

A Randomized Controlled Trial of a Parent-Centered Intervention in Preventing Substance Use and HIV Risk Behaviors in Hispanic Adolescents

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The present study evaluated the efficacy of Familias Unidas + Parent–Preadolescent Training for HIV Prevention (PATH), a Hispanic-specific, parent-centered intervention, in preventing adolescent substance use and unsafe sexual behavior. Two hundred sixty-six 8th-grade Hispanic adolescents and their primary caregivers were randomly assigned to 1 of 3 conditions: Familias Unidas + PATH, English for Speakers of Other Languages (ESOL) + PATH, and ESOL + HeartPower! for Hispanics (HEART). Participants were assessed at baseline and at 6, 12, 24, and 36 months postbaseline. Results showed that (a) Familias Unidas + PATH was efficacious in preventing and reducing cigarette use relative to both control conditions; (b) Familias Unidas + PATH was efficacious, relative to ESOL + HEART, in reducing illicit drug use; and (c) Familias Unidas + PATH was efficacious, relative to ESOL + PATH, in reducing unsafe sexual behavior. The effects of Familias Unidas + PATH on these distal outcomes were partially mediated by improvements in family functioning. These findings suggest that strengthening the family system, rather than targeting specific health behaviors, may be most efficacious in preventing and/or reducing cigarette smoking, illicit drug use, and unsafe sex in Hispanic adolescents.

Keywords: prevention, HIV, drugs, smoking, Hispanic

Substance use and HIV/AIDS represent major public health problems facing America's youths (Centers for Disease Control and Prevention, 2006a; Johnston, O'Malley, Bachman, & Schulenberg, 2007).¹ Both substance use and sexual behavior are often initiated in adolescence (Guo et al., 2002) and are associated with compromised developmental outcomes, including unplanned pregnancy, sexually transmitted diseases (including HIV), and school dropout (Rosenthal, Biro, Succop, Baker, & Stanberry, 1994; Smith, 1997).

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Early substance use and sexual behavior, along with the outcomes with which these behaviors are associated, such as substance abuse and dependence (Gil, Wagner, & Tubman, 2004) and HIV infection (Prado et al., 2006), are not evenly distributed across ethnic groups. Hispanic adolescents report higher use across all drug categories (with the exception of amphetamines; Johnston et al., 2007) and also engage in higher rates of unprotected sexual intercourse than do non-Hispanic White and African American adolescents (Centers for Disease Control and Prevention, 2006b).² Compared with non-Hispanic Whites, Hispanics are also disproportionately represented among HIV/AIDS cases, accounting for 18% of all such cases in the United States in 2004 (Centers for Disease Control and Prevention, 2006a).

These disparities are especially disconcerting because Hispanics are the largest and fastest growing minority group in the United States (Ramirez & de la Cruz, 2003), representing 14% of the population. Moreover, Hispanics accounted for approximately half of all U.S. population growth between 2000 and 2006 (Bernstein, 2007). Hispanics are also a youthful population, with more than one third under the age of 18 (Marotta & Garcia, 2003). Preventing

¹ *Substance use* refers to the use of tobacco, alcohol, and illicit drugs.

² The term *Hispanic* is used to be consistent with the terminology used by the U.S. Census Bureau. However, it is intended to include individuals living in the United States from a vast variety of backgrounds, some of whom may identify themselves as Latinos/Latinas or Chicanos/Chicanas.

these problems in Hispanic adolescents is therefore of vital importance.

Despite the facts that (a) unsafe sexual behavior and substance use are so prominent among Hispanic adolescents and (b) both of these behaviors are directly associated with HIV contraction, few substance use (see Szapocznik, Prado, Burlew, Williams, & Santisteban, 2007) and HIV (see Prado et al., 2006) preventive interventions have been developed and tested specifically for Hispanic adolescents. The purpose of the present study was to evaluate the efficacy of a Hispanic-specific intervention designed to prevent substance use and unsafe sexual behavior in Hispanic adolescents. Culturally specific interventions are those that are tailored toward a specific ethnic group and that integrate culture into one or more of the intervention components (Prado, Szapocznik, Schwartz, Maldonado-Molina, & Pantin, in press). Scant research has examined the degree to which cultural specification might improve the impact of empirically supported interventions, and more research is clearly needed in this area (Nagayama Hall, 2005).

Risk and Protective Factors for Adolescent Substance Use and Unsafe Sexual Behavior

Many of the most powerful protective mechanisms against adolescent substance use and unsafe sexual behavior are within the family. These include parental involvement (Vakalahi, 2002), positive parenting (e.g., positive reinforcement for good behavior; Ellickson & Morton, 1999), family support (Henrich, Brookmeyer, Shrier, & Shahar, 2006), and parent–adolescent communication (Meschke, Bartholomae, & Zentall, 2000). It is not surprising that family-based interventions are especially efficacious in reducing risk and increasing protection against substance use and HIV risks (e.g., Pantin et al., 2003; Tobler et al., 2000). Family is especially important among Hispanics (Santisteban, Muir-Malcolm, Mitrani, & Szapocznik, 2002), for whom familism (e.g., use of family as a source of emotional support) is an integral part of the culture. As a result, preventive interventions for Hispanics should be family based.

Familias Unidas

Familias Unidas (United Families; Pantin et al., 2003; Pantin, Schwartz, Sullivan, Prado, & Szapocznik, 2004) is one of the few interventions (see Szapocznik et al., 2007, for a review) that are efficacious in increasing parental involvement, positive parenting, and family support in Hispanic families. Familias Unidas proceeds from the assumption that parental involvement, positive parenting, parent–adolescent communication, and family support are essential to promoting positive adolescent development and to preventing substance use and unsafe sex (Pantin et al., 2004). Familias Unidas is a parent-centered intervention, in which the vast majority of components are delivered directly to parents. Consistent with Hispanic cultural expectations, Familias Unidas places parents in positions of leadership and expertise and builds on pan-Hispanic values, such as primacy of family, sanctity of parental authority, and roles of parents as the family's leaders and educators (Santisteban et al., 2002). Hispanic-specific cultural issues are integrated in all aspects of the intervention, from the underlying theoretical model to the specific content of the intervention to the format of the intervention activities.

In the present study, we evaluated the combination of Familias Unidas and Parent Preadolescent Training for HIV Prevention (PATH; Krauss et al., 2000) in preventing both substance use and unsafe sex in Hispanic adolescents. Whereas Familias Unidas focuses on improving family functioning, PATH focuses specifically on increasing parent–adolescent communication about sex and HIV risks (Krauss et al., 2000). PATH, however, does not target positive parenting or communication skills, which may be a necessary prerequisite to initiating parent–adolescent discussions about sexuality and HIV. Given Hispanic cultural taboos against discussing sexuality and HIV (Gomez & Marin, 1996), it may be important to strengthen the family system before addressing sexuality and HIV. It was therefore important to test whether the efficacy of PATH in preventing substance use and unsafe sex in Hispanic adolescents depends on whether it is embedded within a family-strengthening intervention (i.e., Familias Unidas).

