996). MacKinnon's (2008) asymmetric distribution of product test was used to evaluate mediation (i.e., H2, H3). This test is based on the sampling distribution of the product of the path that contains the hypothesized mediating pathway and has been revealed to be more powerful than more traditional/conventional methods (Fritz & Mackinnon, 2007). This test computes the product of the two unstandardized path coefficients that contain the mediating pathway. Partial mediation is assumed if the 95% confidence interval for the product does not include zero.

Results

Measurement Models

Family Functioning—A CFA indicated that all four indicators of family functioning loaded significantly on a single latent construct. The loadings were .42, .98, .78, and .67 for parent–adolescent communication, parent involvement, positive parenting, and family communication, respectively. The fit statistics are not reported because the model was saturated (i.e., degrees of freedom = 0).

Structural Equation Model-Hypothesized Model

Overall, the hypothesized model depicted in Figure 2 provided an adequate fit to the data (c2 [33] = 81.76, $p < .001$; *CFI* = .92; *RMSEA* = .05). Figure 2 shows the actual model of relationships among the variables that emerged from the test of the proposed model. The results of the proposed model are presented that follows.

Hypothesis 1	The test of the proposed model failed to confirm the hypothesis. However, the test of one of the three proposed pathways, family functioning, and adolescent risk behaviors did yield a significant outcome ($\beta = 0.02$, $p < .01$).
Hypothesis 2	The test of the proposed model failed to confirm the hypothesis.
Hypothesis 3	The test of the proposed model failed to confirm the hypothesis.

Post Hoc Analyses

Because the hypothesized mediating pathways were not significant, post hoc analyses were conducted to explore whether family functioning mediated the effects of parents' acculturation and parents' HIV knowledge on adolescent risk behaviors. The first of the two new mediated pathways suggests that family functioning mediates the effect of parents' acculturation on adolescent risk behaviors, with a significant and inverse relationship for the pathway from parents' acculturation to family functioning ($\beta = 0.24$, $p < .01$), and in turn, with a significant and inverse relationship for the pathway from family functioning to adolescent risk behaviors ($\beta = 0.02$, $p < .01$; see Figure 2).

The second of the two new mediated pathways suggests that family functioning mediates the effect of parents' HIV knowledge on adolescent risk behaviors, with a significant and positive relationship for the pathway from parents' HIV knowledge to family functioning ($\beta = 0.33$, $p < .01$), and in turn, with a significant and inverse relationship for the pathway from family functioning to adolescent risk behaviors ($\beta = 0.02$, $p < .01$; see Figure 2).

Discussion

The purpose of this study was to evaluate a model that combined elements of ecodevelopmental theory and theory of reasoned action, to investigate individual and social factors that affect the risk behaviors of Hispanic adolescents in the United States. The data lend support to one of the three direct effects variables. More specifically, the findings suggest that higher levels of family functioning are related to lower levels of adolescent risk behaviors. Moreover, family functioning, as both a direct and mediating variable, was significantly related to all of the study variables with the exception of differential acculturation. This finding highlights the central role of family functioning within the study model and is discussed in detail in the following section. The fact that the adolescent self-efficacy variable was not significantly related to adolescent risk behaviors corroborate with the results of the study done by Kinard and Webster (2010), which reported that self-efficacy was not a predictor of alcohol abuse.

The lack of significant results in this study can be attributed to different factors. Although reliability analyses of adolescents' condom use self-efficacy measure did yield a significant Cronbach's α coefficient, there are other issues of concern regarding this measure. The self-efficacy instrument used in this study measured the adolescent's intention to use condoms while having sex. A different instrument, which could measure the adolescent's intention to use alcohol and/or to use drugs, might yield different results. Another factor that could have affected the result is the low rate of adolescents who reported being engaged in high-risk behaviors.

Parent–adolescent communication about sex was also found not to be significantly related to adolescent risk behaviors as proposed in hypotheses 1 and 2. As discussed previously, the low rate of adolescents reporting drug use, alcohol use, and being sexually active could have affected the results. In the present sample, 14.8% reported ever having used drugs, 23% reported ever having used alcohol, and 12.8% reporting having had oral, vaginal, or anal

sex. These rates of alcohol use, drug use, and sexual behaviors are lower than the rates reported by other population-based studies for Hispanics. Another factor that could have influenced the failure to find an effect of parent–adolescent communication about sex on adolescent's risk behaviors, could be attributed the fact that the more general parent–adolescent communication variable was part of the family functioning latent construct.

