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# Sexual Behaviors and Substance Use Among Puerto Rican Adolescents at High and Low Risk for Substance Use Disorders

Wendy Lee Brunetto

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SEXUAL BEHAVIORS AND SUBSTANCE USE AMONG PUERTO RICAN  
ADOLESCENTS AT HIGH AND LOW RISK FOR SUBSTANCE USE DISORDERS

Wendy Lee Brunetto

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SEXUAL BEHAVIORS AND SUBSTANCE USE AMONG PUERTO RICAN  
ADOLESCENTS AT HIGH AND LOW RISK FOR SUBSTANCE USE DISORDERS

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## **Introduction**

The purpose of the present study is to determine whether or not substance use and risky sexual behaviors, known risk factors for HIV/AIDS, co-occur in a cohort of Puerto Rican adolescents at high- and low-risk for substance use problems by virtue of a parental substance use disorder. To begin with, this paper will review the current literature on HIV/AIDS among Hispanic populations. Secondly, prevalence rates of substance use disorders among Caucasian and Hispanic adults in the general population will be provided. Next, rates of substance use and sexual behaviors among Caucasian and Hispanic adolescents will be presented. This information will be supported by a review of the literature pertaining to the co-varying relationship between substance use and sexual behaviors among these adolescent populations. Finally, literature pertaining to the familial transmission of substance use disorders in adults and children will be provided followed by information regarding additional sociocultural risk factors unique to Hispanic populations.

### ***HIV and AIDS Among Hispanics***

In 1999, Hispanics represented 13% of the total United States' population but accounted for 19% of the new HIV/AIDS cases, and the incidence rate of HIV/AIDS among Hispanics was 25.6% compared to 7.6% for Caucasians and 66.0% for African-Americans. In addition, between 1992 and 1998 the incidence of HIV/AIDS among Caucasians has decreased by 10%, but has increased by 2% among Hispanics (CDC, 1999). Klevens et al (1999) reviewed the most recent trends in the HIV/AIDS epidemic among Hispanics by calculating the incidence rates for people diagnosed with HIV/AIDS



between 1991 through 1996. A total of 415,864 HIV/AIDS cases were diagnosed between 1991 and 1996 and reported to the Center's for Disease Control (CDC) by September 30, 1998. Among these, 78,138 (19%) were Hispanic, of whom 80% were adult men and 19% were adult women. Among Hispanic adults, 27,813 (36%) were born in the United States, 24,087 (31%) in Puerto Rico, 3,326 (4%) in Cuba, 6,207 (8%) in Mexico, 5,121 (7%) in Central or South America, 2,291 (3%) in other countries, and 8,303 (11%) did not specify their origin of birth or the data were missing. Overall, the study findings illustrate that among Hispanics with HIV/AIDS, 67% were either born in the United States or Puerto Rico (Klevens, Diaz, Fleming, Mays, & Frey, 1999).

Several studies have confirmed that among Hispanics living in the United States, Puerto Ricans have the highest incidence of HIV/AIDS (Hopkins, 1987; Montoya, Bell, Richard, Carlson, & Trevino, 1999; Robles, Colon, Matos, Marrero, & Lopez, 1990). Robles et al (1990) analyzed data resulting from the Puerto Rico AIDS Prevention (PRAP) Project which recruited 385 intravenous drug users from the San Juan metropolitan area and compared their findings to other comparable studies performed in the United States. The chief goal of the study was to identify types of risk behaviors prevalent among these groups of people in order to design intervention programs targeted at reducing the risk behaviors in order to control the spread of HIV/AIDS. The study findings indicated that 84.9% of the island Puerto Ricans engaged in daily injection compared to 79.6% of the mainland Puerto Ricans, 61.9% of other Hispanics, 49.8% of African-Americans, and 48.8% of Caucasians. In addition, 64.3% of the island Puerto Ricans reported using their intravenous drugs at shooting galleries compared to 27.9% of the mainland Puerto Ricans, 16.9% of other Hispanics, 17.6% of African-Americans, and

10.4% of Caucasians (Robles et al., 1990). Similar findings were reported by Montoya et al (1999) who conducted a study of Mexican, Mexican-American, and Puerto Rican chronic drug users (N=3,660) in order to compare the HIV/AIDS risks among these Hispanic subpopulations. Approximately, 82% of the entire sample reported having injected drugs, and 79% reported doing so during the last 30 days. The majority of the sample (67%) reported having been previously tested for HIV/AIDS. Overall, among the three subgroups of Hispanics, Puerto Ricans had significantly greater estimated overall HIV/AIDS risk, injection risk, and sexual risk (e.g., condom non-use) compared to the Mexican-Americans and Mexicans in this study (Montoya et al., 1999).

Because high-risk sexual behaviors and drug use, two of the most common risk factors for HIV/AIDS, are typically initiated during adolescence, the epidemic continues to be propagated in young people. In fact, adolescents and young adults represent one of the fastest growing categories of HIV/AIDS cases in the United States (CDC, 1999; Rosenberg & Biggar, 1998). For example, a report issued by the CDC (1999) indicated that as of December 1999, 15% of the reported HIV cases were among people between the ages of 13 and 24, with women accounting for 49% of these cases. Additionally, because the incubation period between the time of HIV infection and the development of AIDS is approximately 10 years, infected adults between the ages of 25 and 30 probably contracted the virus during adolescence (CDC, 1999). Therefore, prevention and intervention strategies must focus on reducing these high-risk behaviors during adolescence, a time of heightened risk for HIV infection.

### ***Substance Use Disorders Among Adults***

Population-based estimates of substance use disorders among adults have been provided by several national surveys. Using the Diagnostic Interview Schedule (DIS) based on DSM-III-R criteria, the Epidemiologic Catchment Area (ECA) Study surveyed both household and non-household residents ages 18 and older between the years 1980 and 1984. Results indicated that the lifetime prevalence of substance abuse/dependence in the general population was 13.8% for alcohol, 6.2% for any drug, 4.4% for marijuana, and 0.7% for opiates. At that time, the prevalence rates for any lifetime drug abuse/dependence were much higher among Caucasians (14.4%) than Hispanics (7.4%) between the ages of 18 and 29, and this pattern held true among 30 to 44 year olds with the higher rates still being displayed by Caucasians (7.0%) compared to Hispanics (3.9%). However, the lifetime prevalence rates of alcohol abuse/dependence were higher among Hispanics (16.7%) than Caucasians (13.6%) across all age groups (Anthony & Helzer, 1991; Helzer, Burnam, & McEvoy, 1991).

Nearly a decade later, the National Comorbidity Survey (NCS) polled household residents between the ages of 15 and 54 in the United States from 1990 to 1992. Using the Composite International Diagnostic Interview (CIDI) based on DSM-III-R, lifetime prevalence rates of several psychiatric disorders, including alcohol and substance, were calculated. The lifetime and current (past 12 months) rates for alcohol dependence in the general population were 14.1% and 7.2%, and the lifetime and current rates for drug dependence were 7.5% and 2.8%. In contrast to the findings of the ECA study, although specific rates were not provided, no differences in lifetime or current disorders emerged between Caucasians and Hispanics (Kessler et al., 1994). More recently, results from the

1999 National Household Survey on Drug Abuse (NHSDA), which surveys representative households in the United States on individuals age 12 and older, reported that the rates for illicit drug dependence were slightly higher among Hispanics (1.9%) than Caucasians (1.5%) (SAMHSA, 2000).

These differences in the rates of substance disorders between Caucasians and Hispanics can be due to several factors. For example, the ECA study took place almost 20 years ago, and since that time the Hispanic population has increased by 71.0%, mostly the result of a natural increase and migration (NIDA, 1998). Therefore, the ethnic differences in rates observed across these two studies may be attributable to a generational effect being seen over time as more and more Hispanics are being born and raised in the United States. In addition, all three of the studies mentioned employed different methodologies and focused on different age groups, with the NHSDA including people age 12 and up. More importantly, all of the studies mentioned above neglected to distinguish between the specific Hispanic subgroups, including Mexican-Americans, Cuban-Americans, and Puerto Ricans limiting the generalizability of the study results. Research has shown that there are cultural differences among the various Hispanic subgroups that could influence the rates of substance use (Booth, Castro, & Anglin, 1990; Cervantes & Arroyo, 1994; Chapa & Valencia, 1993; De La Rosa, Khalsa, & Rouse, 1990; Marin & VanOss Marin, 1991a; Martinez, 1994; Perez & Salazar, 1993; Sokol-Katz & Ulbrich, 1992).

Among Hispanics living in the United States, several studies have shown that the rates of substance use are highest among Puerto Ricans compared to other Hispanic subgroups, especially for illicit substances (Amaro, Whitaker, Coffman, & Heeren, 1990;

De La Rosa et al., 1990; NIDA, 1998). From 1982 to 1984, the Hispanic Health and Nutrition Examination Survey (HHANES) sampled household residents between the ages of 12 and 74 from three geographic areas of the United States having the largest proportions of Hispanic populations (i.e., Southwestern U.S., Northeastern U.S., and Dade County, Florida). Specifically, this survey compared the rates of various health risk behaviors, including substance use, among Mexican-Americans, Cuban-Americans, and Puerto Ricans. With regards to substance use, study results indicated that among those respondents ages 20 and older, the lifetime and current rates of marijuana and cocaine use were highest among Puerto Ricans compared to Mexican-Americans and Cuban-Americans. More specifically, the lifetime and current rates of marijuana use among Puerto Ricans were approximately 40.2% and 19.6% compared to 34.1% and 14.3% for Mexican-Americans, and 21.1% and 8.2% for Cuban-Americans. Likewise, the lifetime and current rates of cocaine use among Puerto Ricans were approximately 30.9% and 20.3% compared to 13.8% and 9.9% of the Cuban-Americans, and 13.0% and 6.5% of the Mexican-Americans (Amaro et al., 1990).

### ***Substance Use Among Adolescents***

Rates of substance use among adolescents in the general population have also been provided by several national surveys. For example, results from Monitoring the Future, a school-based study of 45,000 students in the United States, revealed that nearly two-thirds (65%) of the adolescents reported having tried cigarettes by the time they were in 12<sup>th</sup> grade, and more than one-third (35%) of 12<sup>th</sup> graders are current smokers (Johnston, O'Malley, & Bachman, 2000). Similarly, the Youth Risk Behavior Surveillance System (YRBSS), also a national school-based survey of 15,349 students in

grades 9 through 12 in 1999, revealed that 70% of the students reported having tried cigarettes at least once in their lifetime, and almost one-third (30%) of the students currently smoke. Although the rates for lifetime cigarette use were similar for Hispanics (73%) and Caucasians (71%), rates for current cigarette use were somewhat higher among Caucasians (39%) than Hispanics (33%) (Kann et al., 2000).

The use of alcohol among adolescents continues to be widespread. Results from Monitoring the Future indicate that four out of every five students (80%) surveyed have consumed alcohol by the end of 12<sup>th</sup> grade, and more than one-half (52%) reported having done so as early as the 8<sup>th</sup> grade. In addition, 62% of the 12<sup>th</sup> graders, and 25% of the 8<sup>th</sup> graders in 1999 reported having been drunk at least once in their life (Johnston et al., 2000). Similar results were reported by the YRBSS which indicated that 81% of the students reported having at least one alcoholic drink during their lifetime, and one-half (50%) reported having done so during the past month. When comparing rates across ethnic backgrounds, rates of alcohol use among Hispanics and Caucasians are virtually identical. Specifically, among Hispanic adolescents, the rates for lifetime and current alcohol use are 83% and 53% compared to 82% and 53% for Caucasians (Kann et al., 2000).

Results from Monitoring the Future indicate that more than one-half (55%) of U.S. adolescents have tried an illicit drug by the time they have completed high school. Marijuana is the most widely used illicit drug among adolescents with the annual prevalence rates among 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> grade students being 17%, 32%, and 38% respectively. Aside from marijuana, almost one-third (29%) of the adolescents surveyed have reported trying some other illicit substance by the end of 12<sup>th</sup> grade, with 21% of

12<sup>th</sup> graders reported having done so in the past 12 months (Johnston et al., 2000). Results reported by the YRBSS indicate that rates of illicit substance use are slightly, but consistently higher among Hispanic adolescents for both lifetime and current (past 30 days) drug use. For example, among Hispanic adolescents, the rates for lifetime and current marijuana use are 51% and 28% compared to 46% and 26% for Caucasians. Likewise, the rates for lifetime and current cocaine use, including crack, among Hispanics youths are 15% and 7% compared to 10% and 4% for Caucasians. Lastly, the lifetime rates of inhalant use are identical among Hispanics and Caucasians (16%), and current use was virtually the same for Hispanics (5%) and Caucasians (4%) (Kann et al., 2000). It is important to mention that both of the national studies mentioned above are school-based. Therefore, data was not collected on those students who were absent that day or who have dropped out of school all together. In fact, a report issued by the National Institute on Drug Abuse (1998) indicated that although Hispanics comprised approximately 13.8% of the population, they accounted for 37.6% of all school dropouts in 1996. More specifically, the dropout rate among Hispanic adolescents (29.4%) was four times higher than the rate among Caucasians (7.3%) (NIDA, 1998). As such, the reported rates of substance use among Hispanic adolescents participating in these school-based surveys are going to be lower than they actually are due to the high dropout rate among Hispanics. Additionally, these national studies failed to distinguish between the specific Hispanic subgroups, including Mexican-Americans, Cuban-Americans, and Puerto Ricans limiting the generalizability of the study results.

When comparing rates of adolescent substance across Hispanic subgroups, results from the HHANES showed marked differences with regards to marijuana and

cocaine use within the Mexican-American and Puerto Rican populations. For example, among those adolescents between the ages of 12 and 17, the lifetime and current rates of marijuana use were higher among Mexican-Americans (30.7% and 10.3%) than Puerto Ricans (25.4% and 9.4%). However, the lifetime and current rates of cocaine use were higher among Puerto Ricans (7.0% and 2.4%) compared to Mexican-Americans (4.2% and 0.7%) between the ages of 12 and 17. Among 18 to 24 year olds, the rates of both marijuana and cocaine use were consistently higher among Puerto Ricans than Mexican-Americans. For example, the lifetime and current rates of marijuana use among Puerto Ricans were 64.4% and 25.1% compared to 56.5% and 20.7% of the Mexican-Americans between the ages of 18 and 24. Likewise, the lifetime and current rates of cocaine use among Puerto Ricans were 37.2% and 17.5% compared to 18.2% and 4.9% of the Mexican-Americans within this age range (De La Rosa et al., 1990).

Statewide data concerning the rates of substance use among adolescents are also important because according to the 2000 U.S. Census, Puerto Ricans made up approximately 70.0% of the Hispanic population living in Connecticut (Census, 2001). In 1995, the University of Connecticut's Alcohol Research Center conducted the Adolescent Alcohol and Drug Use School (AADUS) Survey, a statewide survey of alcohol and drug use in a random sample of 3,995 students in grades 7 to 12 enrolled in public schools. In general, study results revealed that compared to regional and national data from the 1995 Monitoring the Future Survey, the rates of current cigarette, alcohol, and marijuana use were higher among Connecticut's students. When comparing the lifetime and current rates of substance use between Caucasian and Hispanic students, differences emerged concerning the rates of licit and illicit substances. For example, the lifetime and current



rates for cigarette use were relatively equal among Caucasian (54.5% and 28.5%) and Hispanic students (53.2% and 27.7%), but the rates for alcohol use were slightly higher among Caucasians (69.5% and 45.5%) than Hispanics (66.3% and 41.3%), consistent with national data. However, the lifetime and current rates of illicit substance use were higher among Hispanic students than Caucasians, also seen with national data. Specifically, among Hispanic students, the lifetime and current rates for marijuana use were 34.4% and 27.3% compared to Caucasian students whose rates were only 30.5% and 20.6%. Likewise, the lifetime and current rates of cocaine use among Hispanics were 3.5% and 2.4% compared to the rates among Caucasians being 2.8% and 0.8% (Hartwell, Ungemack, Babor, Stevens, & Del Boca, 1996).

### *Age of Onset of Substance Use*

Data from the YRBSS indicate that the ages of onset of both illicit and licit substance use are slightly earlier among Hispanic adolescents than among Caucasians, with the exception of cigarette smoking. For example, 14% of Hispanic students reported having tried marijuana prior to the age of 13 compared to only 9% of the Caucasian students (Kann et al., 2000). More than one-third (37%) of the adolescents surveyed in Monitoring the Future reported having used inhalants as early as 8<sup>th</sup> grade, which is approximately 13 or 14 years of age. However, these findings are not stratified by ethnic background so accurate comparisons cannot be made between Hispanic and Caucasian adolescents and the age of onset of inhalant use (Johnston et al., 2000). Nearly one-half of the adolescents (44%) reported having tried cigarettes as early as 8<sup>th</sup> grade, and 18% are current smokers (Johnston et al., 2000). When looking at the age of onset of cigarette smoking, no differences were noted between the Hispanic and Caucasian

adolescents. Among students who reported smoking an entire cigarette before the age of 13, 26% were Caucasians compared to 25% of the Hispanics (Kann et al., 2000). However, differences in rates emerged between Hispanic and Caucasian adolescents when looking at the age of onset of alcohol use, with 35% of the Hispanic students surveyed reported having drunk alcohol prior to the age of 13 years compared to 30% for Caucasians (Kann et al., 2000).