The Current Study

The purpose of the current study was twofold. The first aim was to investigate whether Familias Unidas + PATH would be efficacious relative to two control conditions in (a) preventing substance use and unsafe sexual behavior in Hispanic adolescents and (b) improving family functioning (parental involvement, parent–adolescent communication, positive parenting, and family support). The second aim was to examine whether and to what extent improvements in family functioning would mediate the effects of intervention condition on substance use and unsafe sexual behavior. In both control conditions, English for Speakers of Other Languages (ESOL) was used as an attention control for Familias Unidas. In the second control condition, HeartPower! for Hispanics (HEART; American Heart Association, 1996) was used as an attention control for PATH. The term *attention control* is used to refer to a module intended to provide equivalent amounts of dosage and participant–facilitator contact. The randomized controlled trial therefore consisted of the following three conditions: (a) Familias Unidas + PATH, (b) ESOL + PATH, and (c) ESOL + HEART.

Four study hypotheses were advanced. Consistent with Sandler, Ayers, and Wolchik (2003), hypotheses pertaining to family functioning, the proximal outcome targeted in Familias Unidas, were examined in terms of change trajectories within the 1-year active intervention period. Distal outcomes—adolescent cigarette, alcohol, and illicit drug use and unsafe sexual behavior—were examined in terms of change trajectories from baseline to 2 years postintervention.

Hypothesis 1: Over time, adolescents randomized to Familias Unidas + PATH will be less likely to report (a) alcohol use, (b) cigarette use, and (c) illicit drug use during the 90 days prior to each assessment point compared with adolescents randomized to ESOL + PATH or ESOL + HEART.

Hypothesis 2: Over time, adolescents randomized to Familias Unidas + PATH will be less likely to engage in unprotected sex during the 90 days prior to each assessment point compared with adolescents randomized to either ESOL + PATH or ESOL + HEART.

Hypothesis 3: Parents randomized to Familias Unidas + PATH will report greater improvements in family functioning (comprising parental involvement, parent–adolescent communication, positive parenting, and family support) between baseline and postintervention than will parents randomized to either ESOL + PATH or ESOL + HEART.

Hypothesis 4: Improvements in family functioning during the intervention will mediate the effects of intervention condition on alcohol, cigarette, and illicit drug use and unprotected sex over time.

Method

The study was conducted from September 2000 through August 2005. It was approved by the University of Miami social and behavioral sciences institutional review board and by the research committee of the Miami–Dade County School Board.³

Participants

Adolescents and their families participated in the study in two cohorts: May 2001–July 2004 and May 2002–July 2005. Recruitment took place during April through June of the adolescents' seventh-grade year. During recruitment, on several occasions, study staff visited all seventh-grade homerooms in the three participating middle schools to distribute recruitment flyers to students. The flyer briefly described the study and the potential benefits associated with participation. Adolescents were asked to return the letter signed by their parents indicating whether the parents were interested in learning about the study. Parents who were interested in learning more about the study were contacted by project staff. Provided that parents were still interested after speaking with project staff, they and their adolescents were screened for eligibility. Students entering the eighth grade were selected for two reasons. First, the transition to ninth grade and high school is a time of increased risk (Schulenberg, Maggs, & Hurrelmann, 1997) for substance use and unsafe sexual behavior. Second, the base rates for these behaviors increase during high school (cf. Johnston et al., 2007), thus maximizing the likelihood of detecting intervention effects.

Families were eligible to participate provided that (a) at least one parent was born in a Spanish-speaking country in the Americas, (b) the adolescent was attending one of the three participating middle schools, (c) the adolescent would advance to the eighth grade in the next school year, (d) neither the adolescent nor the primary parent had ever been hospitalized for psychiatric reasons, (e) the family was not planning to move out of the Miami area during the 1st year of participation or out of the South Florida area during the 3 years of the study, (f) the adolescent was living with an adult primary caregiver who was willing to participate in the study, and (g) a primary caregiver was available on weekday evenings to attend weekly meetings. It should be noted that the mobility rate for these schools was approximately 40%, and approximately 26% of potential participants were ineligible to participate because they were planning to move out of the catchment area. One parent from each family participated in the study with the adolescent. Of the 649 potential families, 70 refused to participate. Of the remaining 579, 266 met inclusion criteria and were

randomized to one of the three interventions (see Figure 1). Families who satisfied eligibility criteria and who consented (i.e., parents) and assented (i.e., adolescents) completed the baseline assessments.

Participants in the present study were 128 boys and 138 girls (mean age = 13.4 years, *SD* = 0.68) and their primary caregivers (34 men, 232 women; mean age = 40.9 years, *SD* = 6.2). Only 18.6% of the families reported household income greater than \$30,000 per year. Forty percent of the adolescents were born in the United States. Immigrant adolescents (*n* = 159) and their parents were born in Cuba (40%), Nicaragua (25%), Honduras (9%), Colombia (4%), and other Hispanic countries (22%). Of foreign-born adolescents, exactly half had been living in the United States for less than 3 years, whereas the other half had been living in the United States either between 3 and 10 years (*n* = 54; 34%) or more than 10 years (*n* = 25; 16%). Parents of U.S.-born adolescents were born primarily in Nicaragua (33%), Cuba (20%), and Honduras (12%).

Study Design

The present study used a 3 (condition) × 5 (time) randomized controlled design. Participants were assessed at baseline, randomized, and reassessed at 6, 12 (postintervention), 24, and 36 months postbaseline. The study used an intent-to-treat design, such that participants continued to be assessed at each timepoint, whether or not they had dropped out of the intervention. The research coordinator randomized participants to one of three conditions using an urn randomization (Wei & Lachin, 1988) computer program that balanced on the following adolescent characteristics: gender; years in the United States (i.e., 0–3, 3–10, or more than 10); having initiated substance use (yes, no); and having initiated (yes, no) oral, vaginal, or anal sex.

Intervention

The active intervention phase constituted most of the 1st year of participation. Each condition consisted of two modules. The first condition consisted of Familias Unidas + PATH, the second condition consisted of ESOL + PATH, and the third condition consisted of ESOL + HEART. In each of the three conditions, families participated in the first module between September and December and in the second module between January and April. All intervention conditions were parent centered, with adolescents' participation in intervention activities limited to a small number of family visits and parent–adolescent discussion circles in the Familias Unidas and PATH modules. In these family visits, facilitators met separately with each parent and adolescent dyad and conducted exercises to help the parent enact with the adolescent the skills learned in the group sessions. Adolescents also participated in parent–adolescent discussion circles. In these parent–adolescent discussion circles, facilitators met jointly with all of the parent and adolescent dyads in multifamily group sessions.

All three conditions were designed to deliver an equivalent dosage of 49 hr, although the number and type of sessions varied.

³ Two serious adverse events were reported to the University of Miami's institutional review board. The board concluded that the adverse events "did not appear to be related to the study."