Hypothesis 3 and its three subhypotheses were not entirely supported by the data. However, previous research demonstrates that significant differences in the degree of acculturation between parents and adolescents does impact various outcomes (Chung et al., 2007; Prado et al., 2010). A more detailed look at the data might reveal differential results for families in which parents are more acculturated as compared to families in which adolescents are more acculturated.

Post hoc pathway 1 suggests that family functioning mediates the effect of parents' acculturation on adolescent risk behaviors. More specifically, it was found that higher levels of parents' orientation to American culture are related to lower levels of family functioning, and in turn, lower family functioning are related to higher levels of adolescent risk behaviors. This suggests that parents who are more acculturated to the American culture may experience a sense of distance or isolation within their own families, and corresponding impediments to becoming or remaining involved in their adolescents' lives. Future research might explore the mechanisms behind this pathway to identify whether parents who are more acculturated to the American culture will be more disconnected from their families.

Post hoc pathway 2 suggests that family functioning mediates the effect of parents' HIV knowledge on adolescent risk behaviors. More specifically, in our study, higher levels of parents' HIV knowledge were related to higher levels of family functioning, whereas higher levels of family functioning were in turn related to lower levels of adolescent risk behaviors. What might be inferred from this finding?

One possibility is that parents' being more informed about HIV might serve as an indicator of parents' likelihood of being more informed about other matters relevant to their adolescents such as incidence and prevalence of drug abuse at school or neighborhood and recognizing signs and symptoms of intoxication. In turn, these more informed parents might be more likely to be involved in the life of their adolescent and family in a positive and strengthening manner. Future research might explore the mechanisms behind this pathway to identify whether parents who are more informed about critical matters such as HIV also demonstrate more effective parenting skills. Future research might also explore what other specific content areas of parent knowledge, and/or what other specific parent competencies, might serve as indicators of parents' commitment to and positive involvement with their adolescents and families.

Further, it may be that these relationships play out in complex ways that involve diverse interacting variables. For example, although our study model seems to suggest that parents who are more informed about HIV might also be more likely to demonstrate other positive competencies as parents, the study also revealed that the relationship between parents' HIV knowledge and parent–adolescent communication about sex was not significant. This suggests that parents who are more informed about HIV are not more (or less) likely to communicate with their adolescents about sex as compared to parents who are less informed about HIV. Therefore, although parents who are more informed about HIV might demonstrate other important and positive competencies as parents, their ability or inclination to communicate with their adolescents about sex does not appear to be one of these competencies.

Additional observation of the study model reveals that the family functioning construct is at the heart of the model, embedded within a web of direct and mediated relationships and pathways. This finding is consistent with research that emphasizes the centrality of the family within the Hispanic culture (Prado et al., 2007; Santisteban, Suarez-Morales, Robbins, & Szapocznik, 2006). More specifically, higher levels of family functioning are significantly related to all of the other variables in a positive direction, that is, stronger or more positive levels of family functioning are related to stronger or more positive levels of the other study variables, including the outcome variables. This finding has significant implications for the development of interventions to prevent and/or address the problem of adolescent risk behaviors. This finding correlates with a study done by Prado and colleagues (2007) in which they evaluated the efficacy of a parent-centered intervention in preventing adolescent drug use and risky sexual behavior. The findings suggest that improving family functioning is critical in preventing substance use and unsafe sex in Hispanic adolescents. This finding has significant implications for the development of interventions to prevent and/or address the problem of adolescent risk behaviors.

Limitations

There are several limitation that we should address in this study. First, because of the cross-sectional design of the study, it is not possible to draw any causal or directional inferences from the results. Thus, although post hoc analyses suggest that there are significant relationships between and among some of the variables in the model, it cannot be assumed that these are causal relationships or that the direction of these relationships can be determined. It will be up to future research to help to clarify our understanding about the causality or directionality of these relationships.