Statewide data provided by the AADUS reported that among 7<sup>th</sup> and 8<sup>th</sup> grade students in Connecticut, the rates for recent cigarette and alcohol use were higher among Caucasians (23% and 33%) than Hispanics (19% and 31%); however, Hispanic students had higher rates of recent marijuana use (14%) compared to Caucasians (10%). Among students in grades 9 through 12, the rates of recent cigarette use become relatively equal between Caucasians (32%) and Hispanics (33%), but the rates for recent alcohol use are still higher among Caucasians (53%) than Hispanics (48%). Lastly, the rates for recent marijuana use remain higher among Hispanic students (35%) than Caucasians (27%) in grades 9 through 12 (Hartwell et al., 1996).

### ***Substance Use Disorders Among Adolescents***

Although the rates of substance use among adolescents are quite high, only a small percent actually meet criteria for abuse or dependence. As such, there are limited data available regarding the prevalence of substance use disorders among adolescents in the United States and what is available primarily focus on Caucasians. Using data from the National Comorbidity Survey (NCS), Warner et al (1995) assessed the rates of any psychoactive substance dependence among 15 to 24 years olds (N=1,765). Study findings indicated that the prevalence rates for any lifetime and past year psychoactive

substance dependence were 7.3% and 3.3% (Warner, Kessler, Hughes, Anthony, & Nelson, 1995). Using the Diagnostic Interview Schedule for Children (DISC) based on DSM-III-R criteria, Cohen and colleagues (1993) conducted a longitudinal study of adolescents in New York State between the ages of 10 and 20 (N=776), assessing the rates of substance abuse. The results revealed that the rates of substance abuse increased with age. For example, among 14 to 16 year olds the rates for alcohol, marijuana, and other drug abuse were 3.5%, 1.4%, and 0.6%, but increased dramatically to 14.6%, 2.9%, and 1.1% among 17 to 20 years olds (Cohen et al., 1993). Lastly, Lewinsohn et al (1993) conducted a school-based study of adolescents in Oregon enrolled in grades 9 through 12 (N=1,710) and using a modified version of the Kiddie-Schedule for Affective Disorders and Schizophrenia (K-SADS) based on DSM-III-R criteria, determined the rates of substance abuse or dependence. The results reported that the rates for any drug, marijuana, alcohol, and “hard drug” abuse or dependence were 1.8%, 1.7%, 1.0% and 0.4% (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). Although the studies mentioned above provide estimates of substance use disorders among adolescents, they do not provide the rates of disorders across different ethnic backgrounds.

The statewide AADUS conducted in 1995 included a Personal Experience Screen Questionnaire (PESQ) used to identify those adolescents in need of further diagnostic assessment. In general, approximately 9% of the high school students and 4% of the junior high school students warranted additional evaluation based on their involvement with alcohol and drugs, and these rates were higher among Hispanics than Caucasians. More specifically, 11% of the Hispanic students met criteria for additional assessment and evaluation compared to only 8% of the Caucasians. Likewise, 8% of the Hispanic

students were referred for treatment and intervention compared to only 5% of the Caucasians (Hartwell et al., 1996).

### ***Sexual Behaviors Among Adolescents***

In addition to the widespread use of substances among Hispanic adolescents, as well as the high rates of HIV/AIDS among Hispanics, careful attention must also be paid to other HIV-related behaviors such as sexual activity. Data from the YRBSS indicate that 54% of the Hispanic students surveyed reported that they have had sexual intercourse compared to 45% of the Caucasians, and 36% of the Hispanic students have had sexual intercourse during the past 3 months compared to 33% of the Caucasians (Kann et al., 2000). In addition, the age of onset of sexual activity is earlier among Hispanic students than Caucasians with 9% of the Hispanic students surveyed indicated that they have had sexual intercourse prior to the age of 13 years, compared to 6% of the Caucasians (Kann et al., 2000). Hispanic students also reported having had more lifetime sexual partners than Caucasians, with 17% of the Hispanic adolescents indicating that they have had sexual intercourse with four or more partners compared to 12% of the Caucasian students (Kann et al., 2000). Regarding condom use, only 55% of both Hispanic and Caucasian adolescents reported that either they or their partner used a condom during last sexual intercourse, increasing their risk for contracting various sexually transmitted diseases including HIV and AIDS (Kann et al., 2000).

### ***Co-Occurrence of Substance Use and Sexual Behaviors Among Adolescents***

Given that the prevalence of both substance use and risky sexual behaviors are high among adolescents, and that these are significant risk factors for HIV/AIDS, it is

important to determine whether or not these behaviors co-vary. Jessor and Jessor (1977) were one of the first research groups to identify a co-varying relation among risky behaviors in their classic longitudinal study of personality and social and behavioral development among Caucasian high school and college students. Overall, adolescents who engaged in one problem behavior (e.g., problem drinker, marijuana user) tended to engage in other problem behaviors, including sexual. For example, 44% of the males and 67% of the females who used marijuana were also sexually active compared to 17% of the males and 20% of the females who had not used marijuana (Jessor & Jessor, 1977).

More recently, several studies have shown that earlier age of onset of sexual activity, four or more lifetime sexual partners, number of years sexually active, and non-condom use are related to the presence and severity of substance use behaviors among adolescents (Lowry et al., 1994; Rosenbaum & Kandel, 1990; Shrier, Emans, Woods, & DuRant, 1996). Using the 1990 YRBSS data, Lowry et al (1994) reported that the prevalence of sexual intercourse was lowest among students who reported no substance use (17%), higher among students who used alcohol or cigarettes (44%), and highest among students who used marijuana (79%), and cocaine or other illicit drugs (85%). Likewise, the rates of having four or more sexual partners were lowest among those students who reported no substance use (4%), higher among students who used alcohol or cigarettes (10%), and highest among students who used marijuana (30%), and cocaine or other illicit drugs (46%). Lastly, the rates of non-condom use during last sexual encounter were lowest among students who reported no substance use (44%), higher among students who used alcohol or cigarettes (48%), and highest among students who used marijuana (56%) and cocaine or other illicit drugs (64%) (Lowry et al., 1994).

Similar results were reported by Shrier et al (1996) who explored the association between the number of lifetime sexual partners, age of onset of first sexual encounter, number of years of sexual activity, and age of onset and presence of drug use behaviors in a random sample of high school students participating in the 1993 Massachusetts' component of the YRBSS. Bivariate analyses revealed that the frequency and age of onset of all problem behaviors were associated with the number of lifetime sexual partners ( $p \leq 0.005$ ). The strongest predictor of the number of lifetime partners was years of sexual activity, accounting for 27% of the variation. Age of onset of marijuana and cocaine use explained additional variation with the full model accounting for 34% of the variation in the number of lifetime sexual partners. In addition, the number of sexual partners was associated positively with the frequency and severity of lifetime and recent drug use (Shrier et al., 1996). Similarly, an analysis of the National Longitudinal Survey of Youth (NLSY) showed that adolescents who initiated sex at or before the age of 14 were more likely than others to have used marijuana and other illicit drugs, to report heavier lifetime involvement, and to be current drug users at the time they participated in the 1984 follow-up survey (Rosenbaum & Kandel, 1990).

Although the studies mentioned above clearly demonstrated that problem behaviors co-vary, the majority of them only focused on Caucasian adolescents. Costa et al (1995) set out to extend the earlier work of Jessor and Jessor (1977) by including Mexican-American Hispanics in a study of adolescent students in grades 7 through 9 in a metropolitan school district in the Rocky Mountain region. Similar to the results reported by Jessor and Jessor (1977), early onset of sexual activity among Hispanic and Caucasian youth was related to delinquent behavior, problem drinking, and marijuana use.

Furthermore, the results suggest that antecedent psychosocial unconventionality in adolescence was associated with an earlier age of onset of first sexual experience for both Caucasians and Hispanics (Costa, Jessor, Donovan, & Fortenberry, 1995). However, because the Hispanics used in this study were primarily Mexican-American, the results of this research cannot be generalized to other Hispanic subgroups such as Puerto Ricans.

As stated earlier, compared to other Hispanic subgroups, Puerto Ricans living in the United States have the highest rates of illicit substance use and the highest rates of HIV/AIDS. Despite these facts, there is a paucity of data available on adolescent substance use and risky sexual behaviors among Puerto Ricans living in the United States. One exception comes from a school-based study by Brook et al (1994) assessing the relationship between the stage of drug use and level of sexual involvement among African-American and Puerto Rican adolescents in grades 7 through 10 in the East Harlem area of New York City. In their classrooms, students completed self-reported questionnaires pertaining to their sexual activity, substance use, frequency of delinquent activities, and school achievement. A drug sequence measure was used to assess the relation between different problem behaviors, and subjects were assigned to one of four stages of drug use based on their level of involvement, ranging from no licit or illicit drug use to illicit drug use. Study findings indicated that the stage of drug use, and frequency of delinquent activities were related positively to the level of sexual involvement (Brook, Balka, Abernathy, & Hamburg, 1994). These findings support the results of other studies demonstrating that adolescents who participate in one problem behavior are also likely to participate in others. However, there are limitations to the study by Brook et al (1994). For example, the study used a school-based sample and students who were not in school

that day, or who have dropped out of school were not able to participate in the study, excluding high-risk adolescents. In addition, diagnostic interviews were not administered on the adolescents so information pertaining to drug abuse/dependence could not be determined. Lastly, information on family structure and history of alcohol and drug use disorders were not obtained. As discussed in the next section, a positive parental history of substance use disorders play a primary role in the development of substance use problems in offspring, a known risk factor for HIV/AIDS.

### ***Familial Risk Factors***

#### Family Study Methodology

One of the most salient and reliable risk factors for the development of substance use disorders is a positive family history (Merikangas et al., 1998c). Through the methods of genetic epidemiology, it is possible to study the interaction between both genetic and environmental factors that may contribute to the etiology of substance use disorders. The application of family study methodology is an important tool for determining whether a disorder, or propensity for such a disorder, is transmitted within families. The goal of the family study method is to identify an individual with a particular disorder (i.e., proband), and determine the presence or absence of similar disorders in their relatives. The rates of disorders can then be compared to persons who are unaffected with the disorder (i.e., controls) and their family members. Typically, probands are interviewed directly through the use of either structured or semi-structured diagnostic interviews in order to obtain specific diagnostic information pertaining to particular disorders. If available, direct interviews are also conducted on their first-degree relatives. At the very least, probands



provide family history information on all of their first-degree relatives in order to determine the presence or absence of particular disorders. Although the family study method is a powerful tool in the elucidation of familial risk factors, there are limitations. For example, because both genetic and environmental factors contribute to the etiology of particular disorders, it is not possible to discriminate among the potential sources of familial aggregation (Merikangas, Rounsaville, & Prusoff, 1992).

### Family Studies of Adult Relatives

A positive family history of substance use, including alcohol, has repeatedly been shown to be a reliable and consistent risk factor for the development of such disorders in adult relatives (Bierut et al., 1998; Hill, Cloninger, & Ayre, 1977; Kendler, Davis, & Kessler, 1997; Kosten, Rounsaville, Kosten, & Merikangas, 1991; Merikangas et al., 1998b; Merikangas et al., 1998c; Mirin, Weiss, Griffin, & Michael, 1991; Rounsaville et al., 1991). However, many of these findings are suggestive due to the various methodological strategies employed. For example, although several studies utilized both direct interviews and family history measures (Bierut et al., 1998; Hill et al., 1977; Kendler et al., 1997; Kosten et al., 1991; Merikangas et al., 1998b; Merikangas et al., 1998c; Mirin et al., 1991; Rounsaville et al., 1991), most of them did not use comparison control groups (Hill et al., 1977; Kosten et al., 1991; Mirin et al., 1991), and the majority of them only used adult populations (Bierut et al., 1998; Hill et al., 1977; Kendler et al., 1997; Kosten et al., 1991; Merikangas et al., 1998b; Merikangas et al., 1998c; Mirin et al., 1991; Rounsaville et al., 1991). In addition, although there is a vast amount of literature available on the familial aggregation of substance use disorders among Caucasians, none have focused on Hispanic populations living in the United States.

Merikangas et al (1998) conducted a controlled family study of 231 substance-abusing probands, 61 control probands, and 1,267 of their first-degree relatives. Diagnostic estimates were made based on the semi-structured Schedule for Affective Disorders and Schizophrenia (SADS) interview and/or structured family history interviews regarding each proband, spouse, and adult first-degree relative. The study results showed a high degree of familial aggregation of substance abuse with an 8-fold increased risk of drug disorders among relatives of probands with drug disorders. In addition, the rates of drug disorders among relatives directly corresponded to the increasing levels of more severe substance disorders in probands. This included, alcoholism (4% drug disorders in relatives), marijuana (8% in relatives), cocaine (10% in relatives), opioid abuse/dependence (15% in relatives) as compared with 1% among the relatives of controls (Merikangas et al., 1998c).

An uncontrolled family study conducted by Mirin et al (1991) collected demographic, clinical, and family history information on 350 hospitalized drug-dependent patients. In addition, using a structured clinical interview, family pedigree information was collected on 1,478 of the patient's first-degree relatives. Results indicated that 35% of the proband's relatives met criteria for at least one DSM-III Axis I disorder during their lifetime. In addition, 19.7% of the relatives met DSM-III criteria for alcohol abuse/dependence; 9.3% for other substance abuse disorders; and 9.3% for an affective disorder including major depression and bipolar/cyclothymic disorder. Moreover, the prevalence rate of alcoholism in the relatives of alcoholics was 24.3% compared to only 14.0% of the relatives of non-alcoholics ( $X^2=23.73$ ,  $df=1$ ,  $p<.005$ ), demonstrating specificity of transmission (Mirin et al., 1991).

Data collected on 5,877 subjects participating in the National Comorbidity Survey (NCS), a community-based survey, evaluated the presence of five psychiatric disorders in both subjects and their parents. Specifically, lifetime diagnoses for major depression, generalized anxiety disorder, antisocial personality disorder, alcohol abuse/dependence, and drug abuse/dependence was assessed using the CIDI based on DSM-III-R criteria. The results showed a high degree of familial aggregation of all five disorders. For example, among probands diagnosed with alcohol/abuse dependence, 17.8% had a parent with the same disorder compared to 10.1% of the probands without the disorder (O.R.=2.24). Likewise, among probands diagnosed with drug abuse/dependence, 5.5% had a parent with the same disorder compared to only 2.1% of the probands without drug abuse/dependence (O.R.=2.71) (Kendler et al., 1997).

#### High-Risk Studies of Adolescent Offspring

An important subtype of family study is the high-risk paradigm, which investigates unaffected children of parents with a particular disorder and compares them to children of controls without the disorder. High-risk studies are especially important for prevention efforts because they assist in the identification of premorbid risk factors that can help recognize children at risk for particular disorders based on the presence of similar disorders in their parents. To date, there have been several studies conducted focusing on the children of alcoholics (Chassin, Rogosch, & Barrera, 1991; Hill & Hruska, 1992; Johnson, Leonard, & Jacob, 1989; Martin & Sher, 1994; Reich, Earls, Frankel, & Shayka, 1993; Schuckit & Smith, 1996; Sher, Walitzer, Wood, & Brent, 1991); however, there have been very few controlled studies of offspring of drug abusers (Martin et al., 1994; Merikangas, Dierker, & Szatmari, 1998a; Miles et al., 1998). In

general, findings from these studies indicate that parental substance abuse, including alcoholism, is a strong to moderate risk factor for similar disorders in the offspring compared to children of non-substance abusers. Specifically, the results of these studies confirm a strong degree of familial aggregation of substance disorders from affected parents to their offspring compared to children of non-substance abusers (Chassin et al., 1991; Hill & Hruska, 1992; Johnson et al., 1989; Martin et al., 1994; Martin & Sher, 1994; Merikangas et al., 1998a; Miles et al., 1998; Moss, Majumder, & Vanyukov, 1994; Reich et al., 1993; Schuckit & Smith, 1996; Sher et al., 1991). Although there have been several high-risk studies conducted on children of parents with a substance use disorder, to our knowledge, none have focused on Hispanic adolescents living in the United States.

