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ABSTRACT

Risk and protective factor indices were developed to examine vulnerability to drug use among Latino high school students. Survey data was collected from 516 Latino 9th and 10th grade youth in the Los Angeles (California) area. Frequency and quantity of use data were collected for a range of drugs including inhalants, cocaine, and other hard drugs. Seventeen variables were examined for inclusion in a risk factor index (RFI) or protective factor index (PFI). The RFI consisted of low educational aspirations, perceived lack of opportunities, deviant acts, perceived community tolerance of drugs, perceived adult and peer drug use, perceived drug availability, and history of at least one suicide attempt. The PFI consisted of high emotional support, law abidance, religiosity, low emotional distress, self-acceptance, perceived parent and family support, perceived drug harmfulness, and negative history of sexual or physical abuse. Bivariate, multivariate, and structural equation models were used in the analyses. All of the variables except one were uniquely risk-inducing for these Latino youth. However, as a group, the PFI predicted several types of drug use for boys and girls. The epidemiological model is useful in beginning to understand the effects of multiple factors on drug use among Latino youth. (Contains 8 tables and 43 references.) (Author/SLD)

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# Risk and protective Factors for Drug Use Among Latino Boys and Girls.

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# Risk and Protective Factors for Drug Use Among Latino Boys and Girls

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Paper Presented at 1996 American Psychological Association Convention, Toronto

## ABSTRACT

We develop separate risk and protective factor indices to examine vulnerability to drug use among Latino high school students. Survey data was collected from 516 Latino 9th and 10th grade youth in the Los Angeles area. Frequency and quantity of use data were collected for a range of drugs including inhalants, cocaine, andd other hard drugs. Seventeen variables were examined for inclusion in a risk (RFI) or protective factor index (PFI). Bivariate, multivariate, and structural equation models were employed in the analysis of data. All of the variables except for one were uniquely risk-inducing for these Latino youth, however, as a group, the PFI predicted several types of drug use for boys and girls. The epidemiological model is useful in beginning to understand the effects of multiple factors on drug use among Latino youth.

## INTRODUCTION

Drug use among Latinos is a problem whose growth is in keeping with the growth of the U.S. Latino community. Young Latinos have been identified as being at higher risk for drug use than Whites, Blacks, and Asian students (Maddahian, Newcomb, & Bentler, 1988b). Johnston et al. (1995) have identified an alarming trend among Latino youth where, in eighth grade, significantly more Latino students than their peers are using nearly every kind of substance (e.g. Latino lifetime prevalence of marijuana use is 23% vs. 13% for Whites and Blacks), and, as high school seniors, Latinos have the highest usage rate for some of the most dangerous substances, cocaine, crack, and "other cocaine." When Latino male deaths are drug-related, these deaths occur earlier in the life span relative to other groups and usually involve *multiple* drugs in a drug *overdose* (SAMHSA, 1995). These trends in drug use and drug-related problems are particularly disturbing in light of the fact that the Latino population in the U.S. has increased by 53% in the last decade (Reyes & Valencia, 1993). Given these discouraging statistics, it behooves us to better understand drug use among Latino youth and obtain data that will allow us to prevent as well as treat drug use in this vulnerable population.

### Epidemiological Models of Drug Use

Recent attempts to explain and consolidate the numerous theories of drug use etiology include the epidemiological model of drug use. In this model, drug use is hypothesized to be influenced by the number of risk factors. This approach allows us to consider the multiple causal pathways, and to investigate how the number of risk factors influences future substance abuse rather than the type of risk factor to which one is exposed (Bry, McKeon, & Pandina, 1982). Bry et al. (1982) pioneered this approach and demonstrated that the simple sum of the presence of six factors was directly predictive of the level of substance use. This innovative approach has been received with enthusiasm by the field. However, a number of shortcomings were noted. First, the investigators did not distinguish between various types of drugs and, therefore, it is not clear whether there are risk factors that predict use of specific drugs as well as risk factors that predict drug use in general. Second, only six risk factors were considered and, therefore, other major sources of influence may have been omitted. Third, the risk factors cutpoints were determined empirically to maximize their association with substance use in their sample rather than basing these decisions on both theory and previous research with a variety of populations (Newcomb et al., 1986).