A second limitation is the use of a convenience sample. This study looked at a population of Hispanic immigrant families living in South Florida. Therefore, the study results cannot be generalized to the broader Hispanic adolescent population in the United States or to any of its specific nationalities or other subgroups. A third limitation is that parents and adolescents completed self-report measures about themselves and their families. It is possible that some of the respondents were unwilling to answer some of the items in a completely truthful manner, especially when responding to items of a sensitive nature. For example, some adolescents might not have felt safe in responding honestly to items about drug and alcohol use and/or about all or some types of sexual behavior.

Conclusion and Practical Implications

The study suggests that family can play a central role in the conceptualization and theoretical foundation of community prevention efforts. This finding correlates with a study done by Prado and colleagues (2007) in which they evaluated the efficacy of a parent-centered intervention in preventing adolescent drug use and risky sexual behavior. Several issues are important to consider when developing a HIV/STIs prevention program. The program should be family-focused and parent-oriented. Prevention and clinical intervention programs should be designed with the input of parents, adolescents, and key community members who play an important role in the life of the adolescent.

The replication of this study in a population at higher risk might yield different results. Future research might explore the relationship between family functioning and adolescent risk behaviors to better understand the nature of the central role played by the family in impacting adolescent outcomes. Again, this finding highlights the centrality of the family within the Hispanic culture and emphasizes the importance of ensuring that interventions with this population are built around family-oriented models.

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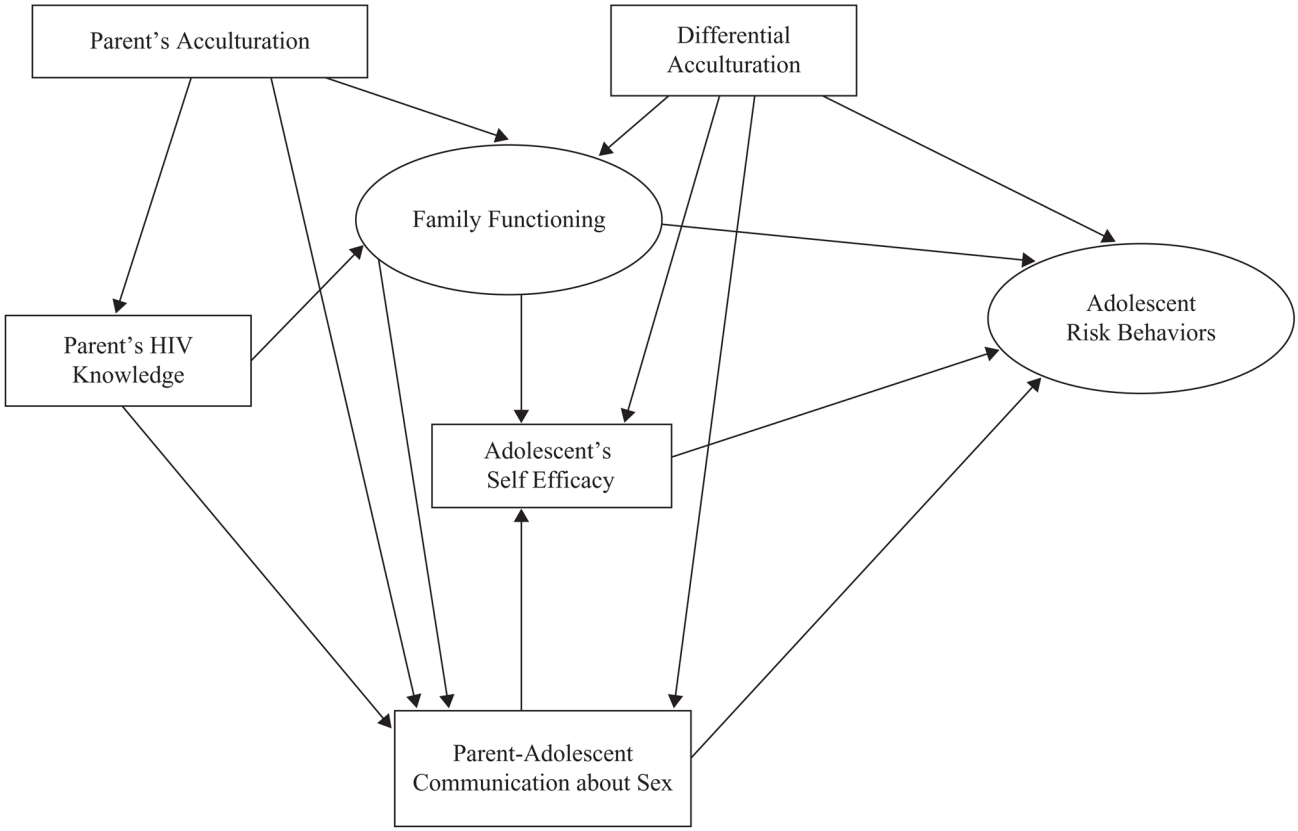