Chassin et al (1991) conducted a controlled family study assessing the magnitude and specificity of parental alcoholism as a risk factor for alcohol and drug use in adolescents. The subjects consisted of 246 adolescents who had at least one biological alcoholic parent and 208 demographically matched control subjects who did not have an alcoholic parent. Lifetime DSM-III diagnoses of alcoholism abuse/dependence, affective disorders (major depression or dysthymia), and antisocial personality disorder were obtained with a computerized version of the DIS. The results indicated that among children of alcoholics, the lifetime, past year, and current (past 3 months) rates for alcohol use were 57.4%, 45.2%, and 27.8% compared to 29.8%, 23.8% and 12.9% among offspring of controls. In addition, among children of alcoholics, the rates for lifetime, past year, and current (past 3 months) drug use were 22.6%, 16.5%, and 9.6% compared to 8.2%, 5.8%, and 2.4% among offspring of controls (Chassin et al., 1991).

More recently, Merikangas et al (1998) reports the results of a high-risk study of adolescents (N=192) under the age of 18 whose parents served as probands (N=123) in a controlled family study of comorbidity of substance use and anxiety disorders. Direct interviews were administered on probands using the semi-structured SADS, and the offspring were administered a modified version of the K-SADS. The main study findings revealed that the offspring of substance probands reported the most alcohol use (15.6%) followed by the offspring of anxiety probands (10.3%) compared to the offspring of controls (5.3%). The study also assessed the level of drug use by combining various drug types into one category characterizing experimentation. Drug use (tried/used  $\geq 1$  time) was highest among the offspring of drug probands (14.3%) followed by the offspring of anxiety probands (8.6%) compared to no use among the offspring of controls. Lastly, smoking at least one to two times per week was significantly elevated among the offspring of substance probands (24.7%) and the anxiety probands (13.8%) compared to the offspring of controls (1.8%) (Merikangas et al., 1998a).

Miles et al (1998) conducted a family study utilizing both the direct interview and family history method and compared 100 adjudicated male adolescents in treatment for substance abuse to 100 demographically matched controls. Subjects over the age of 18 years were interviewed directly using the DIS and subjects under the age of 18 were interviewed using the DISC. Direct interviews and family history information were also obtained from all consenting first degree relatives and any other household member residing with the proband for at least one year. As expected, relatives of substance abusing probands displayed greater symptoms for nicotine dependence, alcohol dependence, and drug dependence compared to the controls. In addition, relatives of

substance abusing probands showed more severe substance related disorders compared to relatives of controls (Miles et al., 1998). However, to our knowledge there have been no high-risk studies conducted on Hispanic adolescents living in the United States.

### ***Sociocultural Risk Factors***

Although the evidence clearly demonstrates that a positive family history of substance abuse strongly contributes to the use and abuse of drugs by adolescents, Hispanic adolescents living in the United States are subjected to additional demographic, social, and cultural risk factors. For example, many Hispanics living in the United States are subjected to poverty and lack school and employment opportunities. In addition, many Hispanics are targets of discrimination and are torn between adapting a new culture, and losing their cultural identity (Chapa & Valencia, 1993; De La Rosa et al., 1990; Perez & Salazar, 1993). Researchers have also examined the risk and protective factors associated with family structure and familism, a cultural value that involves an individual's strong identification with and attachment to their nuclear and extended families. The value of familism has been shown to be a very salient and important culture-specific value among Hispanics, and central to specific subgroups such as Mexican-Americans, Puerto Ricans, and Cubans. Along with familism comes a strong sense of loyalty, reciprocity, and solidarity among members of the same family which appears to protect individuals against physical and emotional stress and serves to protect against deviant behaviors such as drug use (Marin & VanOss Marin, 1991b). However, because there is a disintegration of the extended family system when families migrate from Puerto Rico to the United States, families living in the United States, particularly

the adolescents, may be at greater risk for participating in risky sexual behaviors and substance use (De La Rosa et al., 1990).

Other researchers have focused on intergenerational changes in ethnic identity within families which has also been shown to be a risk factor for substance use among Hispanic adolescents, particularly if the children are more acculturated than their parents (Rogler, Cooney, & Ortiz, 1979; Velez & Ungemack, 1989). In addition the level of acculturation has been shown to influence and predict certain health-related behaviors, including cigarette smoking, alcohol use, sexual initiation, and risky sexual behavior (Booth et al., 1990; Brook, Whiteman, Balka, Win, & Gursen, 1997; Cuadrado & Lieberman, 1998; De La Rosa et al., 1990; Hines & Caetano, 1998; Khoury, Warheit, Zimmerman, Vega, & Gil, 1996; Marin & Flores, 1994; Marks, Cantero, & Simoni, 1998; Szalay, Canino, & Vilov, 1993). A literature review of Hispanic substance use conducted by Booth et al (1990) suggest that regardless of the specific ethnic background (e.g. Mexican, Cuban, Puerto Rican), low school achievement, rebelliousness, and early sexual behavior are associated with early drug use (Booth et al., 1990).

### ***Summary***

It has been confirmed that the rates of HIV/AIDS are highest among Hispanics compared to other ethnic groups. For example, in 1999, Hispanics represented 13% of the total United States' population but accounted for 19% of the new AIDS cases, and the incidence rate of AIDS among Hispanics was 25.6% compared to 7.6% for Caucasians. In addition, between 1992 and 1998 the incidence of AIDS among Caucasians has decreased by 10%, but has increased by 2% among Hispanics (CDC, 1999). Several

studies have shown that among U.S. Hispanics, Puerto Ricans have the highest incidence of HIV/AIDS (Hopkins, 1987; Montoya et al., 1999; Robles et al., 1990).

Initially, population-based estimates of substance use disorders provided by several national studies did not demonstrate that rates of such disorders were higher among Hispanic adults living in the United States compared to Caucasians (Anthony & Helzer, 1991; Helzer et al., 1991; Kessler et al., 1994; SAMHSA, 2000). However, studies of Hispanics living in the United States have shown that the rates of substance use are highest among Puerto Ricans compared to other Hispanic subgroups, especially for illicit substances (Amaro et al., 1990; De La Rosa et al., 1990; NIDA, 1998).

Concerning adolescent substance use, results from the YRBSS show slightly higher rates of use among Hispanic adolescents than Caucasians, particularly for illicit substance use. Additionally, when comparing rates of adolescent substance across Hispanic subgroups, results from the HHANES showed the lifetime and current rates of illicit drug use were highest among Puerto Rican adolescents (De La Rosa et al., 1990). Results from AADUS indicate that rates of current cigarette, alcohol, and marijuana use were higher among Connecticut's students, and Hispanic students, primarily of Puerto Rican descent, had the highest rates of illicit substance use (Hartwell et al., 1996).

Concerning other HIV-related behaviors, compared to Caucasian adolescents, the available data indicate Hispanics have sexual intercourse at an earlier age, have more sexual partners, and use condoms less often (Kann et al., 2000). Several studies have shown that adolescents who use cigarettes, alcohol, marijuana, and other illicit drugs are more likely to be sexually active at a younger age, have more sexual partners, and not use condoms than those adolescents who do not (Jessor & Jessor, 1977; Lowry et al.,



1994; Rosenbaum & Kandel, 1990; Shrier et al., 1996). Costa et al (1995) extended the work of Jessor and Jessor (1977) by including Hispanics, and found that early age of onset of sexual activity was related to delinquent behavior, problem drinking and marijuana use (Costa et al., 1995). Although Puerto Ricans living in the United States have the highest rates of illicit substance use and the highest rates of HIV/AIDS, there is sparse information available on adolescent substance use and risky sexual behaviors among Puerto Ricans. One recent study by Brook et al (1994) found a positive relation between the stage of drug use and level of sexual activity among Puerto Rican adolescents in grades 7 through 10 in the East Harlem area of New York City (Brook et al., 1994). However, because Brook et al (1994) used a school-based sample, students who were not in school that day, or who have dropped out of school, did not participate in the study, excluding high-risk adolescents. Additionally, information pertaining to parental substance use disorders were not obtained.

A positive family history of substance use, including alcohol, has repeatedly been shown to be a reliable and consistent risk factor for the development of such disorders in adult relatives (Bierut et al., 1998; Hill et al., 1977; Kendler et al., 1997; Kosten et al., 1991; Merikangas et al., 1998b; Merikangas et al., 1998c; Mirin et al., 1991; Rounsaville et al., 1991). In addition, family studies of high-risk children have shown that parental substance abuse, including alcoholism, is a strong to moderate risk factor for similar disorders in the offspring compared to children of non-substance abusers. Specifically, the results of these studies confirm a strong degree of familial aggregation of substance disorders from affected parents to their offspring compared to children of non-substance abusers (Chassin et al., 1991; Hill & Hruska, 1992; Johnson et al., 1989; Martin et al.,

1994; Martin & Sher, 1994; Merikangas et al., 1998a; Miles et al., 1998; Moss et al., 1994; Reich et al., 1993; Schuckit & Smith, 1996; Sher et al., 1991). Aside from familial risk factors, Hispanic adolescents living in the United States are subjected to additional demographic, social, and cultural risk factors that increase their risk for substance use, and risky sexual behaviors, that can ultimately lead to HIV/AIDS.

### ***Goals of Present Study***

The goal of the present study is to investigate the relation between adolescent substance use and sexual behaviors among Puerto Rican adolescents in the greater New Haven area at high- and low-risk for substance use by virtue of parental substance use disorders, including alcohol. Specifically, the study will test the following two hypotheses: (1) risky sexual behavior among adolescents (e.g., early age of first sexual experience; multiple sex partners; non-use of condoms) will be positively associated with the occurrence of substance use (e.g., cigarettes; alcohol; marijuana; and other drugs); and (2) this relation (i.e., the problem behavior syndrome) will be more common among the offspring of probands with a substance use disorder compared to the offspring of parents without a substance use disorder.

## **Methods**

### ***Sample***

The study sample comprises 371 adolescents between the ages of 12 and 18 who participated in a large-scale family study of Puerto Ricans living in the greater New Haven area. The first goal of the original family study was to elucidate the familial patterns of substance use disorders, alcohol use disorders, and psychiatric disorders among first-degree relatives. The second goal of the original study was to identify risk and protective factors at the individual, familial, and environmental level for Puerto Rican adolescents at high- and low-risk for the development of substance use problems by virtue of parental substance use disorders and/or psychiatric disorders. As such, the parents of the adolescents used in the present study served as probands in the original family study and were recruited from public outpatient substance abuse and/or mental health facilities primarily serving Hispanic populations, and from within the general community. The community probands were recruited door-to-door from the same neighborhoods inhabited by those probands recruited from the clinics in order match the demographic and environmental characteristics. In general, probands were eligible for participation if they had offspring between the ages of 12 and 18 and were willing to be interviewed along with their spouse/co-parent, adolescent offspring, and other household members. Probands were excluded from the study if they were unable to comprehend the assessments, showed symptoms of schizophrenia or organic brain disorder, or refused to provide consent for participation in the study. These inclusion criteria resulted in 239 probands who had 371 adolescent offspring between the ages of 12 and 18.

### ***Demographic Characteristics of Puerto Ricans Living in New Haven***

Since 1990, the Puerto Rican population living in New Haven has increased from approximately 8% to 14%, and continues to grow (Census, 2001). In general, the majority of the families participating in this large-scale family study resided in two sections of New Haven containing high concentrations of Puerto Ricans. More specifically, according to the 1990 census tract data, the majority of these Puerto Rican families resided in neighborhoods where 68% of the households were single-headed, containing an average of 1.2 biologic or adopted children. In addition, 12% of these neighborhood residents had less than a 9<sup>th</sup> grade education, 18% had less than a high school education, and although 21% completed high school, only 4% had a bachelor's degree. Additionally, among persons residing in these neighborhoods, only 17% of the males and 17% of the females were currently employed, and the average per capita income was only \$7,257 per year (Census, 1990).

### ***Procedures***

#### **Adult Diagnostic Interview**

Proband diagnoses of substance, alcohol, and psychiatric disorders were based on direct interviews administered by ethnically matched interviewers in English or Spanish, depending on the preference of the proband, using the Composite International Diagnostic Interview (CIDI), version 2.1 (WHO, 1997). The CIDI is a structured diagnostic interview developed for use by trained lay interviewers with no clinical experience, and produces psychiatric diagnoses based on DSM-IV (APA, 1994) and ICD-10 (WHO, 1989) criteria. The demographic module assessed the proband's gender, age,

birth date, marital status, educational background, employment information, place of birth, language preference, and other socio-demographic indicators. The following sections of the CIDI were administered: nicotine dependence, phobic states and other anxiety disorders, depression and dysthymia, mania and bipolar disorder, post-traumatic stress disorder, alcohol abuse/dependence, and drug abuse/dependence, and some questions pertaining to eating disorders. The antisocial personality disorder module used in the Diagnostic Interview Schedule (DIS) was also added to the interview (Robins, Helzer, Cottler, & Goldring, 1989; Robins, Helzer, Croughan, Williams, & Spitzer, 1981).

The CIDI has been well documented to have high levels of diagnostic coverage, test-retest and procedural reliability, and validity (Farmer, Jenkins, Katz, & Ryder, 1991; Farmer, Katz, McGuffin, & Bebbington, 1987; Janca, Robins, Cottler, & Early, 1992; Semler, Von Cranach, & Wittchen, 1987; Spengler & Wittchen, 1989; Wittchen, Burke, Semler, & Pfister, 1989; Wittchen et al., 1991). The first field-testing of the CIDI for cross-cultural use was carried out in 1987 by 17 countries, including Puerto Rico (Rubio-Stipec, Bravo, & Canino, 1991). The inter-rater reliability of the CIDI and its cross-cultural feasibility showed percentage agreements for all diagnoses above 90% and highly significant kappa values (Wittchen et al., 1991). WHO CIDI field trials have shown adequate reliability and validity of the mood and anxiety (Wittchen, 1994) as well as the alcohol and drug modules (Cottler, Robins, & Helzer, 1989; Janca et al., 1992; Rubio-Stipec, Peters, & Gavin, 1999; Wittchen, 1994). The reliability and validity of the DIS for use in the Puerto Rican adult population has been previously established (Canino, Bird, Shrout, Rubio-Stipec, & al., 1987).

Based upon the CIDI scoring algorithms, probands were classified into one of four hierarchical diagnostic groups based on a lifetime history of DSM-IV disorders: (1) drug abuse or dependence (N=48); (2) alcohol abuse or dependence (N=32); (3) major depression, dysthymia, bipolar, panic with or without agoraphobia, agoraphobia, generalized anxiety disorder, social phobia, three or more specific phobias, antisocial personality disorder (N=96); (4) no disorder (N=63). It is important to mention that 50% of the drug probands also met criteria for alcohol abuse/dependence, and the most commonly used illicit drugs were cocaine (33%), marijuana (27%), and opiates (18%). In accordance with the aims of the original family study, probands were placed into the diagnostic groups listed above in order to evaluate the specific effects that proband substance use disorders and/or psychopathology have on the risk of similar disorders in the adolescent offspring. Therefore, these proband groups were also used to classify the risk-status of the adolescent participants in the present study. Specifically, in order to determine whether or not parental substance use disorders represent *specific* risk factors in the adolescents, it was important to compare the offspring of probands with substance use disorders to those of normal controls as well as to those of probands with psychiatric disorders. In general, the inclusion of a psychiatric comparison group allows for conclusions regarding the specificity of associations between a particular disorder and risk factors for that disorder. Although the probands in the psychiatric group do not have a substance use disorder, they are nonetheless impaired and may present risk for these problems. This is especially important given that psychiatric disorders, particularly anxiety, affective, and antisocial personality disorder, are highly comorbid among substance abusers (Grant, 1995; Grant & Hartford, 1995; Helzer & Pryzbeck, 1988;

Kessler et al., 1997; Merikangas, Risch, & Weissman, 1994; Merikangas et al., 1998b; Regier et al., 1990; Rounsaville et al., 1991; Swendsen et al., 1998).

### Child Diagnostic Interview

Psychiatric disorders in the children between the ages of 12 and 18 were assessed in English or Spanish, depending on the preference of the child, using the Computerized Diagnostic Interview for Children (DISC), version IV, administered by ethnically matched interviewers (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The DISC is the premier structured instrument used by non-clinicians to establish psychiatric diagnoses in children and adolescents. Multiple informants (i.e., youth and parent) are interviewed using schedules with parallel formats to assess disorders in children and adolescents.

The following sections of the past-year module of the DISC were administered: social phobia, specific phobia, separation anxiety disorder, panic disorder, agoraphobia, generalized anxiety disorder, post-traumatic stress disorder, major depressive disorder/dysthymia, attention-deficit-hyperactivity-disorder, conduct disorder, oppositional defiant disorder, nicotine dependence, alcohol use disorders, and other substance use disorders.