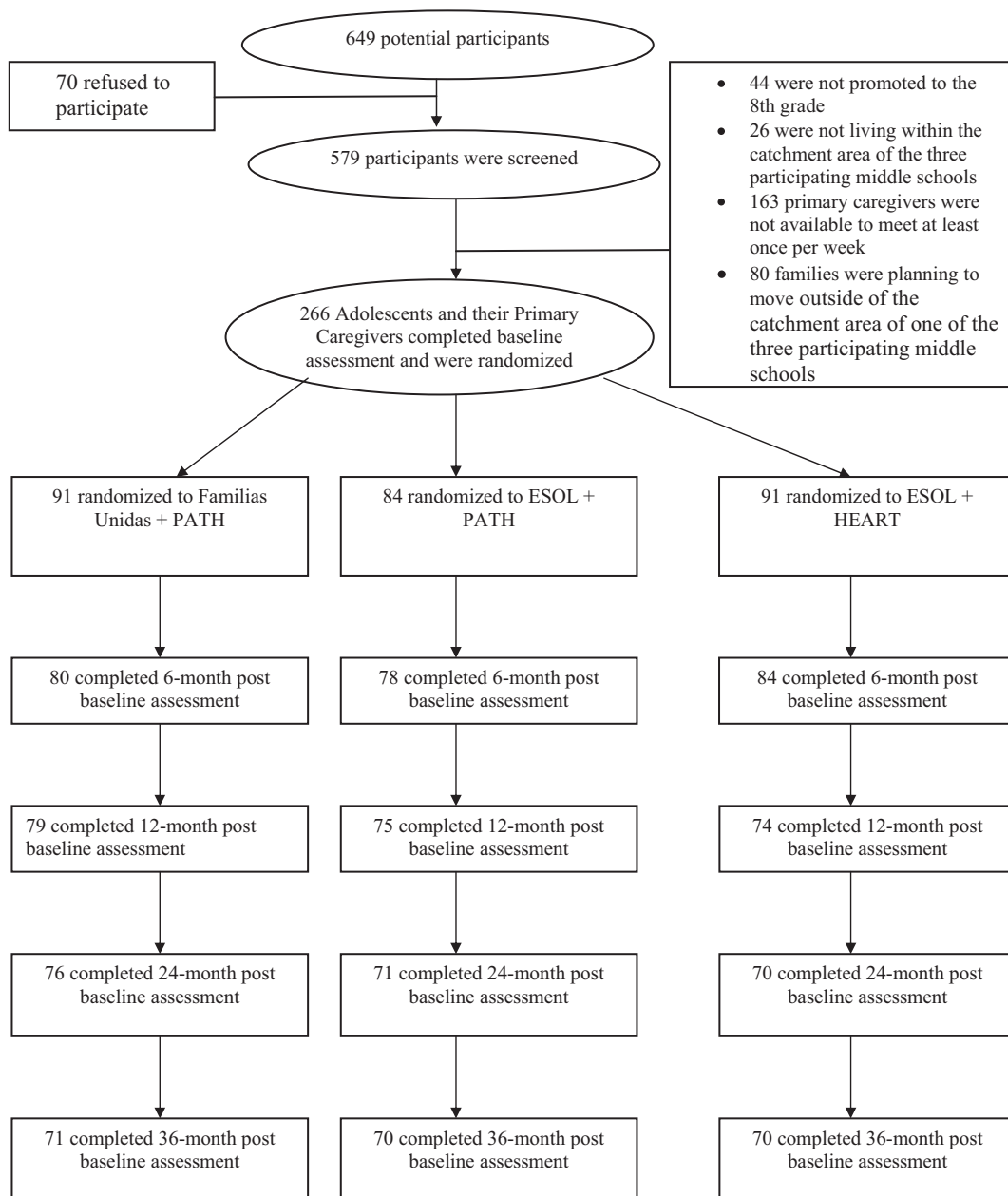


Figure 1. Flow of study participants. PATH = Parent–Preadolescent Training for HIV Prevention; ESOL = English for Speakers of Other Languages; HEART = HeartPower! for Hispanics.

In the Familias Unidas + PATH condition, there were 15 group sessions, 8 family visits, and 2 parent–adolescent circles. In the ESOL + PATH condition, there were 8 ESOL classes, 6 group sessions, and 2 family visits. In the ESOL + HEART condition, there were 8 ESOL classes and 7 group sessions. Each of the four modules that composed each of the three conditions is described below.

Familias Unidas. Familias Unidas is a Hispanic-specific, family-based preventive intervention designed to reduce risk for and increase protection against substance use and sexual risk behaviors in Hispanic adolescents. Hispanic-specific cultural is-

ssues are integrated in all aspects of the intervention, from the underlying theoretical model to the specific content of the intervention to the format of the intervention activities (Pantin et al., 2003, 2004). Familias Unidas is guided by ecodevelopmental theory (Szapocznik & Coatsworth, 1999). Ecodevelopmental theory borrows from and extends Bronfenbrenner’s (1986; Szapocznik & Coatsworth, 1999) social ecological framework. Consistent with ecodevelopmental theory, Familias Unidas aims to prevent substance use and sexual risk behaviors by (a) increasing parental involvement in the adolescent’s life, (b) increasing family support for the adolescent, (c) promoting positive parenting, and (d) in-

proving parent–adolescent communication (see Pantin et al., 2004, for more details on the intervention).

PATH. PATH (Krauss et al., 2000) is a theoretically based HIV prevention curriculum designed to promote responsible sexual behavior by training parents to become effective HIV educators for their children. PATH is designed to increase parents' and adolescents' knowledge about HIV and to promote parent–adolescent communication about HIV risks. PATH was originally designed for a multicultural sample that included Hispanics and was later adapted specifically for use with a Hispanic sample. One example of a cultural adaptation is the use of an induction video. This induction video used a Spanish *telenovela*, the equivalent of an American soap opera, to address the cultural taboos regarding discussing sexuality or HIV.

HEART. HEART is designed to reduce adolescents' risk for cardiovascular disease and to promote adolescent cardiovascular health by (a) increasing awareness of cardiovascular risk factors, such as cigarette use, and (b) improving attitudes toward exercise and nutrition. HEART encourages parents to be involved in their adolescents' cardiovascular health, but it is not specifically designed to reduce risk for adolescent illicit drug use or unsafe sexual behavior.

ESOL. The ESOL classes aimed to help parents communicate more effectively in English. It was expected that parents would be interested in this module because the majority of them were monolingual and had no working knowledge of English.

Combinations of modules for the interventions. The experimental intervention consisted of the Familias Unidas and PATH modules. The first control condition consisted of the ESOL and PATH modules. The inclusion of ESOL in the first control condition (ESOL + PATH) controlled for the dosage and participant contact in Familias Unidas. This condition was designed to evaluate whether parent–adolescent discussions about sexuality are best facilitated after promotion of general family communication and other positive family processes (e.g., positive parenting). In the second control condition, participants received both the ESOL and the HEART modules. HEART was chosen as a control for PATH because it does not target HIV risks directly and controls for the dosage and participant contact in PATH. As a result, the third control condition served as an attention control for both Familias Unidas and PATH. The Familias Unidas, PATH, and HEART modules were all delivered in Spanish. Because ESOL was designed to teach English skills, it was delivered in both languages.