A significant omission in the risk factor model is the consideration of the role of protective factors. Protective factors have been defined as influences that prevent, limit, or reduce drug use and which may counter,

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buffer, neutralize, and interact with risk factors within or across time (Brook, et al., 1989a, b; Brook, Whiteman, Gordon, & Brook, 1985; Brook, Whiteman, Gordon, & Cohen, 1986; Brook, Whiteman, Gordon, Nomura, & Brook, 1986; Newcomb, 1992). Protective and risk factors have been conceptualized as representing opposite ends of the same continuum so that the absence of risk is equivalent to protection. However, we cannot assume that absence of risk is equivalent to protection. Some studies indicate that some teenage experimentation is normative and exists in the absence of risk conditions (Baumrind,1985; Kandel, 1982; Newcomb & Bentler, 1989b; Penning & Barnes, 1982; Robins & Pryzbeck, 1985). Likewise, some teenagers exposed to many high-risk factors do not abuse or even use drugs (Newcomb & Bentler, 1988a). Others have identified factors specifically associated with little or no drug use (Brook, et al., 1989a, b; Brook, Whiteman, Gordon, & Brook, 1985; Brook, Whiteman, Gordon, & Cohen, 1986; Brook, Whiteman, Gordon, Nomura, & Brook, 1986; Newcomb, 1992). It is very likely that the presence of these protective factors may account for these discrepant findings and can improve the prediction of drug use beyond that which can be explained by the presence or absence of known risk factors.

If protection is only defined as the lack of risk, it should not provide any unique, direct effect on predicting drug use independent of risk. However, recent work by Newcomb & Felix-Ortiz (1992) demonstrates that protection appears to function in a manner similar to risk and can be operationalized as a multiple factor index. These investigators found that a multiple protective factor index was associated with the frequency and quantity of alcohol use among teenagers and improved the prediction of drug use beyond that accounted for by a risk factor index alone. Protection was also found to be a construct distinct from risk and its influence on drug use had both direct and moderator effects. Substantively, the main or direct effect of protection is to predict less drug use, while the direct effect of risk is to predict increased drug involvement. The moderator or interaction effect of protection can buffer the relationship between risk and drug use as well as have a direct effect on drug use (Baron & Kenny, 1986).

In the study of a sample of mostly white adolescents, Newcomb & Felix-Ortiz (1992) found that seven psychosocial factors uniquely conferred risk: Perceived availability of drugs, perceived peer and adult use, community tolerance of drug use, deviant acts, lack of perceived future opportunities, and low educational aspirations. A different set of seven factors were strongly associated with reduced drug use: High educational achievement, law abidance, religiosity, absence of depression, self-acceptance, supportive home relationships, and perceived sanctions against drug use.

## Risk Factors for Latino Drug Use

### Gender

A dramatic gender difference in alcohol and drug use prevalence rates also distinguishes Latino drug use: women tend to abstain, and men tend to be heavy users of alcohol. Fifteen times as many Mexican American immigrant women abstain from drinking as compared to Mexican American men; four times as many island Puerto Rican women abstain from drinking as compared to island Puerto Rican men (Canino, Burnam, & Caetano, 1992). Relative to other women, most Latinas tend to abstain from alcohol use (Canino, 1994). Patterns of alcohol use vary across Latina subgroups. Mexican immigrant women are more abstemious than Puerto Rican women (44% vs 32%; Canino et al., 1992), and more abstemious than Mexican American women (Caetano, 1985). Moore (1994) has suggested a mechanism that may explain the heavy drinking among some Mexican American women. She hypothesizes that the traditional norms which discourage alcohol and other drug use among Mexican American women are also norms that label and severely stigmatize women who do not perfectly conform and, thus, can indirectly encourage drug use.