Partial results have been recently reported for the test-retest reliability of the English version of the DISC-IV on 'last 12-months' reports (Shaffer et al., 2000). Fair to moderate agreement (kappas from 0.4 to < 0.8) was observed for parental reports of children between the ages of 9 and 17 for the following specific diagnoses: generalized anxiety, social phobia, separation anxiety, oppositional defiant, conduct disorders, major depression and attention deficit hyperactivity disorder (ADHD). For the corresponding

youth reports, fair to moderate agreement was also observed for most diagnoses, but substantial concordance was reported for major depression, and slight for social phobia. In a recent reliability study of the Spanish translation of the DISC-IV in a clinic sample, parent informants were shown to be fairly to moderately reliable (kappa range: .40-.80) when reporting about their children's psychopathology. Children between the ages of 11 and 17 were moderately to substantially reliable (kappa values at least .60) when reporting about disruptive and substance-related disorders but were less reliable (kappa values less than .40) when reporting about anxiety and depressive disorders (Bravo, Under Review).

#### Self Report Questionnaires

All adolescents completed a battery of self-report questionnaires that examined a wide array of individual-, familial- and sociocultural-level risk and protective factors for substance use disorders and other deviant behaviors. Most of the assessments used in the study have been tested either in Puerto Rico as part of the Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) field trials or on Hispanic populations in the United States. Respondents completed the paper-and-pencil battery in either English or Spanish, depending on their preference, after successful completion of a literacy test. In addition, the self-report questionnaires were completed in private and respondents were ensured that all of their responses would be confidential.

It has been well-documented that sensitive issues, such as drug use and sexual behaviors, are less likely to be reported during a face-to-face interview (Locke et al., 1992), and more likely to be reported through the use of anonymous paper-and-pencil self-report questionnaires (Lessler & O'Reilly, 1997; Turner et al., 1998). In addition, the



vast majority of the literature suggests that self-reports can be a reasonably accurate and reliable measure of adolescent drug use (Johnston & O'Malley, 1985; Oetting & Beauvais, 1990; O'Malley, Bachman, & Johnston, 1983). As such, the present study relies primarily on data from two questionnaires described in detail below.

#### *Sexual History Questionnaire*

This questionnaire consists of 6 questions addressing sexual behaviors including age of onset of first sexual encounter, number of sexual partners, use of condoms during sexual intercourse, and substance use before sexual intercourse. These items were taken from the Center for Disease Control's (CDC) Youth Risk Behavior Surveillance System (YRBSS), also a national school-based survey of students, including Hispanics, in grades 9 through 12 that assess a variety of health-risk behaviors among adolescents (Kolbe, 1990; Kolbe, Kann, & Collins, 1993).

#### *Substance Use*

The Substance Use questionnaire is an 8-item scale designed to measure lifetime, past year, and current (past 30 days) drug and alcohol use among adolescents. This scale is a modified version of the questionnaire used in the National Institute on Drug Abuse's (NIDA) Monitoring the Future study which is a series of large, annual surveys of nationally representative samples of students, including Hispanics, in public and private secondary schools throughout the coterminous United States (Bachman, Johnston, & O'Malley, 1996; Johnston, O'Malley, Schulenberg, & Bachman, 1996). The questionnaire elicits information pertaining to cigarette, alcohol, marijuana, inhalant, heroin, cocaine/crack, and other drug use. Subjects select the response that is most appropriate based on the quantity and frequency of their use.

## ***Definitions of Variables***

### Sexual Behaviors

The variables pertaining to sexual activity of the adolescent offspring were taken from the previously described questionnaire. The six dichotomous dependent variables reflecting the sexual behaviors included: *Ever Sex*, *Current Sex*, *Early-Onset Sex*, *Multiple Sex Partners*, *Condom Non-Use*, and *Risky Sexual Behavior*. *Ever Sex* indicates whether each adolescent reported ever having sexual intercourse. The *Current Sex* variable was created by collapsing across the response category resulting in a dichotomous “yes” or “no” variable indicating whether each adolescent reported having sex during the past three months. Based on the question pertaining to age of onset of first sexual intercourse, the *Early-Onset Sex* variables were created by collapsing the response category, ranging from ages 8 to 17, to indicate whether each individual reported having sexual intercourse at or before the age of 12 or at or before the age of 13. Similarly, the *Multiple Sex Partners* variable identifies adolescents who reported having sexual intercourse with three or more partners. The variable for *Condom Non-Use* indicates whether or not a condom was used the last time the respondent had sexual intercourse. As a summary of high-risk sexual activity, the *Risky Sexual Behavior* variable was created based on any positive responses to *Early-Onset Sex*, *Multiple Sex Partners*, and *Condom Non-Use*.

Cronbach’s alpha for three questions yielding continuous response sets was -.60. Although the reliability is low, this is not entirely surprising given the different types of behaviors being measured by these items. The age of onset of sexual intercourse was significantly correlated with the number of lifetime sexual partners ( $r = -.44$ ,  $p < .001$ ), and

to the number of sexual partners during the past 3 months ( $r = .49$ ,  $p < .001$ ). However, the age of onset of sexual intercourse was poorly related to the number of sexual partners during the past 3 months ( $r = -.15$ ,  $p = .1177$ ). The last two items of this questionnaire had dichotomous response sets. As such, lifetime use of alcohol or drugs prior to sexual intercourse was not associated with the use of condoms ( $\chi^2 = .52$ ,  $p = .47$ ). These overall results suggest that the items used in this questionnaire measure different types of sexual behaviors that are not necessarily related to one another, as some of the questions measure sexual activity in general and some measure risky sexual behaviors.

### Substance Use

All variables pertaining to substance use were taken from the NIDA's Monitoring the Future Study described above. Because the frequency of most substance use indicators was low, a series of dichotomous variables were created to identify adolescents who did and did not report having ever used the following substances: *Cigarette Use*, *Alcohol Use*, and *Marijuana Use*. In order to elucidate any lifetime substance use across different drug categories, the dichotomous variable *Any Substance Use* reflects any positive response to the questions pertaining to lifetime use of cigarettes, alcohol, marijuana, heroin, cocaine/crack, and other drugs. Lastly, because this substance use questionnaire did not ask about the age of onset of substance use, this information was extracted from the child DISC interview, if available. The Cronbach's alpha for this scale was .87, indicating that this questionnaire was a highly reliable measure of substance use among this sample of adolescents.

### Co-Occurrence of Sexual Behaviors & Substance Use

In order to determine whether or not a co-varying relationship exists between adolescent sexual behaviors and substance use, a series of combination variables were created. Specifically, because the level of risk for substance use may differ according to the specific sexual behaviors, each of the six sexual behavior variables (*Ever Sex*, *Current Sex*, *Early-Onset Sex*, *Multiple Sex Partners*, *Condom Non-Use*, and *Risky Sexual Behavior*) were combined with each of the four substance use variables (*Any Substance Use*, *Cigarette Use*, *Alcohol Use*, and *Marijuana Use*), resulting in twenty four combination variables (e.g., *Ever Sex & Any Substance Use*, *Ever Sex & Cigarette Use*, *Ever Sex & Alcohol Use*, etc.). Each of the combination variables were dichotomous indicators of whether or not the respondents had engaged in both the sexual and substance use behaviors.

### ***Plan of Analyses***

The SAS package, version 8.1 (SAS Institute, 1999-2000), was used for all statistical analyses. For the discrete variables, chi-square tests for contingency tables were used to determine whether the rates differed across the proband groups. Analysis of variance procedures (PROC GLM) were used to test whether or not continuous variables, such as age, differed across the proband groups. A series of logistic regressions were performed to determine whether a substance use disorder, including alcohol, among the parent probands was related to the sexual behaviors and substance use of the adolescent offspring. Specifically, two independent variables were tested: 1) an alcohol disorder in the proband and 2) a drug disorder in the proband. Separate logistic regressions were conducted for each of the indicators of adolescent sexual behavior and substance use. In

each model, several covariates were added including gender and age of the adolescent offspring as well as comorbid psychiatric disorders among the parent probands. More specifically, because rates of adolescent substance use and sexual behaviors typically vary by gender and age, these were added as covariates. Additionally, it has been well documented that psychiatric disorders, particularly anxiety, affective, and antisocial personality disorder, are highly comorbid among substance abusers (Grant, 1995; Grant & Hartford, 1995; Helzer & Pryzbeck, 1988; Kessler et al., 1997; Merikangas et al., 1994; Merikangas et al., 1998b; Regier et al., 1990; Rounsaville et al., 1991; Swendsen et al., 1998). Therefore, each of the models also controlled for psychiatric disorders among the parent probands.

## Results

### *Proband and Offspring Characteristics*

The demographic and diagnostic characteristics of the probands and their offspring are presented in Table 1. Among probands, significant group differences were detected for gender and for recruitment source. Specifically, although the proportion of drug probands is relatively equal between males and females, the majority of the alcohol, psychiatric, and normal probands were female. This is primarily due to the fact that in order to be eligible to participate in the study, probands needed to have offspring between the ages of 12 and 18 who either reside in the home or in the area. Therefore, males who did not reside with their children, or whose children were not available to be interviewed, were excluded from being probands. This resulted in a significantly larger number of female probands who were the primary care takers of the adolescent offspring. In addition, more than one-half of the drug and alcohol probands were recruited from a clinic compared to the psychiatric and normal probands, who were primarily recruited from the community. Lastly, almost one-half of the total sample have less than a high school education, are presently employed, and earn less than \$10,000 per year.

The distribution of comorbid psychiatric disorders among the probands, by proband group, appears in Table 2. Approximately one-half of the drug probands and more than one-third of the alcohol probands met criteria for an affective disorder (i.e., major depression, dysthymia, or bipolar disorder). In addition, more than one-half of the drug probands and one-quarter of the alcohol probands met criteria for an anxiety disorder (i.e., generalized anxiety disorder, panic disorder, agoraphobia, social phobia,

specific phobia, or post traumatic stress disorder). Interestingly, more than one-third of the drug probands and almost one-quarter of the alcohol probands met criteria for post-traumatic stress disorder. Additionally, the rate of antisocial personality disorder was particularly elevated among the drug probands. Regarding the probands in the psychiatric group, three-quarters met criteria for an affective disorder and more than one-half met criteria for an anxiety disorder.

The distribution of the 371 offspring according to the parent proband lifetime diagnostic group was as follows: 72 children of probands with a drug disorder; 52 children of probands with an alcohol disorder; 149 children of probands with a psychiatric disorder other than drug or alcohol; and 98 children of probands with no history of a psychiatric disorder. No significant group differences were detected for gender or age. Specifically, there were equal proportions of males and females approximately 14.4 years of age.

### ***Adolescent Sexual Behaviors***

Table 3 reports the rates of adolescent sexual behaviors according to proband group. In general, nearly one-third (32.7%) of the total sample of adolescents surveyed reported having had sexual intercourse at least once in their lifetime, with males exhibiting higher rates than females ( $X^2=5.89$ ,  $df=1$ ,  $p=.0152$ ). Almost one-third (30.5%) of the sexually active adolescents reported having had sexual intercourse for the first time at or before the age of 12, with males exhibiting higher rates of early-onset set ( $X^2=10.40$ ,  $df=1$ ,  $p=.0013$ ). By the age of 13, more than one-half (48.3%) of the sexually active adolescents have had sexual intercourse for the first time with higher rates again among males ( $X^2=13.07$ ,  $df=1$ ,  $p=.0003$ ). More than one-third (37.3%) of the sexually

active adolescents reported having had sex with 3 or more partners, with higher rates among males than females ( $X^2=12.83$ ,  $df=1$ ,  $p=.0003$ ). The majority of the sexually active adolescents (63.6%) reported having had sex during the past 3 months, and although not significant, these rates were surprisingly higher among females (69.4%) than males (59.4%). Approximately one-third (34.2%) of the sexually-active adolescents reported that either they or their partner did not use a condom the last time they had sex, with females exhibiting higher rates than males ( $X^2=5.20$ ,  $df=1$ ,  $p=.0226$ ). In sum, more than three-quarters of the sexually active adolescents (77.1%) reported having engaged in at least one of these risky sexual behaviors in their lifetime, with somewhat higher rates among males.

Logistic regressions were performed to test the association between adolescent sexual behaviors and proband alcohol and drug use disorders, adjusting for age and gender of the adolescent and comorbid psychopathology of the parent proband. Shown in Table 3, the only sexual behavior significantly related to disorders in the proband was non-use of condoms. More specifically, the children of probands with an alcohol use disorder were 3 times more likely to not use a condom compared to the children of probands without an alcohol use disorder. However, the children of probands with a drug use disorder were not at greater risk for any of these behaviors.

### ***Adolescent Substance Use***

The rates of adolescent substance use by proband group are presented in Table 4. Overall, nearly one-half (45.8%) of the adolescents surveyed reported having used cigarettes, alcohol, marijuana, heroin, cocaine/crack, or other drugs at least once in their lifetime. Regarding the use of nicotine, 24.5% of the adolescents reported having



smoked cigarettes at least once or twice in their lifetime, and more than three-quarters (77.3%) reporting having done so during the past year. Almost one-half (43.5%) of the adolescents reported having drunk alcohol at least once in their lifetime, with the vast majority (71.9%) having drunk during the past year. Although comparatively lower rates of lifetime marijuana use were reported in this sample of adolescents (16.2%), more than three-quarters (77.2%) of the marijuana smokers reported having used marijuana during the past year. Though the rates of use were generally slightly higher among females than males (with the exception of marijuana), no gender differences were statistically significant.

Logistic regressions were performed to test the association between adolescent substance use and proband alcohol and drug use disorders, adjusting for age and gender of the adolescent and comorbid psychopathology of the parent proband. As seen in Table 4, the children of probands with a drug disorder were almost 2 times more likely to report having ever used any substance (cigarettes, alcohol, marijuana, heroin, cocaine/crack, or other drugs) compared to the children of probands without a drug disorder. When looking at specific drugs, these adolescents were more than 2 times more likely to smoke cigarettes, and more than 2½ times as likely to smoke marijuana. However, the offspring of probands with an alcohol use disorder were not at greater risk for substance use compared to offspring of probands without an alcohol use disorder.

### ***Co-Occurrence of Adolescent Sexual Behaviors and Substance Use***

One of the major aims of this study was to demonstrate a co-varying relationship between sexual behaviors and substance use among adolescents. As illustrated in Table 5, when comparing the rates of specific sexual behaviors among adolescents who have

ever used drugs to those who have not, the only significant group differences were for ever having had sexual intercourse. More specifically, adolescents who reported any lifetime substance use were 9 times more likely to have had sexual intercourse compared to the adolescents who have not used drugs. None of the other sexual behavior variables (e.g., *Early-Onset Sex*, *Current Sex*, *Multiple Sex Partners*, *Condom Non-Use*, and *Risky Sexual Behavior*) were significantly related to the occurrence of adolescent substance use, and did not increase the risk for such behaviors. However, when comparing the rates of lifetime substance use among sexually active adolescents to those of sexually inactive adolescents, significant group differences were detected for all four of the drug variables. In terms of risk, Table 6 illustrates that sexually active adolescents were 9 times more likely to have ever used a substance than sexually inactive adolescents. When looking at specific substances, sexually active adolescents were nearly 8 times more likely to have used cigarettes, almost 8 ½ times more likely to have used alcohol, and approximately 12 times more likely to have used marijuana than sexually inactive adolescents.

These significant group differences remained when stratifying across gender; however, the level of risk for males and females differed across all four drug categories. For example, sexually active males were 9 ½ times more likely to have ever used a substance than sexually inactive males, but sexually active females were nearly 12 times more likely. Likewise, sexually active males were 11 times more likely have used cigarettes compared to sexually active females who were only 6 ½ times more likely. Concerning the lifetime use of alcohol, the risk for sexually active females was significantly higher than that of males. Specifically, sexually active females were almost 11 ½ times more likely to have used alcohol than sexually active males who were slightly

more than 8 times as likely. Lastly, sexually active males were 13 ½ times more likely to have used marijuana than sexually active females who were 10 ½ times more likely.

A series of logistic regressions were performed to determine whether a substance use disorder, including alcohol, among the parent probands was related to the co-varying relationship between the sexual behaviors and substance use of the adolescent offspring. It was hypothesized that this problem behavior syndrome would be more prevalent among the offspring of probands with a substance use disorder compared to the offspring probands without a substance use disorder. Because many of the associations with the various problem behavior syndromes were similar for proband alcohol use disorders and drug use disorders, and to maximize statistical power, these proband disorders were also combined, creating another independent variable. Therefore, these logistic regressions tested the following three independent variables: 1) an alcohol use disorder in the proband, 2) a drug use disorder in the proband, and 3) either an alcohol and/or drug use disorder in the proband.