Facilitators and Training of Facilitators

Three Hispanic facilitators (two master's and one doctoral level) conducted the intervention sessions in Familias Unidas, PATH, and HEART. Prior to conducting intervention activities, facilitators had an average of 5 years' clinical experience working with urban, low-income Hispanic immigrant families. Facilitators were trained and certified in Familias Unidas and PATH by the treatment developers, Dr. Hilda Pantin in Familias Unidas and Dr. Beatrice Krauss in PATH, for 3 months using the respective intervention manuals (Krauss et al., 2000; Pantin et al., 2004). Facilitators were trained in HEART using an intervention manual developed by the American Heart Association (1996). ESOL classes were conducted by certified ESOL instructors from the

local public school system to ensure that it was delivered by individuals with considerable expertise in language instruction. ESOL instructors did not receive any training or certification from the staff affiliated with the present study.

Familias Unidas, PATH, and HEART facilitators also received training in general group processes (e.g., promoting group cohesiveness). After completing their training, facilitators conducted pilot groups and pilot family visits with 54 families, 18 each for Familias Unidas, PATH, and HEART. These pilot families were recruited from the same schools and on the basis of the same inclusion and exclusion criteria as those recruited for the primary study. Facilitators needed to achieve a minimum of 80% adherence to be certified in the respective intervention module. The 54 pilot cases were not among the families randomized to condition or on whom outcome data are reported. Families participating in the pilot study were asked to provide feedback as to the cultural appropriateness of each of the intervention modules. Families characterized all intervention modules as culturally appropriate.

Adherence and Fidelity

All intervention sessions in the Familias Unidas, PATH, and HEART modules were videotaped with participants' consent. To assess adherence to the modules, independent raters, blind to condition, rated all of the videotaped group sessions and parent–adolescent discussion circles in each condition as well as 25% of the individualized family visits. Observational adherence measures were developed to identify key (prescribed) facilitator behaviors that were planned for each session in each of the intervention modules. For example, in one of the PATH group sessions, examples of prescribed facilitator behaviors included “guiding group in developing a plan for talking with children about HIV/AIDS,” “introducing and leading activities to demonstrate and practice safety skills,” and “reviewing and updating new information about HIV/AIDS.” Additionally, because the PATH intervention module was group-process oriented (as were Familias Unidas and HEART), key facilitator prescribed behaviors also included “joins all members of the groups” and “establishes group member alliances.” All facilitator prescribed behaviors were rated on an extensiveness/quality rating ranging from 0 = *not at all/very poor* to 6 = *extensively/excellent*. The average extensiveness/quality rating for all three intervention modules was *considerably/good*. The average adherence ratings were 3.72 ($SD = 0.48$) for Familias Unidas, 3.64 ($SD = 0.31$) for PATH, and 3.70 ($SD = 0.45$) for HEART. There were no significant differences in adherence ratings by intervention module, $F(2, 154) = 0.73, p = .49$. Interrater reliability for the adherence measures was satisfactory ($\kappa = .75$).

Procedures

Adolescent measures were completed on laptop computers with the audio computer-assisted self-interview system (Turner, Rogers, Lindberg, Pleck, & Sonenstein, 1998). The content of each questionnaire item, along with the response choices, was read to the adolescent through a set of headphones connected to a laptop computer. The adolescent indicated her or his response using the keyboard or mouse. Parent assessments were completed in interview form with a trained Hispanic interviewer. To minimize potential interviewer bias, interviewers were blind to condition. Dif-

ferent methods were used for adolescent versus parent assessments because, during the pilot phase, many parents expressed considerable discomfort about completing their assessments on computer. Families were compensated \$20, \$25, \$30, \$35, and \$40 for completing the baseline, 6-, 12-, 24-, and 36-month postbaseline assessments, respectively. Families were also eligible for transportation reimbursements (maximum \$30 per assessment) to complete the assessments in our offices. All payments were given to the parents.

Measures

The measures reported in this article were part of a larger assessment battery, which ranged from 60 to 90 min for adolescents and 45 to 60 min for parents. Parents and adolescents completed the battery in the language of their choice (Spanish or English). All measures were translated into Spanish by integrated back translation and committee resolution approaches, as recommended by Kurtines and Szapocznik (1995). Fifty-nine percent of adolescents completed their assessments in English, whereas all parents completed their assessments in Spanish.

Demographics. Adolescents and parents completed a demographics form on which they provided their date and country of birth, number of years lived in the United States, and national origin. Parents were also asked about their marital status and household income.

Acculturation. The Bicultural Involvement Questionnaire—Revised (Birman, 1998; Szapocznik & Kurtines, 1980) was used to assess adolescents' and parents' levels of orientation toward American and Hispanic culture. This measure assesses Americanism and Hispanicism in terms of both (a) comfort and enjoyment with American and Hispanic cultural practices (e.g., comfort and use of language, food, and traditions) and (b) how much participants would want or like to utilize American and Hispanic cultural practices. Twenty of the 21 Americanism and Hispanicism items (all except language use at work) were used for adolescents, and 20 of the 21 Americanism and Hispanicism items (all except language use at school) were used for parents. Each item on both the Americanism and the Hispanicism subscales was rated on a 5-point Likert scale, with higher scores on each of the two subscales representing more of an orientation to the respective culture. In the present sample, Cronbach's alpha coefficients for Americanism and Hispanicism scores were .92 and .90, respectively, for adolescents and .91 and .89, respectively, for parents.

Family functioning. Parent reports of family functioning were assessed with four indicators: parental involvement, positive parenting, family support, and parent-adolescent communication. Parental involvement (12 items; $\alpha = .78$) and positive parenting (6 items; $\alpha = .71$) were assessed via the corresponding subscales from the Parenting Practices Scale (Gorman-Smith, Tolan, Zelli, & Huesmann, 1996). Family support (6 items; $\alpha = .49$) was assessed via the corresponding subscale from the Family Relations Scale (Tolan, Gorman-Smith, Huesmann, & Zelli, 1997a).⁴ Parent-adolescent communication (20 items; $\alpha = .85$) was assessed with the Parent-Adolescent Communication Scale (Barnes & Olson, 1985). At each timepoint, we computed a Family Functioning factor score by taking the participant's standardized score on each of the family functioning indicators, multiplying this standardized

score by the corresponding factor loading for the indicator, and summing these four weighted indicators.

Substance use. Substance use was assessed with items similar to those used in the Monitoring the Future Study, a national epidemiologic study to assess the prevalence of substance use in the United States (Johnston et al., 2007). At each assessment, adolescents were asked whether they had ever smoked, drunk alcohol, or used an illicit drug in their lifetime and in the 90 days prior to assessment.⁵ Adolescents who responded "yes" to having used an illicit drug in the past 90 days were asked about the frequency of their use of a variety of drugs, including marijuana, cocaine, amphetamines, methamphetamines, and barbiturates.

Sexual risk behaviors. Sexual risk behaviors were measured with items from Jemmott et al.'s (1998) Sexual Behavior instrument. At each assessment timepoint, adolescents were asked to indicate whether they had ever had sex in their lifetime and in the 90 days prior to assessment. Adolescents who reported having had sex in the past 90 days were asked whether they had engaged in unprotected sex (i.e., sex without a condom) during that time. Adolescents who reported ever having sex were also asked whether they had engaged in unprotected sex at last intercourse, had consumed alcohol or drugs before their last sexual intercourse, and had ever contracted a sexually transmitted disease.