### Psychobehavioral Variables

External locus of control (Zapata & Katims, 1994), low psychosocial competence (Tommasello et al., 1993), and self-rejection/derogation (Warheit et al., 1995) are associated with Latino drug use. Poor social self-concept is another important predictor of Latino drug use (Perez et al., 1980). Emotional distress was found to be associated with drug use among Latino youth (Félix-Ortiz, Muñoz, & Newcomb, 1994; Zapata & Katims, 1994), male heavy drinkers (Caetano, 1987a; Golding, Burnam, & Wells, 1990), and veterans (Wilcox, Briones, & Suess, 1991). Expectations regarding the consequences of drug use have also been associated with Latino drug use (Marin, Marin, Perez-Stable, Sabogal, & Otero-Sabogal, 1990; Marin, Posner, & Kinyon, 1993). Educational achievement and aspirations are related to drug use among Latinos (Chavez, Oetting, & Swaim, 1994; Chavez, Edwards, & Oetting, 1989; Menon, Barrett, & Simpson, 1990; Paulson, Coombs, & Richardson, 1990; Schinke et al., 1992; Zapata & Katims, 1994). Sensation seeking (Simon, Stacy, Sussman, & Dent, 1994), deviant behavior (Zapata & Katims, 1994), certain types of assertiveness (Goldberg & Botvin, 1993), tolerance of deviance, and increased unconventionality (Velez & Ungemack, 1995) were also associated with drug use among Latinos. Health beliefs were also related to drug use in Latinos (Epstein, Botvin, Diaz, & Schinke, 1993; Rodriguez, 1995; Marin et al., 1990). Frequent church attendance and religious affiliation appear to buffer Latinas against drug use (Estrada, Rabow, & Watts, 1982). Sexual and physical assault (Berenson, San Miguel, & Wilkinson, 1992), and high threat appraisal and avoidant coping (Nyamathi, Stein, & Brecht, 1995) were associated with drug use among Latinas. Acculturation has also been identified as an important correlated of drug use, but its the direction of the relationship is not clearly understood.

Family, Peer, and Other Environmental Variables

Substance use by parents or older siblings (Barrera, Li, & Chassin, 1993; Epstein et al., 1993; Estrada et al., 1982; Gfroerer & De La Rosa, 1993) and family dysfunction or stress (Delgado, 1990; Rodriguez, 1995; Sokol-Katz & Ulbrich, 1992; Szapocznik & Kurtines, 1980; Velez & Ungemack, 1995; Zapata & Katims, 1994) are often cited as risk-inducing. Latino runaways, youth escaping or rejected by dysfunctional families, had the highest rates of drug use relative to other runaways (Koopman, Rosario, & Rotheram-Borus, 1994). In some studies, peer influence appears to be a risk factor for Latino drug use (Dusenbury, Epstein, Botvin, & Diaz, 1994; Epstein et al., 1993; Flannery, Vazsonyi, Torquati, & Fridrich, 1994; Menon et al., 1990; Rodriguez, 1995; Velez & Ungemack, 1995; Warheit et al., 1995; Zapata & Katims, 1994), but peer pressure was less influential for Latino drug use compared to national samples (Gilbert & Cervantes, 1986), and when compared to parental influences (Coombs, Paulson, & Richardson, 1991). Smoking and alcohol use is associated with socializing outside of the home (Caetano, 1987d; Marin et al., 1990), especially among men (Caetano, 1987d). Several higher level variables have been found to operate on drug use among Latinos. Poverty and availability are also correlated with Latino drug use (Delgado, 1990). Poverty was a risk factor for drug use among New York Puerto Ricans, but not island Puerto Ricans (Velez & Ungemack, 1989). Maternal education, an indicator of socioeconomic status, was related to drug use (Schinke et al., 1992). Life stressors were also related to drug use (Barrera et al., 1993; Zapata & Katims, 1994).

## The Present Study

We examine gender differences in drug use among a sample of Latino adolescents (mostly first generation Mexican American), examine how risk and protective factors influence drug use, and examine how risk and protective factors may interact to influence drug use.

## METHOD

Participants

Survey data were collected from 516 ninth and tenth grade students of Latino descent in the Los Angeles

area. Approximately 1,266 students of all ethnicities were invited to participate and over half (n=688, 54%) actually participated; of these 688, 516 were Latino. All data were collected between mid-December, 1991 and mid-February, 1992. Participation was on a voluntary basis. The questionnaire was always administered by the primary investigator and research assistants who were available during the administration to answer any questions.