As seen in Table 7, the offspring of probands with an alcohol use disorder who reported lifetime cigarette use were also 3 times more likely to have not used a condom compared to the children of probands without an alcohol use disorder. Among the children of probands with a drug use disorder, lifetime marijuana use among these adolescents also increased the risk for several of the sexual behaviors. Specifically, adolescents who reported lifetime marijuana use were also 2 times more likely to have ever had sexual intercourse, nearly 6 times more likely to have had sexual intercourse at or before the age of 12, 4 times more likely to have not used a condom, and approximately 4 times more likely to have engaged in at least one risky sexual behavior

compared to the offspring of probands without a drug use disorder. When combining the proband disorders to include either an alcohol and/or drug use disorder, the level of risk for these adolescent problem behaviors increased even more. Specifically, among these adolescent offspring, the risk for not using a condom was nearly 4-fold for any lifetime substance use, almost 5-fold for lifetime cigarette use, more than 3-fold for lifetime alcohol use, and more than 7-fold for lifetime marijuana use. In addition, the risk for ever having had sexual intercourse among these adolescents was 2-fold for lifetime marijuana use, and the risk for onset of sexual activity at or before age 12 was more than 3-fold for lifetime cigarette use and 6-fold for lifetime marijuana use.

In order to verify that this problem behavior syndrome was not simply the presence of conduct disorder in the adolescents, conduct disorder was added to each of the models as a covariate. As a result, all of the associations described above remained the same, suggesting that this problem behavior syndrome is not explained by the presence of conduct disorder in the adolescents.

## **Discussion**

### ***Overview of Key Findings***

Although numerous studies have confirmed the co-varying relationship between sexual behaviors and substance use among adolescents, none have examined this relation when taking into account the presence of a substance use disorder in the parents, which has been shown to be a salient risk factor for adolescent substance use. To address this issue, the goals of the present study were 2-fold. The first goal was to first establish that adolescent substance use and sexual behaviors co-occur among this sample of Puerto Rican adolescents, and clearly the study findings indicate that they do. Specifically, when comparing the rates of lifetime substance use among sexually active adolescents to those of sexually inactive adolescents, the level of risk was 9-fold for any substance use, almost 8-fold for cigarettes, nearly 8 ½-fold for alcohol, and approximately 12-fold for marijuana. These findings undoubtedly confirm that the sexually active adolescents were more likely to have used drugs than sexually inactive adolescents, with the greatest risk associated with lifetime marijuana use.

The second goal of the study was to demonstrate that the co-occurrence of these adolescent behaviors would be more likely to occur among the children of probands with a substance use disorder, including alcohol. In general, the study results indicated that a substance use disorder in the parent increased the risk for this problem behavior syndrome among the adolescent offspring. Specifically, adolescent offspring of probands with an alcohol use disorder who reported lifetime use of cigarettes were also 3 times more likely not to have used a condom compared to the children of probands without an

alcohol use disorder. Adolescent offspring of probands with a drug use disorder who reported lifetime marijuana use were also 2 times more likely to have ever had sexual intercourse, nearly 6 times more likely to have had sexual intercourse at or before the age of 12, 4 times more likely to have not used a condom, and approximately 4 times more likely to have engaged in at least one risky sexual behavior compared to the offspring of probands without a drug use disorder. When combining the proband disorders to include either an alcohol use disorder and/or drug use disorder, the risk for not using a condom was nearly 4-fold for any lifetime substance use, almost 5-fold for lifetime cigarette use, more than 3-fold for lifetime alcohol use, and more than 7-fold for lifetime marijuana use. In addition, the risk for ever having had sexual intercourse among these adolescents was 2-fold for lifetime marijuana use, and the risk for onset of sexual activity at or before age 12 was more than 3-fold for lifetime cigarette use and 6-fold for lifetime marijuana use.

### ***Extension of Prior Research***

The results of the present study support and extend the earlier work of Jessor and Jessor (1977) by testing and confirming their problem behavior theory on a cohort of Puerto Rican adolescents at high- and low-risk for substance use by virtue of the presence of a substance use disorder, including alcohol, in the probands. These findings are important because the research originally conducted by Jessor and Jessor (1977) only used a Caucasian sample of adolescents, and their study results could not be generalized to other ethnic groups. Costa et al (1995) also extended the earlier work of Jessor and Jessor (1977) by including Mexican-American adolescents in their study sample, and their findings also confirmed that early onset of sexual activity among Mexican-

American adolescents and Caucasian youth was related to delinquent behavior, problem drinking, and marijuana use. Likewise, Brook et al (1994) tested this problem behavior theory on a sample of Puerto Rican adolescents living in New York City by assessing the relationship between stage of drug use and level of sexual involvement. Similar to the results reported by both Jessor and Jessor (1977) and Costa et al (1995), Brook et al (1994) confirmed that the stage of drug use and frequency of delinquent activities were related positively to the level of sexual involvement. However, a major limitation to the research conducted by Jessor and Jessor (1977), Costa et al (1995), and Brook et al (1994) is that the role of family history and the presence of a substance use disorder in the parents were not taken into consideration. It has been well established that a substance use disorder, including alcohol, in the parents is a strong to moderate risk factor for similar disorders in the offspring compared to children of parents without a substance use disorder. Therefore, by evaluating the role of parental substance use disorders, the present study added a familial dimension to Jessor and Jessor's (1977) problem behavior theory and determined that parental substance use disorders pose substantial risk for the clustering of deviant behaviors in the adolescent offspring.

### ***Additional Findings***

Although the majority of the study's hypotheses were confirmed, we did not find that all of the adolescent sexual behaviors co-occurred with substance use. It had been hypothesized that the adolescents who had used drugs would also be more likely to have engaged in risky sexual behaviors than those adolescents who have not used drugs. As seen in Table 5, when comparing the rates of specific sexual behaviors among adolescents who have ever used drugs to those who have not, the only significant group

differences were for ever having had sexual intercourse. None of the other sexual behavior variables (e.g., *Early-Onset Sex*, *Current Sex*, *Multiple Sex Partners*, *Condom Non-Use*, and *Risky Sexual Behavior*) were significantly related to the occurrence of adolescent substance use, and did not increase the risk for such behaviors. However, as seen in Table 6, when comparing the rates of lifetime substance use among sexually active adolescents to those of sexually in-active adolescents, significant group differences were detected for all four of the drug variables (e.g., *Any Substance Use*, *Cigarette Use*, *Alcohol Use*, and *Marijuana Use*), regardless of gender. This suggests that the adolescents who have had sexual intercourse are more likely to have used drugs, but adolescents who have used drugs are not necessarily more likely to have engaged in risky sexual behaviors. These findings may be attributable to the fact that in this sample of high-risk adolescents substance use was more normative and prevalent than sexual activity.

When examining the effect of parental substance use disorders, it had been hypothesized that rates of sexual behaviors would be higher among the offspring of probands with a substance use disorder than those of probands without a substance use disorder. However, *Condom Non-Use* was the only sexual behavior variable that significantly differed according to parental disorders and this was only seen among the children of probands with an alcohol use disorder. The other sexual behavior variables (e.g., *Ever Sex*, *Current Sex*, *Early-Onset Sex*, *Multiple Sex Partners*, and *Risky Sexual Behavior*) did not differ significantly among the children of probands with an alcohol or drug use disorder as had been hypothesized. Therefore, presence of a substance use disorder in the probands did not increase the risk of the other adolescent sexual



behaviors, perhaps due to the fact that sexual behaviors among this sample of adolescents are quite prevalent for the entire sample (see Table 3). Given that the risk for risky sexual behaviors was not greater among adolescents who have used drugs, and that parental disorders did not increase the risk for such behaviors, the children at highest risk are likely to be those who are sexually active. In other words, it is the adolescents who are having sexual intercourse that are also likely to be using drugs and this risk is exacerbated by a substance use disorder in the parent.

It is important to mention that the results of this study clearly indicate that an alcohol use disorder in the parent has a different effect on the adolescent offspring than a drug use disorder in the parent. For example, as seen in Table 3, an alcohol use disorder in the proband was associated with an increased risk for condom non-use in the adolescent offspring. However, this increase in risk was not seen among the children of probands with a drug use disorder. Likewise, as seen in Table 4, a drug use disorder in the proband significantly increased the risk for adolescent substance use, with the greatest risk being associated with marijuana use. However, an alcohol use disorder in the proband did not increase the risk for adolescent substance use. These results suggest that alcohol and drug use disorders are heterogeneous, thereby posing different risk factors in their offspring. For example, substance abusers may be more deviant and may partake in riskier behaviors than alcoholics. Additionally, the level of impairment experienced by substance abusers may be greater than that among alcoholics, potentially interfering with their daily functioning and parenting abilities.

It was also important to establish a temporal sequence of events by determining which of the two behaviors occurred first. Because the Substance Use Questionnaire used

in the present study did not inquire about age of onset, this information was extracted from the DISC data, if available. When comparing the ages of onset of sexual activity to those of lifetime substance use, one-half (50.7%) of the adolescents have had sexual intercourse first. Almost one-third (28.6%) of the adolescents have used drugs first, and 20.8% began having sexual intercourse and using drugs at the same age. Although not statistically significant, the level of risk for having had sexual intercourse differed somewhat by disorders in the proband. Specifically, the offspring of probands with a drug use disorder were almost 2 times more likely ( $O.R.=1.76$ ) to have had sexual intercourse first compared to the children of probands without a drug use disorder.

It is also interesting to note that significant gender differences were detected for several of the adolescent sexual behaviors. Specifically, regardless of parental disorders, males were much more likely to have had sexual intercourse, onset at or before age 12, 3 or more sexual partners, and to have used a condom than females. These findings are similar to those reported by Warren et al (1998) who used data from the national school-based Youth Risk Behavior Survey (YRBS) for four years (1990, 1991, 1993, and 1995) in order to examine the trends and differences of sexual behaviors among high school students in the United States. Among Hispanic students, males were significantly more likely than females to be sexually active, to have had multiple sexual partners, and to have used condoms the last time they had sexual intercourse (Warren et al., 1998).

### ***Study Strengths***

Among the strengths of this study was the utilization of a high-risk study design that increases the likelihood of identifying those adolescents at high-risk for substance use and related problems, as well as adolescents at low-risk, by virtue of presence or

absence of a parental substance use disorder. High-risk studies are especially important for prevention and intervention strategies because they aid in the identification of risk factors that can help detect children at risk for particular disorders based on the presence of similar disorders in their parents. Because of the inclusion of a proband control group, the offspring of probands with a substance use disorder were compared to the offspring of probands without a disorder. Another study strength is that the sample was comprised of a cohort of Puerto Rican adolescents, a Hispanic subgroup at high-risk for substance use and risky sexual behaviors that have been associated with HIV/AIDS. In addition, diagnostic interviews were administered on both the proband and their offspring by ethnically matched interviewers. Moreover, the interviews and self-reports were available in both English and Spanish, and all of the respondents indicated their language preference. The community probands were recruited door-to-door from the same neighborhoods inhabited by those probands recruited from the clinics in order match for environmental and demographic characteristics, thereby minimizing potential biases. Lastly, the logistic regressions controlled for comorbid psychopathology in the parents, a potential confounder in the relation between parental substance use disorders and deviant behaviors in the adolescent offspring.

### ***Study Limitations***

In terms of study limitations, because many of the probands were selected to participate in the study based on a positive history of a drug use disorder, an alcohol use disorder, or the presence of a psychiatric disorder, they are not representative of the general population. Because the adolescents ranged in age from 12 to 18, many of them have not yet passed through the period of risk. For example, the presence of substance

use and sexual activity is expected to be lower among the younger adolescents, but as they grow older it is anticipated that the rates of these behaviors will increase. Had the sample size been larger, and the age range narrower, it may have been possible to detect greater significant differences regarding the association between substance use and sexual behaviors. In addition, the Substance Use Questionnaire used in this study did not inquire about age of onset of first use. As such, when available, information pertaining to age of onset of substance use was extracted from the DISC interview, administered face-to-face and not self-reported. Lastly, because the Sexual History Questionnaire was not completed by the parent probands, it was not possible to determine whether or not they have engaged in risky sexual behaviors.

### ***Conclusions***

The overall results of the present study clearly indicate that in this sample of Puerto Rican adolescents, an alcohol use disorder in the parent proband increased the risk for adolescent condom non-use, whereas a drug use disorder in the parent proband increased the risk for adolescent substance use. Moreover, sexually active adolescents were more likely to smoke cigarettes, drink alcohol, and smoke marijuana compared to sexually inactive adolescents. Lastly, the co-occurrence of certain adolescent sexual behaviors and substance use were more common among the offspring of probands with a substance use disorder compared to the children of probands without a substance use disorder. These findings are a substantial contribution to the work originally done by Jessor and Jessor (1977), Costa et al (1995), and Brook et al (1994) because it established that a substance use disorder in the parent is a risk factor for the development of this problem behavior syndrome. Additionally, these results support the vast amount of

literature on the familial aggregation of substance use disorders which have repeatedly shown that parental substance use disorders, including alcohol, are strong to moderate risk factors for the development of similar disorders in the offspring. Furthermore, when the present study added conduct disorder as a covariate to the logistic regression models the effects remained the same, suggesting that the co-occurrence of substance use and sexual behaviors is not simply conduct disorder but rather a separate phenomenon, perhaps indicative of a personality characteristic.

### ***Future Research***

Although the present study demonstrated that a substance use disorder, including alcohol, in the parent serves as an important risk factor for substance use and sexual behaviors in the adolescent offspring, it cannot be determined whether the risk is due to genetic or environmental exposures. Moreover, these findings suggest that although there are exposures that place the biological offspring at greater risk, the specific underlying mechanisms remain unclear and may include familial, genetic, biological, behavioral, environmental, and even cultural factors. Therefore, future research needs to be conducted focusing on the possible etiologic mechanisms underlying adolescent sexual behaviors and substance use as well as the co-occurrence of these behaviors as they relate to parental substance use disorders. For example, future research should examine why an alcohol use disorder in the parent proband increased the risk for condom non-use in the adolescent offspring. It can be speculated that because disproportionately more of the alcohol probands were female, it is possible that they were more reluctant to discuss sexual behaviors and condom use with their adolescent offspring, resulting in significantly higher rates of condom non-use among these adolescents. It can also be

argued that given the high rates of HIV/AIDS among intravenous drug users, parent probands with drug use disorders were more aware of the protective value of condoms. Subsequently, these probands were perhaps more likely to discuss the importance of condom use with their children, which may explain why the risk for condom non-use was not greater among these offspring. Moreover, although there is much evidence to support the findings that a drug use disorder in the parent proband increased the risk for substance use in the adolescent offspring, the underlying etiology of the co-occurrence of adolescent sexual behaviors and substance use remains elusive.

In addition to genetic influences, there are several other factors that play a role with the familial transmission of substance use disorders from parents to their offspring, and warrant future investigation. For example, parents with a substance use disorder are likely to be negative role models to their children, and their children will see drug use as a coping mechanism during times of stress and discomfort (Brook, Whiteman, Gordon, & Cohen, 1986). Moreover, maladaptive parental monitoring and negative parent-child interactions have also been shown to be potent risk factors for the development of adolescent substance use and other deviant behaviors (Brook et al., 1997; Brook, Whiteman, Balka, Win, & Gursen, 1998; Brook et al., 1986; Costa et al., 1995; Johnson, Cohen, Kasen, Smailes, & Brook, 2001). Substance-abusing parents may convey increased risk for substance use and risky sexual behaviors in offspring by means of impaired parenting. It has been demonstrated that parents with substance use disorders are less likely to provide social or emotional support to their children, resulting in poor communication, low levels of nurturing and parental bonding, and greater family conflict, all of which are associated with problem behaviors in adolescents (Brook et al., 1986;

Hawkins, Catalano, & Miller, 1992; Johnson et al., 2001). Moreover, parents with substance use disorders may be more likely to physically and/or mentally abuse their children, which will also exacerbate the risk for substance use and other deviant behaviors. Therefore, future research should evaluate the role of these risk factors as they relate to the co-occurrence of adolescent substance use and sexual behaviors in the offspring of substance abusers. It would be expected that the adolescents who have less parental monitoring, negative parent-child interactions and communication, and negative role models will be more likely to engage in substance use and sexual behaviors, and that a parental substance use disorder will increase the risk even further.