Figure 1.
Hypothesized model of relationship.

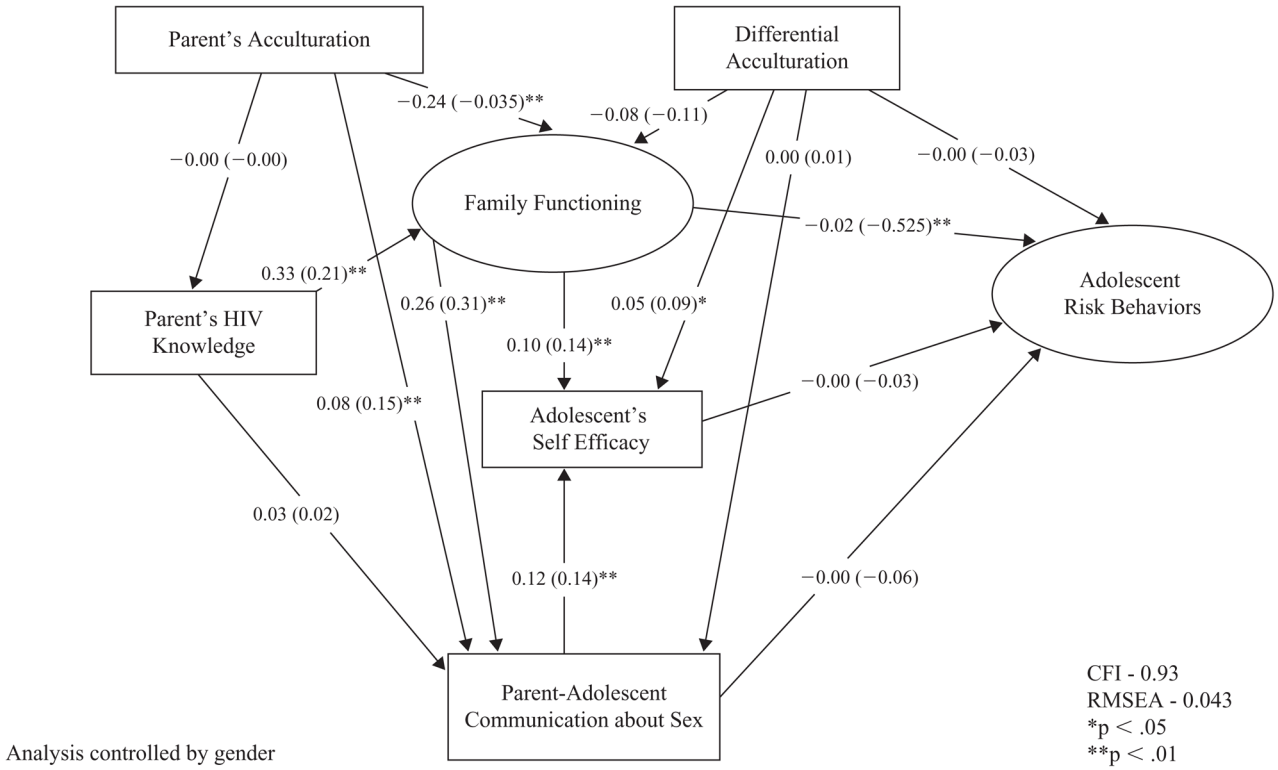

Figure 2.
Hypothesized model of relationships predicting adolescent-risk behaviors.