Table 1 presents sample characteristics for the 516 Latino boys and Latina (female) high school students. Females were slightly overrepresented (57%) as compared to males (43%). Most of the sample was of Mexican descent (greater than 84%). Most of the sample was 15 years old (33%) or 16 years old (33%). There was no significant difference in mean age between Latino boys (mean=15.5) and Latinas (mean=15.5). The majority of the sample was first generation, that is, born in the U.S. (93%), and many were raised by parents without a high school diploma (45%). Another 44% had one parent with a high school diploma, and 11% were from families where at least one parent had a college degree. There was no significant difference between mean parental education for Latino boys and Latinas (average parental education was roughly equivalent to having one parent with a high school diploma and one parent with no high school diploma). Educational achievement differed among Latino boys and Latinas. The majority of the sample were "B" students (42%). While there was no mean difference in educational achievement (average grade was "mostly B's with some C's), there was a significant difference in the pattern of educational achievement. Latino boys were making more C's than Latinas ($X^2(3)=14.3$, $p<.05$). Over three quarters of the students aspired to some college degree (79.4%), while 20.7% did not plan to pursue formal education beyond the high school diploma. Over half (56%) aspired to a Bachelor's degree or higher. Despite a different pattern of educational achievement, the mean educational aspiration (junior college degree) was not significantly different between Latino boys and Latinas.

Measures

Substance use. We included frequency of use for five different drugs (cigarettes, alcohol, marijuana, inhalants, and other hard drugs), and quantity assessments for three substances (cigarettes, alcohol, and marijuana). More specifically, frequency of use was assessed for the past six months on seven-point anchored scales ranging from never (1) to more than once a day (7). One item captured cigarettes, three measured alcohol use (beer, wine, and hard liquor), one for marijuana, one each for crack, cocaine, and PCP, and one for other hard drugs (i.e., heroin, LSD, barbiturates, amphetamines, etc.). Reliability for the scales of alcohol use, marijuana use, and hard drug use (including cocaine) was .60 for white teens (Newcomb & Harlow, 1986). Because less than 5% had used cocaine, crack, and PCP anytime during the last six months, these three drugs were collapsed into a general measure of hard drug use. Since no major differences emerged between different types of alcohol use, these measures were also collapsed into a general frequency of alcohol use measure to simplify analyses.

The three quantity of drug use measures for cigarettes, alcohol, and marijuana use was rated on seven-point anchored scales ranging from no ingestion to heavy use. Rating categories for cigarettes smoked in one day ranged from no cigarettes (1) to more than 40 cigarettes (more than 2 packs a day) (7). The average daily amount of alcohol consumed for the last six months was reflected by the number of "bottles of beer, glasses of wine, or mixed drinks on a typical day" and ranged from none (1) to six or more (7). Amount of marijuana used was measured as the number of marijuana joints or cigarettes personally consumed in a day and ranged from none (1) to six or more (7).

Measures of protective and risk factors. Seventeen variables were selected for study as possible protective or risk factors based on theory and previous research (Bry et al., 1982; Kandel, 1980; Kaplan, 1980; Mills & Noyes, 1984; Newcomb & Bentler, 1989; Newcomb, Maddahian, & Bentler, 1986). The following were likely correlates or predictors of substance use and abuse: Educational variables (educational achievement, educational aspirations);

indicators of conventionality (religiosity, law abidance); indicators of emotional health (emotional distress, history of sexual abuse, history of physical abuse, history of suicide attempts); deviant acts; family variables (perceived parent/family support, perceived adult drug use); social milieu (perceived important people/community tolerance of drug use, perceived peer drug use, perceived availability of drugs); beliefs about self and others (self-acceptance, perceived future opportunities, perceived harmfulness of drug use).

**Educational influences** were captured in two measures. Educational achievement was measured on a seven-point Likert scale ranging from (1) straight A's to (7) mostly D's or less. Educational aspirations ranged from (1) some high school (will drop out before graduation) to (6) doctor's degree.

**Attitudes toward traditionalism and conformity** were captured by two four-item scales of law abidance and religiosity (Huba & Bentler, 1983; Newcomb & Bentler, 1988a,b; Newcomb, Huba, & Bentler, 1986). Law Abidance items tapped willingness to use a false ID, to shoplift, etc. Religiosity reflected belief in the bible, prayer, and religion. Alpha coefficients for law abidance and religiosity scales have been high (.85 and .77 respectively; Newcomb & Bentler, 1988a,b). Several new items were also be added to each scale to reflect ideas that are more likely to be endorsed by Latinos in an urban environment such as questions about gang activity and respect of clergymen.

**Deviant behavior** was represented by one scale that assessed the frequency of performing 16 criminal activities during the past year. Confirmatory factor analysis revealed four factors: Confrontational Acts (alpha=.61; four items), Theft (alpha=.67; three items), Property Damage (alpha=.41; four items), and Automobile Theft (Huba & Bentler, 1984). These items covered minor and major personal and property offenses, but excluded all types of drug crimes.