Researchers have also focused on the effects of family structure on adolescent substance use and deviant behaviors. For example, Booth et al (1990) reported that a disruptive family structure (e.g., divorce or serious injury) may interfere with parental control and family ties, thereby increasing the risk for adolescent involvement in risky behaviors including substance use (Booth et al., 1990). Similarly, using the 1984 Hispanic Health and Nutrition Examination Survey (HHANES) data on Mexican-American, Puerto Rican, and Cuban-American adolescents, Sokol-Katz and Ulbrich (1992) found that Puerto Rican adolescents reared in single-parent household engaged in more risky sexual behavior and substance use than did their peers living in two-parent households (Sokol-Katz & Ulbrich, 1992). Therefore, future research should examine family structure as it relates to the co-occurrence of substance use and sexual behaviors among Puerto Rican adolescents. Based on the existing literature on family structure, it would be expected that the risk for this problem behavior syndrome will be greater among those adolescents who lack a positive family structure, and that a parental

substance use disorder will exacerbate that risk. In the present study we were not able to demonstrate that a negative family structure served as a risk factor for this adolescent problem behavior syndrome because the rates of single-headed households among the drug (52.1%) and alcohol (50.0%) probands were actually lower than those of the normal (57.1%) probands. However, future research should examine the risk associated with a parental psychiatric disorder given the significantly higher rates of single-headed households among these probands (70.8%). Furthermore, although not assessed in the present study, future research should determine whether or not there is an interaction between family structure and parental substance use disorders. For example, based on the literature it is expected that single parents with substance use disorders may have more problems with parenting, which will increase the risk for substance use and other problem behaviors in their adolescent offspring.

With respect to this specific study, these Puerto Rican adolescents are currently being followed longitudinally which will ultimately provide additional information pertaining to the development of substance use problems as well as their sexual practices and behaviors as they grow older. The information obtained during the follow-up study will ultimately aid with the identification of additional risk factors that will contribute to the incidence of substance use disorders and other deviant behaviors among these adolescents. Future research on these families will also include comparing the rates of these disorders among Puerto Rican adolescents living in the United States to those living in Puerto Rico in order to assess the effects of migration and back-migration, which has also been shown to influence adolescent substance use and other deviant behaviors. We also plan to follow-up the findings of the present study by evaluating the possible



mechanisms underlying these problem behaviors, including the myriad of environmental, social, and cultural factors mentioned earlier. Moreover, research currently underway will extend the results of the present study to include a cohort of African-American and Caucasian adolescents who have also participated in large-scale family studies of health and behaviors.

### ***Public Health Implications***

The findings of the present study clearly indicate that Puerto Rican adolescent offspring of parents with substance use disorders are at an increased risk for substance use and risky sexual behaviors, two of the most common risk factors for HIV/AIDS. This is especially important given that the Hispanic population in the United States has grown substantially over the past twenty years, continues to grow, and represents one of the youngest segments of the population. Additionally, rates of HIV/AIDS are highest among Hispanics compared to other ethnic groups, and among Hispanic subgroups, these rates are highest among Puerto Ricans primarily due to intravenous drug use. Therefore, because Puerto Rican adolescents living in the United States are at risk for these problem behaviors, and because the risk is greatest among the offspring of parents with substance use disorders, culturally sensitive prevention and intervention strategies must target these high-risk adolescents. Because these behaviors are initiated during adolescence, and because earlier age of onset of substance use is associated with substance use disorders in adulthood, it is necessary to try to prevent these problem behaviors from occurring in the first place.

In particular, the findings of the present study support the importance of providing culturally sensitive family-based prevention and intervention programs to families of

Puerto Rican substance abusers. Research has shown that prevention programs, such as the *Strengthening Families Program (SFP)*, that focus on parent, child, and family skills can be effective and successful in their efforts to enhance protective factors and reduce risk factors of children of substance-abusing parents (Kumpfer, Molgaard, & Spoth, 1996). In these programs, substance-abusing parents learn how to develop supportive parent-child relationships, positive discipline methods, and increased levels of monitoring and supervision of their child. In addition, these programs focus on teaching these parents how to optimize and improve the levels of family communication regarding the consequences of their own substance use problems as well as their child's problems and concerns. These family-based programs work directly with the children of substance abusing parents by teaching them effective communication skills as well as how to better understand their feelings and emotions. These programs typically teach children how to cope with anger and criticism, stress management skills, problem-solving techniques, optimal social skills, and how to comply with parental rules. Additionally, these children are educated about the consequence of substance use and other problem behaviors and how to resist peer pressure concerning the use of drugs. Family activities, therapeutic child play, and family meetings are used to enhance communication skills between the parents and their children, model effective discipline techniques, reinforce positive behaviors in each other, and jointly plan family activities. These programs help to enhance the family environment by improving communication, clarifying family rules, and decreasing the level of family conflict. Such family-based programs are likely to be relevant to Puerto Ricans given that the family is such a strong source of support and identity (e.g., familism) in this ethnic group.

Although research on adolescent substance use has only recently begun to examine the various social, cultural, and specific processes involved with the etiology of substance use and other problem behaviors unique to Puerto Rican adolescents living in the United States, tremendous progress has been made and continues to be made. As a result, we are in an advantageous position where we can apply the results of this research to the development of specific prevention and intervention programs targeting Puerto Rican adolescents living in the United States, with particular focus on the offspring of substance abusing parents.

## Tables

*Table 1: Socio-Demographic Characteristics of Probands and Adolescent Offspring by Group*

PROBAND CHARACTERISTICS	PROBAND GROUP				Total N=239	P-Value
	Drug N=48	Alcohol N=32	Psych N=96	Control N=63		
Male, %	47.9 N=23	21.9 N=7	10.4 N=10	19.1 N=12	21.8 N=52	<.0001
Mean Age (SD)	37.2 (6.1)	39.4 (6.6)	39.6 (7.5)	38.0 (6.3)	38.7 (6.8)	=.1751
Clinic Recruited, %	64.6 N=31	56.3 N=18	38.5 N=37	22.2 N=14	41.8 N=100	<.0001
Single-Headed Home, %	52.1 N=25	50.0 N=16	70.8 N=68	57.1 N=36	60.7 N=145	=.0577
Mean # of Children (SD)	4.0 (2.2)	4.0 (1.4)	3.6 (1.5)	3.8 (1.5)	3.8 (1.6)	=.5684
Mean Family Size (SD)	4.4 (1.4)	4.2 (1.5)	3.9 (1.3)	4.2 (1.6)	4.1 (1.4)	=.2597
Income < \$10,000, %	41.7 N=20	34.4 N=11	52.1 N=50	47.6 N=30	46.4 N=111	=.3109
Employed, %	29.2 N=14	62.5 N=20	38.5 N=37	54.0 N=34	43.9 N=105	=.0060
< High School, %	50.0 N=24	40.6 N=13	46.9 N=45	44.4 N=28	46.0 N=110	=.8561
CHILD CHARACTERISTICS	PROBAND GROUP				Total N=371	P-Value
	Drug N=72	Alcohol N=52	Psych N=149	Control N=98		
Male, %	44.3 N=31	49.0 N=24	49.0 N=71	54.7 N=52	49.6 N=178	=.6096
Mean Age (SD)	14.3 (2.0)	14.3 (1.9)	14.3 (2.1)	14.5 (1.9)	14.4 (2.0)	=.8523
Males	14.4 (2.2)	14.2 (1.8)	14.2 (2.1)	14.3 (1.9)	14.2 (2.0)	=.9498
Females	14.2 (1.9)	14.4 (2.1)	14.5 (2.1)	14.8 (1.8)	14.5 (2.0)	=.3795

*Table 2: Psychiatric Disorders Among Probands by Group (%)*

PROBAND PSYCHIATRIC DISORDERS	PROBAND GROUP			Total N=239	P-Value
	Drug N=48	Alcohol N=32	Psych N=96		
<b>Any Affective Disorder</b>	52.1 N=25	40.6 N=13	76.0 N=73	46.4 N=111	<.0001
<b>Major Depressive Disorder</b>	33.3 N=16	28.1 N=9	71.9 N=69	39.3 N=94	<.0001
<b>Dysthymia</b>	12.5 N=6	6.3 N=2	7.4 N=7	6.3 N=15	=.0565
<b>Bipolar I or II</b>	10.4 N=5	9.4 N=3	3.1 N=3	4.6 N=11	=.0310
<b>GAD/Panic/Agoraphobia/Social Phobia/Specific Phobia</b>	54.2 N=26	25.0 N=8	54.2 N=52	36.0 N=86	<.0001
<b>Generalized Anxiety Disorder</b>	14.6 N=7	6.3 N=2	21.9 N=21	12.6 N=30	=.0004
<b>Panic Disorder</b>	14.6 N=7	9.4 N=3	10.4 N=10	8.4 N=20	=.0330
<b>Agoraphobia</b>	12.5 N=6	3.2 N=1	11.5 N=11	7.6 N=18	=.0209
<b>Social Phobia</b>	18.8 N=9	3.2 N=1	8.3 N=8	7.6 N=18	=.0021
<b>≥ 3 Specific Phobias</b>	25.0 N=12	12.9 N=4	24.0 N=23	16.4 N=39	=.0002
<b>Post Traumatic Stress Disorder</b>	37.5 N=18	21.9 N=7	27.1 N=26	21.3 N=51	<.0001
<b>Antisocial Personality Disorder</b>	31.3 N=15	9.7 N=3	6.4 N=6	10.2 N=24	<.0001

**Table 3: Sexual Behaviors Among Adolescent Offspring (%) & Odds Ratios and 95% Confidence Intervals by Proband Disorder**

ADOLESCENT SEXUAL BEHAVIORS	PROBAND GROUP								PROBAND DISORDER <sup>+</sup>			
	Drug				Alcohol				Psych			
	M	F	M	F	M	F	M	F	M	F	M	F
<b>Ever Sex</b>	44.8 13/29	24.4 10/41	50.0 13/26	30.8 8/26	32.4 23/71	31.1 23/74	38.5 20/52	19.1 8/42				
<b>Onset ≤ Age 12</b>	46.2 6/13	10.0 1/10	46.2 6/13	37.5 3/8	34.8 8/23	13.0 3/23	45.0 9/20	0.0 0/8				
<b>Onset ≤ Age 13</b>	61.5 8/13	10.0 1/10	61.5 8/13	37.5 3/8	56.5 13/23	30.4 7/23	70.0 14/20	37.5 3/8				
<b>≥ 3 Sexual Partners</b>	30.8 4/13	30.0 3/10	53.9 7/13	0.0 0/8	52.2 12/23	17.4 4/23	60.0 12/20	25.0 2/8				
<b>Sex in Last 3 Months</b>	30.8 4/13	70.0 7/10	69.2 9/13	50.0 4/8	65.2 15/23	69.6 16/23	65.0 13/20	87.5 7/8				
<b>Condom Non-Use</b>	38.5 5/13	55.6 5/9	50.0 6/12	71.4 5/7	8.7 2/23	42.9 9/21	22.2 4/18	25.0 2/8				
<b>Risky Sex<sup>1</sup></b>	76.9 10/13	80.0 8/10	76.9 10/13	75.0 6/8	73.9 17/23	52.2 12/23	80.0 16/20	50.0 4/8				
<b>Risky Sex<sup>2</sup></b>	84.6 11/13	80.0 8/10	84.6 11/13	75.0 6/8	78.3 18/23	60.9 14/23	85.0 17/20	75.0 6/8				

<sup>+</sup> Controlling for Offspring's Age, Offspring's Gender, and Proband Comorbid Psychiatric Disorders

<sup>1</sup>Risky Sex = Sex ≤ 12, ≥ 3 Partners, or Condom Non-Use

<sup>2</sup>Risky Sex = Sex ≤ 13, ≥ 3 Partners, or Condom Non-Use

\*p<.05, \*\*p<.01, \*\*\*p<.001

*Table 4: Substance Use Among Adolescent Offspring (%) & Odds Ratios and 95% Confidence Intervals by Proband Disorder*

ADOLESCENT SUBSTANCE USE	PROBAND GROUP						PROBAND DISORDER <sup>+</sup>			
	Drug		Alcohol		Psych		Control		Alcohol Use Disorder	Drug Use Disorder
	M	F	M	F	M	F	M	F	O.R.	C.I.
<b>LIFETIME</b>										
Any Use	58.1 18/31	56.1 23/41	50.0 13/26	50.0 13/26	41.1 30/73	46.1 35/76	37.0 20/54	40.9 18/44	1.1	0.7-1.9
Cigarettes	40.0 12/30	32.5 13/40	24.0 6/25	26.9 7/26	23.6 17/72	17.8 13/73	16.7 9/54	27.9 12/43	1.0	0.5-1.8
Alcohol	54.8 17/31	52.5 21/40	48.0 12/25	48.0 12/25	38.0 27/71	47.3 35/74	37.0 20/54	31.7 13/41	1.1	0.7-1.9
Marijuana	32.1 9/28	22.0 9/41	19.2 5/26	23.1 6/26	15.7 11/70	6.9 5/73	15.1 8/53	11.9 5/42	1.2	0.6-2.3
<b>PAST YEAR</b>										
Cigarettes	83.3 10/12	76.9 10/13	83.3 5/6	100.0 7/7	76.5 13/17	75.0 9/12	66.7 6/9	66.7 8/12	---	---
Alcohol	76.5 13/17	85.0 17/20	58.3 7/12	66.7 8/12	65.4 17/26	72.7 24/33	70.0 14/20	76.9 10/13	---	---
Marijuana	100.0 8/8	77.8 7/9	60.0 3/5	100.0 6/6	72.7 8/11	80.0 4/5	37.5 3/8	100.0 5/5	---	---

<sup>+</sup> Controlling for Offspring's Age, Offspring's Gender, and Proband Comorbid Psychiatric Disorders

\*p<.05, \*\*p<.01, \*\*\*p<.001

*Table 5: Odds Ratios and 95% Confidence Intervals for Sexual Behaviors Among Adolescent Lifetime Substance Users*

SEXUAL BEHAVIORS	LIFETIME SUBSTANCE USERS									
	MALES			FEMALES			TOTAL			
	Yes	No	O.R.	C.I.	Yes	No	O.R.	C.I.	Yes	No
<b>Ever Sex</b>	67.1 51/76	17.7 18/102	<b>9.5***</b>	4.7-19.1	48.3 42/87	7.3 7/96	<b>11.9***</b>	4.9-28.5	57.1 93/163	12.6 25/198
<b>Onset <math>\leq</math> Age 12</b>	39.2 20/51	50.0 9/18	0.7	0.2-1.9	14.3 6/42	14.3 1/7	1.0	0.1-9.8	28.0 26/93	40.0 10/25
<b>Onset <math>\leq</math> Age 13</b>	60.8 31/51	66.7 12/18	0.8	0.3-2.4	31.0 13/42	14.3 1/7	2.7	0.3-24.7	47.3 44/93	52.0 13/25
<b><math>\geq 3</math> Sexual Partners</b>	54.9 28/51	38.9 7/18	1.9	0.6-5.7	19.1 8/42	14.3 1/7	1.4	0.1-13.4	38.7 36/93	32.0 8/25
<b>Sex in Last 3 Months</b>	60.8 31/51	55.6 10/18	1.2	0.4-3.7	66.7 28/42	85.7 6/7	0.3	0.0-3.0	63.4 59/93	64.0 16/25
<b>Condom Non-Use</b>	29.2 14/48	16.7 3/18	2.1	0.5-8.2	41.0 16/39	83.3 5/6	0.1	0.0-1.3	34.5 30/87	33.3 8/24
<b>Risky Sex<sup>1</sup></b>	80.4 41/51	66.7 12/18	2.1	0.6-6.8	54.8 23/42	100.0 7/7	0.0	0.0-0.0	68.8 64/93	76.0 19/25
<b>Risky Sex<sup>2</sup></b>	86.3 44/51	72.2 13/18	2.4	0.7-8.9	64.3 27/42	100.0 7/7	0.0	0.0-0.0	76.3 71/93	80.0 20/25

<sup>1</sup>Risky Sex = Sex  $\leq 12$ ,  $\geq 3$  Partners, or Condom Non-Use

<sup>2</sup>Risky Sex = Sex  $\leq 13$ ,  $\geq 3$  Partners, or Condom Non-Use

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



**Table 6: Odds Ratios and 95% Confidence Intervals Lifetime Substance Use Among Sexually Active Adolescents**

LIFETIME SUBSTANCE USE	SEXUALLY ACTIVE									
	MALES			FEMALES			TOTAL			
	Yes	No	O.R.	C.I.	Yes	No	O.R.	C.I.	Yes	No
<b>Any Substance</b>	73.9 51/69	22.9 25/109	<b>9.5***</b>	4.7-19.1	85.7 42/49	33.6 45/134	<b>11.9***</b>	4.9-28.5	78.8 93/118	28.8 70/243
<b>Cigarettes</b>	47.8 33/69	7.6 8/106	<b>11.2***</b>	4.7-26.6	53.1 26/49	14.7 19/129	<b>6.5***</b>	3.1-13.8	50.0 59/118	11.5 27/235
<b>Alcohol</b>	69.6 48/69	21.7 23/106	<b>8.3***</b>	4.1-16.4	83.3 40/48	30.5 39/128	<b>11.4***</b>	4.9-26.6	75.2 88/117	26.5 62/234
<b>Marijuana</b>	40.0 26/65	4.7 5/106	<b>13.5***</b>	4.8-37.6	37.5 18/48	5.4 7/130	<b>10.5***</b>	4.0-27.5	38.9 44/113	5.1 12/236