Results

Sample Size Calculations

When we estimated 20% attrition over the 36-month follow-up period and set the Type I error rate at .05 (for a two-tailed test), with 80% power, 240 participants were required across the three study conditions to detect an Intervention \times Time effect size equivalent to $d = 0.28$ (Cohen, 1988).

Data Analytic Strategy

Mplus Version 3.12 (Muthén & Muthén, 2005) was used to test the study hypotheses.

Hypotheses 1, 2, and 3. Tests of Hypotheses 1, 2, and 3 were conducted via growth curve modeling. Growth curve analyses were used to estimate individual trajectories of change and to test for slope differences among the three study conditions over time. Growth curve modeling is more powerful and versatile than repeated measures analysis of variance because it allows for missing data, with the assumption that the data are missing at random (Little & Rubin, 1987). In these analyses, Familias Unidas + PATH served as the reference group, so that each control condition (i.e., ESOL + PATH and ESOL + HEART) was compared with Familias Unidas + PATH. Therefore, the coefficients obtained for the ESOL + HEART and ESOL + PATH conditions indicate the direction and degree to which each condition differs from the Familias Unidas + PATH condition on the outcome in question. For each of the four distal outcomes, data from all five assessment

⁴ This low alpha is consistent with the alpha reported in the validation study of this measure (Tolan, Gorman-Smith, Huesmann, & Zelli, 1997b).

⁵ Past-90-day outcomes are commonly reported in randomized controlled trials involving HIV preventive interventions (e.g., DiClemente et al., 2004; Jemmott, Jemmott, & Fong, 1998).

Table 1
Baseline Comparisons of Demographic Characteristics and Outcome Variables by Intervention Condition

Variable	Familias Unidas + PATH (<i>n</i> = 91)		ESOL + PATH (<i>n</i> = 84)		ESOL + HEART (<i>n</i> = 91)		<i>p</i>
	<i>n</i> (%)	<i>M</i> (<i>SD</i>)	<i>n</i> (%)	<i>M</i> (<i>SD</i>)	<i>n</i> (%)	<i>M</i> (<i>SD</i>)	
Gender							
Male	39 (43)		42 (50)		47 (52)		.45
Female	52 (57)		42 (50)		44 (48)		
Age		13.36 (0.67)		13.40 (0.72)		13.49 (0.66)	.41
Years in the United States							.46
0–3	31 (34)		25 (30)		27 (30)		
3–10	18 (20)		24 (29)		17 (19)		
>10	42 (46)		35 (41)		47 (52)		
Family income							.67
\$0–\$9,999	20 (22)		21 (25)		27 (30)		
\$10,000–\$19,999	34 (37)		23 (27)		30 (33)		
\$20,000–\$29,999	20 (22)		22 (26)		18 (20)		
>\$30,000	14 (15)		18 (21)		16 (18)		
Not reported	3(3)						
Adolescent's Americanism		73.31 (14.13)		73.99 (14.31)		75.12 (13.57)	.68
Adolescent's Hispanicism		67.30 (12.95)		65.73 (13.15)		64.62 (14.64)	.42
Parent's Americanism		48.56 (13.41)		49.78 (12.42)		51.35 (15.83)	.41
Parent's Hispanicism		81.16 (11.40)		79.19 (11.44)		78.89 (12.67)	.38
Family Functioning factor score		–1.0 (1.0)		0.04 (1.0)		0.06 (0.9)	.57
Parent-adolescent communication		77.3 (8.4)		78.0 (8.9)		77.0 (9.4)	.75
Family support		18.5 (3.3)		19.0 (2.3)		18.8 (3.0)	.55
Parental involvement		34.3 (4.2)		34.7 (3.7)		34.9 (3.1)	.65
Positive parenting		16.5 (1.6)		16.7 (1.8)		16.9 (1.8)	.46
Past-90-day cigarette use (binary)	3 (3.3)		1 (1.2)		3 (3.3)		.71
Past-90-day alcohol use (binary)	9 (10.0)		9 (10.7)		8 (8.8)		.91
Past-90-day illicit drug use (binary)	2 (2.2)		6 (7.1)		3 (3.3)		.29
Frequency of past-90-day illicit drug use		0.43 (3.69)		0.16 (0.81)		0.07 (0.54)	.52
Past-90-day unprotected sex (binary)	0 (0)		N/A ^a		1 (50)		1.00

Note. PATH = Parent-Preadolescent Training for HIV Prevention; ESOL = English for Speakers of Other Languages; HEART = HeartPower! for Hispanics.

^a There were no participants in this condition who reported engaging in past-90-day sexual behavior at baseline, and hence this item does not apply.

points (baseline and 6, 12, 24, and 36 months postbaseline) were used. Because the substance use outcomes were binary, the categorical option in Mplus, which uses a logit link to analyze binary data, was used. For family functioning, which was a proximal outcome and was expected to change primarily during the active intervention period, analyses focused on changes between baseline and 12 months postbaseline.

Hypothesis 4. Mediation analyses were planned to examine whether significant changes in family functioning (if any) might have mediated the effect of the intervention on any of the four distal outcomes: past-90-day alcohol use, past-90-day cigarette use, past-90-day illicit drug use, and past-90-day unprotected sex. For each outcome for which the effect of condition was statistically significant, a growth curve controlling for the slope of family functioning was then estimated (Cheong, MacKinnon, & Khoo, 2003). For each outcome, mediation was assumed if the path from intervention condition to the slope of the outcome variable was reduced to nonsignificance when the slope of family functioning was added to the model.

Comparability of Conditions

Chi-square tests and analyses of variance indicated no significant differences by intervention on any of the demographic char-

acteristics; acculturation (Americanism and Hispanicism); family functioning; or alcohol use, cigarette use, illicit drug use, or unprotected sex in the 90 days prior to the baseline assessment (see Table 1).

Tests of Hypotheses

Hypothesis 1a: Alcohol use. Growth curve analyses showed no significant differences in past-90-day alcohol use between Familias Unidas + PATH and either of the other conditions.⁶

Hypothesis 1b: Cigarette use. Growth curve analyses indicated significant differences in past-90-day cigarette use between Familias Unidas + PATH and ESOL + PATH ($z = 3.25, p < .002; d = 0.54$) as well as between Familias Unidas + PATH and ESOL + HEART ($z = 2.66, p < .008; d = 0.80$). The mean trajectory of smoking in Familias Unidas + PATH decreased, while the mean trajectories of smoking increased in both ESOL + PATH and ESOL + HEART. The observed percentages (see Figure 2) indicate that at the 36-month postbaseline assessment,

⁶ Growth curve analyses controlling for dosage were estimated and were virtually identical. The results for all analyses are available from Guillermo Prado.

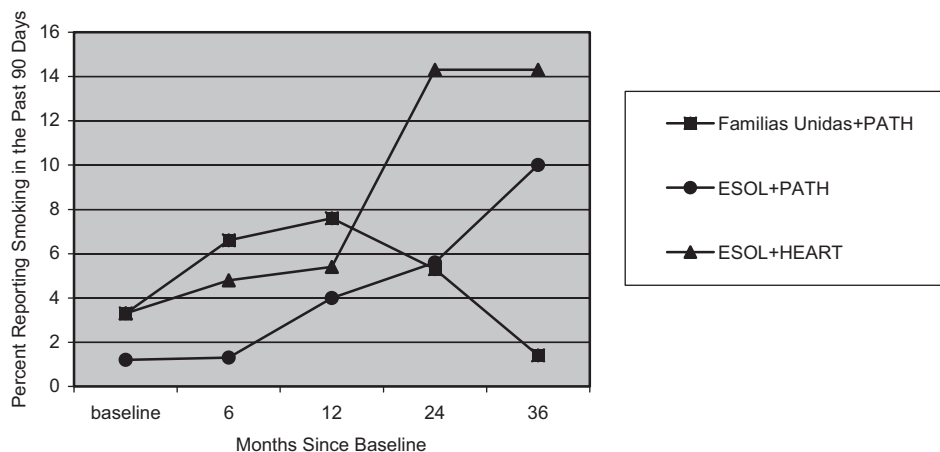


Figure 2. Past-90-days smoking by condition. PATH = Parent-Preadolescent Training for HIV Prevention; ESOL = English for Speakers of Other Languages; HEART = HeartPower! for Hispanics.

1.4% of the adolescents in Familias Unidas + PATH reported smoking in the 90 days prior to assessment, compared to 10% in ESOL + PATH and 14.3% in ESOL + HEART.

Hypothesis 1c: Illicit drug use. Growth curve analyses indicated significant differences in past-90-day illicit drug use between Familias Unidas + PATH and ESOL + HEART ($z = 2.02, p < .05; d = 0.58$). No significant differences were observed between Familias Unidas + PATH and ESOL + PATH ($z = 1.07, p = .28; d = 0.05$). The observed mean frequency of illicit drug use decreased in Familias Unidas + PATH but increased in ESOL + HEART between 24 and 36 months postbaseline (see Figure 3).

Hypothesis 2: Unprotected sexual behavior. Growth curve analyses were not estimated for past-90-day unprotected sex given the small number of participants engaging in sexual behavior in the past 90 days. However, Fisher's exact tests conducted at each timepoint indicated that there were no significant differences by condition for this outcome.

Hypothesis 3: Family functioning. Growth curve analyses indicated significant differences in family functioning between Familias Unidas + PATH and ESOL + PATH ($z = -2.47, p < .02; d = 0.28$) and between Familias Unidas + PATH and ESOL + HEART ($z = -3.52, p < .0005; d = 0.38$). The mean trajectory of family functioning in Familias Unidas + PATH increased, while the mean trajectories of family functioning decreased in both ESOL + PATH and ESOL + HEART (see Figure 4 for observed means).⁷

Hypothesis 4. Mediation analyses were conducted to determine whether family functioning mediated the effects of intervention on past-90-day smoking and illicit drug use. Mediation analyses were not conducted on past-90-day alcohol use or past-90-day unprotected sexual intercourse, because there were no significant intervention effects on these outcomes.

When the slope of family functioning on the growth curve of smoking was controlled, the results indicated that neither the growth trajectories between Familias Unidas + PATH and ESOL + PATH ($z = 1.32, ns$) nor those between Familias Unidas + PATH and ESOL + HEART ($z = 1.11, ns$) differed significantly. Thus, changes in family functioning partially mediated the effect of intervention condition on smoking. Similarly,

when the slope of family functioning was controlled, results indicated that differences in the growth trajectories for illicit drug use between Familias Unidas + PATH and ESOL + HEART ($z = 1.28, p = .20$) were no longer significantly different. Thus, changes in family functioning partially mediated the effect of intervention on illicit drug use.

Post Hoc Analyses

Decomposition of family functioning. The significant omnibus effect of intervention condition on family functioning was then followed up with post hoc exploratory analyses. Because these exploratory post hoc analyses were applied only after the overall omnibus test was significant, Bonferroni corrections were not applied (Hedeker & Gibbons, 2006). In these analyses, we decomposed the Family Functioning factor score into its four component indicators (parent involvement, family support, positive parenting, and parent-adolescent communication) to explore the specific aspects of family functioning on which Familias Unidas + PATH differed significantly from the other conditions. Growth curve analyses indicated significant differences in positive parenting between Familias Unidas + PATH and ESOL + HEART ($z = -1.97, p < .05; d = 0.12$) and between Familias Unidas + PATH and ESOL + PATH ($z = -2.03, p < .05; d = 0.21$). The mean trajectory of positive parenting in Familias Unidas + PATH increased, while the mean trajectories of positive parenting decreased in both ESOL + PATH and ESOL + HEART. Significant differences also emerged for parent-adolescent communication. The mean trajectory of parent-adolescent communication in Familias Unidas + PATH increased, while the mean trajectory of parent-adolescent communication decreased in ESOL + PATH ($z = -2.43, p < .02; d = 0.26$). No significant difference was observed in the growth trajectories for parent-adolescent commu-

⁷ Because of the low reliability in family support, analyses were conducted both with and without the Family Support subscale, and the results were virtually identical. However, because of the theoretical importance of family support within ecodevelopmental theory and within Familias Unidas, the subscale was retained in analysis.

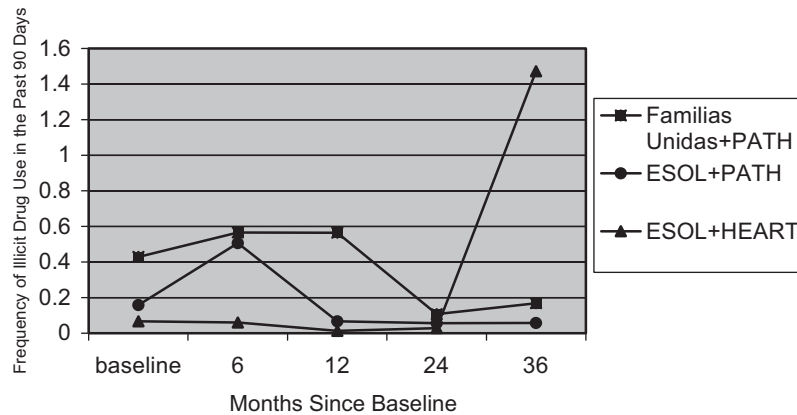


Figure 3. Past-90-days illicit drug use by condition. PATH = Parent-Preadolescent Training for HIV Prevention; ESOL = English for Speakers of Other Languages; HEART = HeartPower! for Hispanics.

nication between Familias Unidas + PATH and ESOL + HEART. Additionally, no significant differences by condition emerged for parental involvement or family support.

Mediation analysis: Positive parenting and parent-adolescent communication. We conducted post hoc analyses to determine whether positive parenting and parent-adolescent communication mediated the effects of intervention on past-90-day smoking and illicit drug use. When we controlled for the slope of positive parenting on the growth curve of smoking, differences in the growth trajectories between Familias Unidas + PATH and ESOL + PATH ($z = 1.45, p = .15$) and between Familias Unidas + PATH and ESOL + HEART ($z = 1.10, p = .27$) were reduced to nonsignificance. Similarly, when we controlled for the slope of parent-adolescent communication, the differences in the growth trajectories for smoking between Familias Unidas + PATH and ESOL + PATH ($z = 1.27, p = .20$) were reduced to nonsignificance. This suggests that changes in positive parenting and changes in parent-adolescent communication each partially mediated the intervention effect on smoking.