<sup>1</sup>Risky Sex = Sex  $\leq 12$ ,  $\geq 3$  Partners, or Condom Non-Use

<sup>2</sup>Risky Sex = Sex  $\leq 13$ ,  $\geq 3$  Partners, or Condom Non-Use

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 7: Odds Ratios and 95% Confidence Intervals for Relationship Between Sexual Behaviors and Substance Use Among Adolescent Offspring by Proband Disorder<sup>+</sup>**

ADOLESCENT SEXUAL BEHAVIORS & SUBSTANCE USE		PROBAND DISORDER					
		Alcohol Use Disorder		Drug Use Disorder		Substance Use Disorder	
		O.R.	C.I.	O.R.	C.I.	O.R.	C.I.
ANY SUBSTANCE	Ever Sex	1.1	0.6-2.0	1.2	0.7-2.2	1.4	0.8-2.3
	Onset $\leq$ Age 12	1.7	0.6-4.5	1.9	0.6-5.6	2.0	0.8-5.2
	Onset $\leq$ Age 13	1.0	0.4-2.4	1.1	0.4-3.0	1.1	0.5-2.4
	$\geq 3$ Sexual Partners	0.7	0.3-1.9	0.8	2.8-2.5	0.7	0.3-1.6
	Condom Non-Use	2.4	0.9-6.5	2.3	0.8-6.4	3.7**	1.5-9.3
	Risky Sex <sup>1</sup>	1.0	0.4-2.5	2.4	0.9-6.7	1.7	0.8-3.8
	Risky Sex <sup>2</sup>	0.9	0.4-2.3	2.2	0.8-6.3	1.5	0.7-3.4
CIGARETTES	Ever Sex	1.3	0.7-2.6	1.6	0.8-3.3	1.8	1.0-3.2
	Onset $\leq$ Age 12	2.1	0.7-6.4	2.3	0.6-8.1	3.3*	1.1-10.1
	Onset $\leq$ Age 13	1.2	0.4-3.4	1.5	0.5-4.5	1.7	0.7-4.2
	$\geq 3$ Sexual Partners	0.8	0.3-2.2	0.8	0.3-2.6	0.7	0.3-1.7
	Condom Non-Use	3.0*	1.0-8.9	2.1	0.7-6.7	4.8**	1.6-14.0
	Risky Sex <sup>1</sup>	1.3	0.5-3.1	2.1	0.8-5.5	1.8	0.8-4.2
	Risky Sex <sup>2</sup>	1.1	0.5-2.8	1.9	0.7-5.0	1.6	0.7-3.6
ALCOHOL	Ever Sex	1.0	0.6-1.8	1.2	0.6-2.2	1.4	0.8-2.3
	Onset $\leq$ Age 12	1.3	0.5-3.8	1.4	0.4-4.3	1.7	0.7-4.4
	Onset $\leq$ Age 13	0.8	0.3-2.0	1.1	0.4-3.0	1.0	0.4-2.3
	$\geq 3$ Sexual Partners	0.6	0.2-1.7	0.7	0.2-2.1	0.6	0.2-1.6
	Condom Non-Use	2.0	0.7-5.5	2.5	0.9-7.1	3.3**	1.3-8.3
	Risky Sex <sup>1</sup>	0.8	0.3-2.0	2.1	0.8-5.8	1.5	0.7-3.3
	Risky Sex <sup>2</sup>	0.8	0.3-1.8	2.0	0.7-5.6	1.4	0.6-3.1
MARIJUANA	Ever Sex	1.2	0.6-2.6	2.1*	1.0-4.5	2.1*	1.1-4.0
	Onset $\leq$ Age 12	2.3	0.6-9.6	5.9*	1.1-31.8	6.0*	1.2-29.4
	Onset $\leq$ Age 13	0.8	0.2-2.8	2.7	0.7-9.9	1.6	0.5-4.8
	$\geq 3$ Sexual Partners	0.5	0.2-1.7	1.5	0.4-5.1	0.9	0.3-2.4
	Condom Non-Use	3.0	0.9-9.6	4.2*	1.1-16.2	7.1**	1.9-26.6
	Risky Sex <sup>1</sup>	1.0	0.4-2.6	3.8*	1.3-11.0	2.3	1.0-5.5
	Risky Sex <sup>2</sup>	1.0	0.4-2.6	3.8*	1.3-11.0	2.3	1.0-5.5

<sup>+</sup> Controlling for Offspring's Age, Offspring's Gender, and Proband Comorbid Psychiatric Disorders

<sup>1</sup>Risky Sex = Sex  $\leq 12$ ,  $\geq 3$  Partners, or Condom Non-Use

<sup>2</sup>Risky Sex = Sex  $\leq 13$ ,  $\geq 3$  Partners, or Condom Non-Use

\*p<.05, \*\*p<.01, \*\*\*p<.001

## Appendices

### *Appendix A:*

#### *Substance Use Scale*

Have you ever smoked cigarettes?	0 = Never Smoked 1 = Once Or Twice 2 = Occasionally 3 = Regularly
During the past 12 months, how many cigarettes did you smoke?	0 = Never Smoked 1 = Occasionally But Not Regularly 2 = One To Five Cigarettes A Day 3 = About Half A Pack A Day 4 = One Pack Or More A Day
Have you ever drank alcoholic beverages? (Beer, wine, rum, breezer, gin or other liquor)	0 = Never Drank 1 = Just A Taste 2 = One Or Two Times 3 = Occasionally 4 = Regularly
During the past 12 months, how often did you drink alcoholic beverages? (Beer, wine, rum, breezer, gin, or other liquor)	0 = Never Drank 1 = One To Three Times A Year 2 = Almost Every Month 3 = One To Three Times A Month 4 = Several Times A Week 5 = Almost Every Day
Have you ever sniffed glue or thinner?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
Have you ever smoked marijuana?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
Have you ever used heroin?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
Have you ever used cocaine or crack?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times

Have you ever used other drugs?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 12 months, how many times have you sniffed glue or thinner?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 12 months, how many times have you smoked marijuana?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 12 months, how many times have you used heroin?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 12 months, how many times have you used cocaine or crack?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 12 months, how many times have you used other drugs?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 30 days, how many times have you sniffed glue or thinner?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 30 days, how many times have you smoked marijuana?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 30 days, how many times have you used heroin?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 30 days, how many times have you used cocaine or crack?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times
During the last 30 days, how many times have you used other drugs?	0 = Never 1 = 1-3 Times 2 = 4-7 Times 3 = 8 Or More Times

Among the substances listed below, choose the single substance, if any, preferred above all others.

- 0 = Did Not Prefer Any
- 1 = Cigarettes
- 2 = Alcohol
- 3 = Glue Or Thinner
- 4 = Non-Prescribed Pills
- 5 = Heroin
- 6 = Crack Or Cocaine
- 7 = Marijuana
- 8 = Anabolic Steroids

***Appendix B:******Sexual History Questionnaire***

Have you ever had sexual intercourse?	0 = No 1 = Yes
How old were you when you had sexual intercourse for the first time?	1 = 8 Years Old Or Younger 2 = 9 Years Old 3 = 10 Years Old 4 = 11 Years Old 5 = 12 Years Old 6 = 13 Years Old 7 = 14 Years Old 8 = 15 Years Old 9 = 16 Years Old 10 = 17 Years Old Or Older
During your life, with how many people have you had sexual intercourse?	1 = 1 Person 2 = 2 People 3 = 3 People 4 = 4 People 5 = 5 People 6 = 6 Or More People
During the past 3 months, with how many different people did you have sexual intercourse?	0 = I Have Had Sex, But Not In The Past 3 Months 1 = 1 Person 2 = 2 People 3 = 3 People 4 = 4 People 5 = 5 People 6 = 6 Or More People
Did you drink alcohol or use drugs before you had sexual intercourse the last time?	0 = No 1 = Yes
The last time you had sexual intercourse, did you or your partner use a condom?	0 = No 1 = Yes

## Literature Cited

Amaro, H., Whitaker, R., Coffman, G., & Heeren, T. (1990). IX. Acculturation and Marijuana and Cocaine Use: Findings from HHANES, 1982-1984. American Journal of Public Health, 80(Supplement), 54-60.

Anthony, J. C., & Helzer, J. E. (1991). Syndromes of Drug Abuse and Dependence. In L. N. Robins & D. A. Regier (Eds.), Psychiatric Disorders in America: The Epidemiologic Catchment Area Survey (pp. 116-154). New York: The Free Press.

American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders. (Fourth Edition). Washington, D.C.: American Psychiatric Association.

Bachman, J. G., Johnston, L. D., & O'Malley, P. M. (1996). Monitoring the Future Project After Twenty-Two Years: Design and Procedures, Monitoring the Future Occasional Paper #38 (pp. 89). Ann Arbor, MI: Institute for Social Research.

Bierut, L. J., Dinwiddie, S. H., Begleiter, H., Crowe, R. R., Hesselbrock, V., Nurnberger, J. I., Porjesz, B., Schuckit, M. A., & Reich, T. (1998). Familial Transmission of Substance Dependence: Alcohol, Marijuana, Cocaine, and Habitual Smoking. Archives of General Psychiatry, 55, 982-988.

Booth, M. W., Castro, F. G., & Anglin, M. D. (1990). What Do We Know About Hispanic Substance Abuse? A Review of the Literature. In R. Glick & J. Moore (Eds.), Drugs in Hispanic Communities (pp. 21-43). New Brunswick and London: Rutgers University Press.

Bravo, M. et. al. (Under Review). Test-Retest Reliability of the Spanish Version of the Diagnostic Interview Schedule for Children (DISC-IV). Journal of Abnormal Child Psychology.

Brook, J. S., Balka, E. B., Abernathy, T., & Hamburg, B. A. (1994). Sequence of Sexual Behavior and Its Relationship to Other Problem Behaviors in African-American and Puerto Rican Adolescents. The Journal of Genetic Psychology, 155(1), 107-114.

Brook, J. S., Whiteman, M., Balka, E. B., Win, P. T., & Gursen, M. D. (1997). African-American and Puerto Rican Drug Use: A Longitudinal Study. American Academy of Child and Adolescent Psychiatry, 36(9), 1260-1268.

Brook, J. S., Whiteman, M., Balka, E. B., Win, P. T., & Gursen, M. D. (1998). Similar and Different Precursors to Drug Use and Delinquency Among African Americans and Puerto Ricans. The Journal of Genetic Psychology, 159(1), 13-29.

Brook, J. S., Whiteman, M., Gordon, A. S., & Cohen, P. (1986). Some Model Mechanisms for Explaining the Impact of Maternal and Adolescent Characteristics on Adolescent Stage of Drug Use. Developmental Psychology, 22, 460-467.

Canino, G., Bird, H., Shrout, P. E., Rubio-Stipec, M., & et. al. (1987). The Spanish Diagnostic Interview Schedule: Reliability and Concordance with Clinical Diagnoses in Puerto Rico. Archives of General Psychiatry, 44, 720-726.

Centers for Disease Control (1999). HIV/AIDS Surveillance Report, Volume 11 (No. 2). Atlanta: Centers for Disease Control and Prevention.

U.S. Bureau of the Census (1990). The Census Tract Street Locator . Washington, D.C.: U.S. Department of Commerce.

U.S. Bureau of the Census (2001). Profiles of General Demographic Characteristics: 2000 Census of Population and Housing for Connecticut . Washington, D.C.: U.S. Department of Commerce.

Cervantes, R. C., & Arroyo, W. (1994). DSM-IV: Implications for Hispanic Children and Adolescents. Hispanic Journal of Behavioral Sciences, 16(1), 8-27.

Chapa, J., & Valencia, R. R. (1993). Latino Population Growth, Demographic Characteristics, and Educational Stagnation: An Examination of Recent Trends. Hispanic Journal of Behavioral Sciences, 15(2), 165-187.

Chassin, L., Rogosch, F., & Barrera, M. (1991). Substance Use and Symptomatology Among Adolescent Children of Alcoholics. Journal of Abnormal Psychology, 100(4), 449-463.

Cohen, P., Cohen, J., Kasen, S., Velez, C. N., Hartmark, C., Johnson, J., Rojas, M., Brook, J., & Streuning, E. L. (1993). An Epidemiological Study of Disorders in Late Childhood and Adolescence: Age and Gender-Specific Prevalence. Journal of Child Psychology and Psychiatry, 34(6), 851-866.

Costa, F. M., Jessor, R., Donovan, J. E., & Fortenberry, J. D. (1995). Early Initiation of Sexual Intercourse: The Influence of Psychosocial Unconventionality. Journal of Research on Adolescence, 5(1), 93-121.

Cottler, L. B., Robins, L. N., & Helzer, J. E. (1989). The Reliability of the CIDI-SAM: A Comprehensive Substance Abuse Interview. British Journal of Addictions, 84, 801-814.

Cuadrado, M., & Lieberman, L. (1998). Traditionalism in the Prevention of Substance Misuse Among Puerto Ricans. Substance Use and Misuse, 33(14), 2737-2755.



De La Rosa, M. R., Khalsa, J. H., & Rouse, B. A. (1990). Hispanics and Illicit Drug Use: A Review of Recent Findings. The International Journal of the Addictions, 25(6), 665-691.

Farmer, A. E., Jenkins, P. L., Katz, R., & Ryder, L. (1991). Comparison of CATEGO-Derived ICD-8 and DSM-III Classifications Using the Composite International Diagnostic Interview in Severely Ill Subjects. British Journal of Psychiatry, 158, 177-182.

Farmer, A. E., Katz, R., McGuffin, P., & Bebbington, P. (1987). A Comparison Between the Present State Examination and the Composite International Diagnostic Interview. Archives of General Psychiatry, 44, 1064-1068.

Grant, B. F. (1995). Comorbidity Between DSM-IV Drug Use Disorders and Major Depression: Results of a National Survey of Adults. Journal of Substance Abuse, 7, 481-497.

Grant, B. F., & Hartford, T. C. (1995). Comorbidity Between DSM-IV Alcohol Use Disorders and Major Depression: Results of a National Drug Study. Drug and Alcohol Dependence, 39, 197-206.

Hartwell, S., Ungemack, J., Babor, T. F., Stevens, M., & Del Boca, F. (1996). State of Connecticut: Adolescent Substance Abuse Treatment Needs Assessment: The 1995 Adolescent Alcohol and Drug Use School Survey (Funded by the Center for Substance Abuse Treatment (Contract No. 270-94-0009)). Prepared for the Connecticut Department of Mental Health and Addiction Services: University of Connecticut Health Center's Alcohol Research Center.

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and Protective Factors for Alcohol and Other Drug Problems in Adolescence and Early Adulthood: Implications for Substance Abuse Prevention. Psychological Bulletin, 112, 64-105.

Helzer, J. E., Burnam, A., & McEvoy, L. T. (1991). Alcohol Abuse and Dependence. In L. N. Robins & D. A. Regier (Eds.), Psychiatric Disorders in America: The Epidemiologic Catchment Area Survey (pp. 81-115). New York: The Free Press.

Helzer, J. E., & Pryzbeck, T. R. (1988). The Co-occurrence of Alcoholism with Other Psychiatric Disorders in the General Population and its Impact on Treatment. Journal of Studies on Alcohol, 49, 219-224.

Hill, S. Y., Cloninger, C. R., & Ayre, F. R. (1977). Independent Familial Transmission of Alcoholism and Opiate Abuse. Alcoholism: Clinical and Experimental Research, 1(4), 335-342.

Hill, S. Y., & Hruska, D. R. (1992). Childhood Psychopathology in Families with Multigenerational Alcoholism. Journal of the American Academy of Child and Adolescent Psychiatry, 31(6), 1024-1030.

Hines, A. M., & Caetano, R. (1998). Alcohol and Aids-Related Sexual Behavior Among Hispanics: Acculturation and Gender Differences. AIDS Education and Prevention, 10(6), 533-547.

Hopkins, D. R. (1987). AIDS in Minority Populations in the United States. Public Health Reports, 102(6), 677-681.

Janca, A., Robins, L. N., Cottler, L. B., & Early, T. S. (1992). Clinical Observation of CIDI Assessments: An Analysis of the CIDI Field Trials - Wave II at the St. Louis Site. British Journal of Psychiatry, 160, 815-818.

Jessor, R., & Jessor, S. (1977). Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth. New York / San Francisco / London: Academic Press.

Johnson, J. G., Cohen, P., Kasen, S., Smailes, E., & Brook, J. S. (2001). Association of Maladaptive Parental Behavior With Psychiatric Disorder Among Parents and Their Offspring. Archives of General Psychiatry, 58, 453-460.