When we controlled for the slope of positive parenting, differences in the growth trajectories for illicit drug use between Familias Unidas + PATH and ESOL + HEART ($z = 1.34, p = .18$) were reduced to nonsignificance. Analyses to determine whether parent-adolescent communication mediated the intervention effects on illicit drug use were not conducted because there were no significant differences between Familias Unidas + PATH and ESOL + HEART on parent-adolescent communication and no significant differences between Familias Unidas + PATH and ESOL + PATH on illicit drug use (as reported in the test of Hypothesis 1c).

Substance use initiation. We conducted post hoc analyses to explore whether rates of substance use initiation (i.e., smoking, alcohol, and drug use) significantly differed by condition.⁸ The results indicated that smoking initiation rates were significantly different by condition, $\chi^2(2, N = 218) = 6.79, p < .04 (w = .18)$. Fewer adolescents in Familias Unidas + PATH (8 out of 74; 10.8%) reported initiating smoking during the course of the study (i.e., from 6 months to 3 years postbaseline), compared to adolescents in ESOL + PATH (18 out of 74; 24.3%) and ESOL + HEART (19 out of 70; 27.1%). No significant differences in initiation rates were observed for alcohol use or illicit drug use.

Sexual risk behaviors. We conducted post hoc analyses to explore differences by intervention condition on incidence of STDs and two additional HIV risk behaviors measured by the Youth Risk Behavior Surveillance Survey: (a) unprotected sex at last sexual intercourse and (b) alcohol or drug use before last sexual intercourse.⁹ The incidence of STDs in Familias Unidas + PATH (0 out of 80; 0%) was significantly lower than that for adolescents in ESOL + PATH (1 out of 81; 1.2%) and ESOL + HEART (5 out of 85; 5.9%), Fisher's exact $p = .05$. Readers should use caution when interpreting this finding, given the small number of participants reporting STD contraction. A significant difference also emerged, $\chi^2(1, N = 53) = 3.87, p < .05 (w = .27)$, in unsafe sex at last sexual intercourse between Familias Unidas + PATH and ESOL + PATH, with 19.2% (or 5 out of 26) of the adolescents in Familias Unidas + PATH and 44.4% (or 12 out of 27) in ESOL + PATH reporting unsafe sexual intercourse. No other significant differences were found.

Discussion

The purpose of the present study was to evaluate the efficacy of Familias Unidas + PATH, a parent-centered, ecodevelopmentally based intervention, in preventing substance use and unsafe sexual behavior in Hispanic adolescents. To our knowledge, the present study is the first to examine the efficacy of a culturally specific intervention in preventing both substance use and sexual risk behaviors in this rapidly growing and at-risk population.

Familias Unidas + PATH was efficacious in preventing smoking initiation and in reducing cigarette and illicit drug use, moderately efficacious in preventing unsafe sexual behavior, and not efficacious in preventing or reducing alcohol use. The effects of Familias Unidas + PATH on cigarette and illicit drug use were partially mediated by improvements in family functioning.

⁸ For each of the respective analyses, adolescents were excluded if they indicated the behavior at baseline. For example, adolescents who reported having smoked at baseline were excluded from the smoking initiation analyses.

⁹ There were no participants in this condition who reported engaging in past-90-day sexual behavior at baseline, and hence this item does not apply.

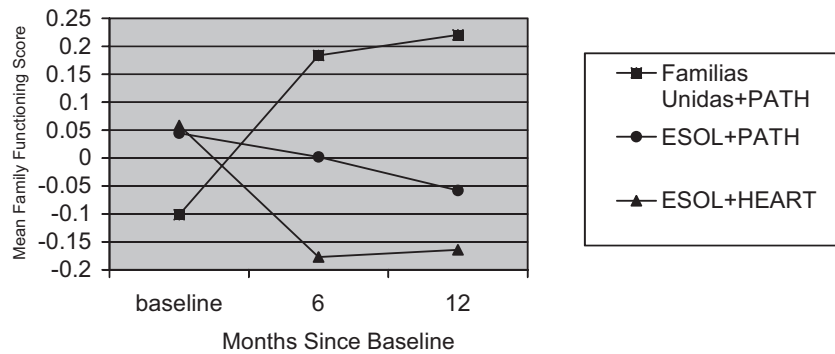


Figure 4. Family functioning factor score by condition. PATH = Parent–Preadolescent Training for HIV Prevention; ESOL = English for Speakers of Other Languages; HEART = HeartPower! for Hispanics.

These findings affirm the importance of family functioning in the prevention of substance use. There is evidence that family processes are irrevocably intertwined with the development of substance use (e.g., Sale et al., 2005) and that family-based interventions are among the most efficacious modalities in preventing adolescent substance use (Tobler et al., 2000). The present results also suggest important differences among family processes in protecting Hispanic adolescents from specific negative health outcomes. It is noteworthy that only two of the four family processes assessed—positive parenting and parent–adolescent communication—were associated with significant differences favoring Familias Unidas + PATH. Parental involvement and family support, for which differential efficacy was not found, increased in all three conditions. All three conditions encouraged parents to be involved in their adolescents' lives and to offer them support. However, only the Familias Unidas module focused specifically on improving positive parenting and parent–adolescent communication. This suggests that the favorable outcomes evident in Familias Unidas + PATH, relative to the other two conditions, may be attributable to Familias Unidas and not PATH. Nevertheless, future research is needed to support definitive conclusions regarding the efficacy of Familias Unidas without PATH.

Examining the trajectories of cigarette and illicit drug use across conditions suggests that the preventive effects of Familias Unidas + PATH emerged most strongly at the 2-year follow-up. This finding is consistent with other studies (e.g., Wolchik et al., 2002) that have found delayed effects of preventive interventions delivered in early adolescence. The present finding, along with the results reported by Wolchik et al., suggest that effects of preventive interventions may only become apparent after several years postintervention. Such sleeper effects may be a function of developmental increases in base rates of the target behaviors.

Although Familias Unidas + PATH was efficacious relative to the control conditions in preventing cigarette smoking and illicit drug use, it was not efficacious in preventing alcohol use. With regard to alcohol use, the results from this study are consistent with those of Martinez and Eddy (2005), whose Hispanic-specific prevention program was efficacious in decreasing the likelihood of tobacco, but not alcohol, use in a sample of primarily Mexican American adolescents. Further research is needed to understand these results.

Regarding prevention of unsafe sexual behavior, sexually active adolescents in Familias Unidas + PATH reported having been

significantly more likely to use a condom at last sexual intercourse than their counterparts in ESOL + PATH. Moreover, adolescents in Familias Unidas + PATH were significantly less likely to report having contracted sexually transmitted diseases than were adolescents in the other conditions. Although the PATH module specifically targeted HIV risks, including unprotected sexual behavior, the present finding suggests that, for Hispanic adolescents, discussions about HIV risks may be most beneficial when delivered following an intervention that improves family functioning. If general parent–adolescent communication and other aspects of positive family functioning are not first targeted, facilitating parent–adolescent discussions about sexuality and HIV may produce iatrogenic results. However, the condition differences in condom use at last sexual intercourse must be interpreted with caution, given that no effects were found for past-90-day unprotected sexual intercourse. It is important to note, however, that this lack of statistical significance might have been due, at least in part, to the small number of participants reporting past-90-day unprotected sexual intercourse.

Another important observation from this study is that the Familias Unidas + PATH intervention produced favorable outcomes in the adolescents, even though the majority of the intervention sessions were delivered only to the parents. This finding is consistent with other studies that have found that adolescent behaviors can be altered even when the majority of intervention sessions are delivered to parents (e.g., Martinez & Eddy, 2005; Pantin et al., 2003) and place parents in the change agent role. Moreover, the consistency of these findings with those using non-Hispanic samples (e.g., Brody et al., 2006; Spoth, Gyll, Chao, & Molgaard, 2003) suggests that the efficacy of parent-based interventions in preventing adolescent substance use and unsafe sexual behavior may generalize across ethnic groups.

Finally, it was surprising that the ESOL + HEART condition, in which the HEART module was specifically designed to prevent cardiovascular risk behaviors, such as cigarette smoking, was less efficacious in preventing smoking than Familias Unidas + PATH, in which smoking was not directly addressed. Of similar interest is the fact that ESOL + PATH, in which the PATH module was specifically designed to target HIV risks, was not efficacious in preventing unsafe sexual intercourse. However, Familias Unidas + PATH was efficacious in preventing both cigarette smoking and unsafe sexual behavior at last intercourse. These findings suggest that targeting specific health behaviors in the context of

strengthening the family system may be most efficacious in preventing or reducing cigarette smoking and unsafe sex in Hispanic adolescents.

Limitations

The present results should be considered in light of several important limitations. First, the study would have benefited from the inclusion of an inert control condition. Although attention control modules were used to control for the effects of dosage and nonspecific parent group processes, such as social support, these attention control modules might have inadvertently affected some of the study variables and might have reduced the power to detect the efficacy of Familias Unidas + PATH. At least one module in each condition encouraged parents to spend time with their adolescents and to teach them specific strategies or behaviors. For example, in HEART, parents were prompted to be involved in their adolescents' physical fitness and health decisions. In PATH, parents were prompted to educate their adolescents about safe versus unsafe sexual behavior. Perhaps as a result, improvements in parental involvement and in family support were observed across all conditions.

Another limitation is that the present sample was not representative of the U.S. Hispanic population, and hence the results should not be generalized to all Hispanic adolescents. The U.S. Hispanic population is composed mostly of Mexican Americans, who represent 65% of all legal U.S. Hispanic residents (Marotta & Garcia, 2003) and a large majority of unauthorized migrants (Bean, Corona, Tuiran, Woodrow-Lafield, & Van Hook, 2001). This subpopulation of Hispanics was not well represented in our study. It is important, then, to replicate the present results with a representative sample of Hispanic adolescents and their families.

Third, as in all prevention studies, participants were those who consented and assented to participate in the study. Self-selection biases may be associated with such samples, in that participants who enroll in the intervention may have better functioning families than those who do not enroll (Perrino, Coatsworth, Briones, Pantin, & Szapocznik, 2001). Because informed consent was obtained only from families who were screened and determined to be eligible for the study, it was not possible to compare the randomized sample to the screened sample or to the population of students in the participating schools. Without information about those who refused to participate and those who were excluded, it is unclear how much this sample represents even the local population from which participants were recruited.

A fourth limitation is the reliance on self-report measures. Self-report measures are vulnerable to social desirability effects. Direct observations of parent-adolescent interactions and standardized observational ratings of these interactions across all participating families may help to provide a better representation of the targeted constructs. Self-report measures may also present problems with regard to drug and alcohol use and to sexually transmitted diseases. Although self-reports tend to converge reasonably well with biomarkers of drug use in minority adolescents (Dillon, Turner, Robbins, & Szapocznik, 2005), there is evidence that some adolescents provide false-negative reports of drug use (Santisteban et al., 2003). However, prior research (e.g., Metzger et al., 2000) has found that audio computer-assisted self-interview, the method of administration used in this study, increases the

veracity of responding. Finally, some adolescents may not be aware that they have a sexually transmitted disease, and those who are aware may not be willing to disclose this information.

Fifth, continuous data were not collected for smoking and alcohol use at each timepoint. Although fairly strong effects for cigarette smoking were found favoring Familias Unidas + PATH, the collection of dichotomous data on alcohol use substantially limited the possibility of uncovering intervention effects on this outcome. It is recommended that future studies include more sensitive measures of alcohol use, consistent with those now conventional in the adolescent alcohol treatment literature.

Sixth, adolescents were involved, however minimally, in Familias Unidas, PATH, and HEART but not involved at all in the ESOL module. Because ESOL was included in both control conditions, differential levels of adolescent exposure cannot be ruled out as having contributed to the findings. However, an alternative explanation, consistent with ecodevelopmental theory, suggests that family functioning is the mechanism that produces changes in adolescent outcomes. The present results support this interpretation, given that changes in family functioning mediated the effects of intervention condition on adolescent substance use outcomes. It is possible that the youths' presence in intervention sessions facilitated improvements in family functioning because the parents were able to rehearse their newly acquired parenting skills in vivo (i.e., with the adolescent).

Conclusions and Future Directions

Despite these limitations, the present study may have important practical implications for clinical practice as well as for research. For practice, it is clear that working primarily with parents may be an especially effective strategy for preventing or reducing negative behaviors among Hispanic adolescents and perhaps among adolescents in general. Improving family functioning—especially parent-adolescent communication and positive parenting—is critical in preventing substance use and unsafe sex in Hispanic adolescents. Educating parents and adolescents about risks associated with substance use and with unsafe sex appears to be less effective, especially without attention to family functioning beforehand.

For research, the present results suggest that Familias Unidas + PATH is efficacious in preventing cigarette and illicit drug use and unsafe sex and that the intervention operates, in part, through improvements in family functioning. There are at least two future directions that follow from this study. First, given the sharp rise in rates of substance use in emerging adulthood (Arnett, 2004), it is important to track the efficacy of Familias Unidas + PATH and similar interventions in preventing substance use into emerging adulthood. Second, it is important to examine the efficacy of Familias Unidas + PATH across different subgroups of Hispanic adolescents. As discussed by Pantin, Prado, Schwartz, and Sullivan (2005) and Prado et al. (2006), Hispanic adolescents differ not only by nationality and immigrant generation but also by risk and protective processes, such as positive parenting and parent-adolescent communication. It is therefore important to identify and examine subgroups of adolescents for whom Familias Unidas + PATH is more or less efficacious. This work is currently underway (Grant DA019101; Guillermo Prado, principal investigator).

In conclusion, the present results suggest that Familias Unidas + PATH may have the potential to help reduce the disparities

in substance use and HIV rates between Hispanic adolescents and those from other ethnic groups by preventing and reducing substance use and sexual risk behaviors in Hispanic adolescents. These results suggest that a culturally specific, parent-centered intervention may be efficacious in preventing or reducing health risk behaviors in this rapidly growing and vulnerable population.

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