Johnson, S., Leonard, K. E., & Jacob, T. (1989). Drinking, Drinking Styles and Drug Use in Children of Alcoholics, Depressives, and Controls. Journal of Studies on Alcohol, 50(5), 427-431.

Johnston, L. D., & O'Malley, P. M. (1985). Issues of Validity and Population Coverage in Student Surveys of Drug Use. In B. A. Rouse, N. J. Kozel, & L. G. Richards (Eds.), Self-Report Methods of Estimating Drug Use: Meeting Current Challenges to Validity. NIDA Research Monograph No. 57 (ADM 85-1402). Washington, D.C.: U.S. Government Printing Office.

Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (2000). The Monitoring the Future National Results on Adolescent Drug Use: Overview of Key Findings, 1999. NIH Publication No. 00-4690. Bethesda: National Institute on Drug Abuse.

Johnston, L. D., O'Malley, P. M., Schulenberg, J., & Bachman, J. G. (1996). The Aims and Objectives of the Monitoring the Future Study and Progress Toward Fulfilling Them (2nd. Edition). Ann Arbor, MI: Institute for Social Research.

Kann, L., Kinchen, S. A., Williams, B. I., Ross, J. G., Lowry, R., Grunbaum, J. A., Kolbe, L. J., & Coordinators, S. a. L. Y. (2000). Youth Risk Behavior Surveillance - United States, 1999. Morbidity and Mortality Weekly Report, 49(No. SS-5), 1-80.

Kendler, K. S., Davis, C. G., & Kessler, R. C. (1997). The Familial Aggregation of Common Psychiatric and Substance Use Disorders in the National Comorbidity Survey: A Family History Study. British Journal of Psychiatry, 170, 541-548.

Kessler, R. C., Crum, R. M., Warner, L. A., Nelson, C. B., Schulenberg, J., & Anthony, J. C. (1997). Lifetime Co-occurrence of DSM-III-R Alcohol Abuse and Dependence with Other Psychiatric Disorders in the National Comorbidity Survey. Archives of General Psychiatry, 54, 313-321.

Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., Wittchen, H.-U., & Kendler, K. S. (1994). Lifetime and 12-Month Prevalence of DSM-III-R Psychiatric Disorders in the United States. Archives of General Psychiatry, 51, 8-19.

Khoury, E. L., Warheit, G. J., Zimmerman, R. S., Vega, W. A., & Gil, A. G. (1996). Gender and Ethnic Differences in the Prevalence of Alcohol, Cigarette, and Illicit Drug Use Over Time in a Cohort of Young Hispanic Adolescents in South Florida. Women and Health, 24(1), 21-40.

Klevens, R. M., Diaz, T., Fleming, P. L., Mays, M. A., & Frey, R. (1999). Trends in AIDS Among Hispanics in the United States, 1991-1996. American Journal of Public Health, 89(7), 1104-1106.

Kolbe, L. J. (1990). An Epidemiological Surveillance System to Monitor the Prevalence of Youth Behaviors that Most Affect Health. Health Education, 21, 44-48.

Kolbe, L. J., Kann, L., & Collins, J. L. (1993). Overview of the Youth Risk Behavior Surveillance System. Public Health Reports, 108(Suppl. 1), 2-10.

Kosten, T. R., Rounsaville, B. J., Kosten, T. A., & Merikangas, K. (1991). Gender Differences in the Specificity of Alcoholism Transmission Among the Relatives of Opioid Addicts. The Journal of Nervous and Mental Disease, 179(7), 392-400.

Kumpfer, K. L., Molgaard, V., & Spoth, R. (1996). The Strengthening Families Program for the Prevention of Delinquency and Drug Use. In R. D. Peters & R. J. McMahon (Eds.), Preventing Childhood Disorders, Substance Abuse, and Delinquency and Drug Use. Banff International Behavioral Science Series, Volume 3, pp. 241-267. Thousand Oaks, CA: Sage Publications, Inc.

Lessler, J. T., & O'Reilly, J. M. (1997). Mode of Interview and Reporting of Sensitive Issues: Design and Implementation of Audio Computer-Assisted Self-Interviewing. NIDA Research Monograph, 167, 366-382.

Lewinsohn, P. M., Hops, H., Roberts, R. E., Seeley, J. R., & Andrews, J. A. (1993). Adolescent Psychopathology: I. Prevalence and Incidence of Depression and Other

DSM-III-R Disorders in High School Students. Journal of Abnormal Psychology, 102(1), 133-144.

Locke, S. E., Kowaloff, H. B., Hoff, R. G., Safran, C., Popovsky, M. A., Cotton, D. J., Finkelstein, D. M., Page, P. L., & Slack, W. V. (1992). Computer-Based Interview for Screening Blood-Donors for Risk of HIV Transmission. Journal of the American Medical Association, 268, 1301-1305.

Lowry, R., Holtzman, D., Truman, B. I., Kann, L., Collins, J. L., & Kolbe, L. J. (1994). Substance Use and HIV-Related Sexual Behaviors Among U.S. High School Students: Are They Related? American Journal of Public Health, 84(7), 1116-1120.

Marin, B. V., & Flores, E. (1994). Acculturation, Sexual Behavior, and Alcohol Use Among Latinas. The International Journal of the Addictions, 29(9), 1101-1114.

Marin, G., & VanOss Marin, B. (1991a). Hispanics: Who Are They?, Research With Hispanic Populations (Vol. 23, pp. 1-17). Newbury Park, California, U.S.A. / London, United Kingdom / New Delhi, India: Sage Publications.

Marin, G., & VanOss Marin, B. (1991b). Issues in Identifying Hispanics, Research With Hispanic Populations (Vol. 23, pp. 18-41). Newbury Park, California, U.S.A. / London, United Kingdom / New Delhi, India: Sage Publications.

Marks, G., Cantero, P. J., & Simoni, J. M. (1998). Is Acculturation Associated with Sexual Risk Behaviors? An Investigation of HIV-Positive Latino Men and Women. AIDS Care, 10(3), 283-295.

Martin, C. S., Earleywine, M., Blackson, T. C., Vanyukov, M. M., Moss, H. B., & Tarter, R. E. (1994). Aggressivity, Inattention, Hyperactivity, and Impulsivity in Boys at High and Low Risk for Substance Use. Journal of Abnormal Child Psychology, 22(2), 177-203.

Martin, E. D., & Sher, K. (1994). Family History of Alcoholism, Alcohol Use Disorders and the Five-Factor Model of Personality. Journal of Studies on Alcohol, 55, 81-90.

Martinez, K. J. (1994). Cultural Sensitivity in Family Therapy Gone Awry. Hispanic Journal of Behavioral Sciences, 16(1), 75-89.

Merikangas, K. R., Dierker, L. C., & Szatmari, P. (1998a). Psychopathology Among Offspring of Parents With Substance Abuse and/or Anxiety Disorders: A High-Risk Study. Journal of Child Psychology and Psychiatry, 39(5), 711-720.

Merikangas, K. R., Risch, N. J., & Weissman, M. M. (1994). Comorbidity and Co-Transmission of Alcoholism, Anxiety, and Depression. Psychological Medicine, 24, 69-80.

Merikangas, K. R., Rounsaville, B. J., & Prusoff, B. A. (1992). Familial Factors in Vulnerability to Substance Abuse. In M. Glantz & R. Pickens (Eds.), Vulnerability to Drug Abuse (pp. 75-97). Washington, D.C.: American Psychological Association.

Merikangas, K. R., Stevens, D. E., Fenton, B., Stolar, M., O'Malley, S., Woods, S. W., & Risch, N. (1998b). Comorbidity and Familial Aggregation of Alcoholism and Anxiety Disorders. Psychological Medicine, 28, 773-788.

Merikangas, K. R., Stolar, M., Stevens, D. E., Goulet, J., Preisig, M. A., Fenton, B., Zhang, H., O'Malley, S. S., & Rounsaville, B. J. (1998c). Familial Transmission of Substance Use Disorders. Archives of General Psychiatry, 55, 973-979.

Miles, D. R., Stallings, M. C., Young, S. E., Hewitt, J. K., Crowley, T. J., & Fulker, D. W. (1998). A Family History and Direct Interview Study of the Familial Aggregation of Substance Abuse: The Adolescent Substance Abuse Study. Drug and Alcohol Dependence, 49, 105-114.

Mirin, S. M., Weiss, R. D., Griffin, M. L., & Michael, J. L. (1991). Psychopathology in Drug Abusers and Their Families. Comprehensive Psychiatry, 32(1), 36-51.

Montoya, I. D., Bell, D. C., Richard, A. J., Carlson, J. W., & Trevino, R. A. (1999). Estimated HIV Risk Among Hispanics in a National Sample of Drug Users. Journal of Acquired Immune Deficiency Syndrome, 21(1), 42-50.

Moss, H. B., Majumder, P. P., & Vanyukov, M. L. (1994). Familial Resemblance for Psychoactive Substance Use Disorders: Behavioral Profile of High Risk Boys. Addictive Behaviors, 19(2), 199-208.

NIDA. (1998). Drug Use Among Racial/Ethnic Minorities. Rockville: U.S. Government Printing Office.

Oetting, E. R., & Beauvais, F. (1990). Adolescent Drug Use: Findings of National and Local Surveys. Journal of Consulting and Clinical Psychology, 58(4), 385-394.

O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (1983). Reliability and Consistency in Self-Reports of Drug Use. International Journal of the Addictions, 18, 805-824.

Perez, S. M., & Salazar, D. D. L. R. (1993). Economic, Labor Force, and Social Implications of Latino Educational and Populations Trends. Hispanic Journal of Behavioral Sciences, 15(2), 188-229.

Regier, D. A., Farmer, M. E., Rae, D. S., Locke, B. Z., Keith, S. J., Judd, L. L., & Goodwin, F. K. (1990). Comorbidity of Mental Disorders With Alcohol and Other Drug Abuse: Results from the Epidemiologic Catchment Area (ECA) Study. Journal of the American Medical Association, 264, 2511-2518.

Reich, W., Earls, F., Frankel, O., & Shayka, J. J. (1993). Psychopathology in Children of Alcoholics. Journal of the American Academy of Child and Adolescent Psychiatry, 32(5), 995-1002.

Robins, L., Helzer, J., Cottler, L., & Goldring, E. (1989). NIMH Diagnostic Interview Schedule-Version III-Revised (DIS-III-R). Bethesda, MD: National Institute of Mental Health.

Robins, L. N., Helzer, J. E., Croughan, J., Williams, J. B. W., & Spitzer, R. L. (1981). NIMH Diagnostic Interview Schedule-Version III (DIS-III). Rockville, MD: National Institute of Mental Health.

Robles, R. R., Colon, H. M., Matos, T. D., Marrero, C. A., & Lopez, C. M. (1990). AIDS Risk Behavior Patterns Among Intravenous Drug Users in Puerto Rico and in the United States. Boletin - Asociacion Medica de Puerto Rico, 82(12), 523-527.

Rogler, L. H., Cooney, R. S., & Ortiz, V. (1979). Intergenerational Change in Ethnic Identity in the Puerto Rican Family. International Migration Review, 14(2), 193-214.

Rosenbaum, E., & Kandel, D. B. (1990). Early Onset of Adolescent Sexual Behavior and Drug Involvement. Journal of Marriage and the Family, 52, 783-198.

Rosenberg, P. S., & Biggar, R. J. (1998). Trends in HIV Incidence Among Young Adults in the United States. Journal of the American Medical Association, 279(23), 1894-1899.

Rounsaville, B. J., Kosten, T. R., Weissman, M. M., Prusoff, B., Pauls, D., Anton, S. F., & Merikangas, K. (1991). Psychiatric Disorders in Relatives of Probands With Opiate Addiction. Archives of General Psychiatry, 48, 33-42.

Rubio-Stipec, M., Bravo, M., & Canino, G. (1991). La Entrevista Diagnostica Internacional Compuesta (CIDI): Un Instrumento Epidemiologico Adecuado para ser Administrado Conjuntamente con Otros Sistemas Diagnosticos en Diferentes Culturas. Acta Psiquiatrica y Psicologica de America Latina, 37(3), 191-204.

Rubio-Stipec, M., Peters, L., & Gavin, A. (1999). Test Re-Test Reliability of the Computerized CIDI (CIDI Auto): Substance Abuse Modules. Substance Abuse, 20, 263-272.

SAMHSA. (2000). Summary of Findings from the 1999 National Household Survey on Drug Abuse (DHHS Pub. No. SMA). Rockville: Department of Health and Human Services.

SAS Institute, I. (1999-2000). SAS (Version 8.1). Cary, NC: SAS Institute, Inc.

Schuckit, M. A., & Smith, T. L. (1996). An 8-Year Follow-Up of 450 Sons of Alcoholic and Control Subjects. Archives of General Psychiatry, 53, 202-210.

Semler, G., Von Cranach, M., & Wittchen, H.-U. (1987). Comparison Between the Composite International Diagnostic Interview and the Present State Examination: Report to the WHO/ADHMA Task Force on Instrument Development. Geneva, Switzerland: World Health Organization.

Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., & Schwab-Stone, M. E. (2000). NIMH Diagnostic Interview Schedule for Children Version IV: Description, Differences from Previous Versions, and Reliability of Some Common Diagnoses. Journal of the American Academy of Child and Adolescent Psychiatry, 39(1), 28-38.

Sher, K. J., Walitzer, K. S., Wood, P. K., & Brent, E. E. (1991). Characteristics of Children of Alcoholics: Putative Risk Factors, Substance Use and Abuse, and Psychopathology. Journal of Abnormal Psychology, 100(4), 427-448.

Shrier, L., Emans, S. J., Woods, E. R., & DuRant, R. H. (1996). The Association of Sexual Risk Behaviors and Problem Drug Behaviors in High School Students. Journal of Adolescent Health, 20(5), 377-383.

Sokol-Katz, J. S., & Ulbrich, P. M. (1992). Family Structure and Adolescent Risk-Taking Behavior: A Comparison of Mexican, Cuban, and Puerto Rican Americans. The International Journal of the Addictions, 27(10), 1197-1209.

Spengler, P., & Wittchen, H.-U. (1989). Procedural Validity of Standardized Symptom Questions for the Assessment of Psychotic Symptoms: A Comparison of the CIDI with Two Clinical Methods. Comprehensive Psychiatry, 29, 309-322.

Swendsen, J. D., Merikangas, K. R., Canino, G. J., Kessler, R. C., Rubio-Stipec, M., & Angst, J. (1998). The Comorbidity of Alcoholism With Anxiety and Depressive Disorders in Four Geographic Communities. Comprehensive Psychiatry, 39(4), 176-184.

Szalay, L. B., Canino, G., & Vilov, S. K. (1993). Vulnerabilities and Cultural Change: Drug Use Among Puerto Rican Adolescents in the United States. The International Journal of the Addictions, 28(4), 327-354.

Turner, C. F., Ku, L., Rogers, S. M., Lindberg, L. D., Pleck, J. H., & Sonenstein, F. L. (1998). Adolescent Sexual Behavior, Drug Use, and Violence: Increasing Reporting with Computer Survey Technology. Science, 280, 867-873.

Velez, C. N., & Ungemack, J. A. (1989). Drug Use Among Puerto Rican Youth: An Exploration of Generational Status Differences. Social Science Medicine, 29(6), 779-789.

Warner, L. A., Kessler, R. C., Hughes, M., Anthony, J. C., & Nelson, C. B. (1995). Prevalence and Correlates of Drug Use and Dependence in the United States. Archives of General Psychiatry, 52, 219-229.

Warren, C. W., Santelli, J. S., Everett, S. A., Kann, L., Collins, J. L., Cassell, C., Morris, L., & Kolbe, L. J. (1998). Sexual Behavior Among U.S. High School Students, 1990-1995. Family Planning Perspectives, 30(4), 170-172 & 200.

WHO. (1989). ICD-10. Geneva, Switzerland: World Health Organization.

WHO. (1997). Composite International Diagnostic Interview (CIDI, Version 2.1). Geneva, Switzerland: World Health Organization.

Wittchen, H.-U. (1994). Reliability and Validity Studies of the WHO Composite International Diagnostic Interview (CIDI): A Critical Review. Journal of Psychiatric Research, 28, 57-84.

Wittchen, H.-U., Burke, J. D., Semler, G., & Pfister, H. (1989). Recall and Dating of Psychiatric Symptoms: Test-Retest Reliability of Time-Related Symptom Questions in a Standardized Psychiatric Interview. Archives of General Psychiatry, 46, 437-444.

Wittchen, H.-U., Robins, L. N., Cottler, L. B., Sartorius, N., Burke, J. D., Regier, D., & et. al., (1991). Cross-Cultural Feasibility, Reliability and Sources of Variance in the Composite International Diagnostic Interview (CIDI). British Journal of Psychiatry, 159, 645-653.