**Emotional distress** was measured by subscales of the Hopkins Symptom Checklist (HSCL; Uhlenhuth, Balter, Mellinger, Cisin, & Clinthorne, 1983). The 3 item anxiety, 3 item depression, and 3 item hostility subscales of the HSCL were used and collapsed into one score of emotional distress. The HSCL is a checklist of symptoms that has been used with a variety of samples (Stacy, Newcomb, & Bentler, 1991). Reliabilities for the subscales of anxiety and hostility are high (alpha=.81 and .78 respectively; test-retest=.79 and .81 respectively; Derogatis & Melisaratos, 1983). History of sexual abuse, physical abuse, and suicide were each measured by single items requiring a yes/no response: "Have you ever tried to commit suicide?," "Have you ever been sexually abused?," and "Have you ever been beaten severely by your parents?"

**Quality of family life** was reflected in one scale of supportive family relationships. This measure combined two four-item scales assessing relationships with parents (alpha=.82) and with family (alpha=.84; Newcomb & Bentler, 1986). These items assessed the amount of respect, support, and inclusion experienced in each of these types of relationships. "Adult(s)" was presumed a benign category through which drug-using parents could be anonymously identified by respondents. Perceived adult drug use was a composite scale based on how many adults are known to engage in 12 types of use/abuse of drugs and alcohol as rated on 5-point anchored scales from (1) none to (5) all. No alpha is available but the scale has been used often (Newcomb & Bentler, 1988a) and appears quite stable (alpha calculated using high school sample=.87).

**Perceived social milieu** regarding drug use was reflected in scales of perceived community tolerance of drug use, perceived peer drug use, and perceived availability of drug use (Stein, Newcomb, & Bentler, 1987). Peer models of drug use behavior were rated for a variety of drugs and drug use patterns. Perceived peer drug use was similar to the scale used for perceived adult drug use. It was a composite of eight items reflecting how many peers are known to engage in various types of drug involvement (Newcomb & Bentler, 1988a). No alpha is available but



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the scale has been used often (Newcomb & Bentler, 1988a) and appears quite stable (alpha calculated using high school sample=.92). Access to and ease of drug acquisition was assessed with one composite scale of availability of drugs. In this scale, six items captured how hard or easy it would be to get cigarettes, beer, wine, liquor, marijuana, and other drugs. Responses were provided on five-point anchored scales ranging from (1) very hard to (5) very easy.

**Beliefs about self and others** were measured by scales of self-acceptance, perceived future opportunities, and perceived harmfulness of drug use. Self-acceptance was measured using a four item, 5-point Likert scale (alpha=.75; Huba & Bentler, 1984; Stein, Newcomb, & Bentler, 1986). Future expectations and hopeful outlook were reflected by perceived opportunity, a scale of three items rated on five-point disagree-agree scales that assessed satisfaction with opportunities for the future, in school or work, and chances to be what you want (Newcomb, Bentler, & Collins, 1986; alpha calculated on high school sample=.53). Perceived harmfulness of seven drugs (cigarettes, inhalants, alcohol, marijuana, cocaine, crack, and PCP) was measured on a 4-point anchored Likert scales ranging from (1) not at all harmful to (4) can be deadly. The alpha calculated using the high school sample was .90.

See Appendix A for a list of measures.

## RESULTS

Prevalence Rates

Table 2 presents prevalence of drug use in the last six months for Latino boys and Latina high school students. Alcohol use was the most widely used drug. *Over half of all students had drank alcohol in some form at least once in the last six months.* Over half (54%) had drank wine, while over a third (36%) had drank liquor. Rates for liquor use were higher than expected for Latinas (40.7%;$X^2(1)=3.96$, $p<.05$). Inhalant use was the second most used drug. *About a third (31%) of these students had used inhalants at least once in the last six months. Cigarettes were the third most widely used drug (30%). Only 17% of these students had used marijuana in the last six months.* Harder illicit drugs were used least among these students with prevalence ranging from 1.0% to 7.7%. Rates for hard drug use (other than cocaine and PCP) were higher than expected among Latino boys (8.6%;$X^2(1)=3.87$, $p<.05$).

Examining rates of heavy use of substances allows us to see how many students may be at risk for substance use. Heavy use of a substance was based quantity measures that were found to be more strongly related to drug abuse than frequency measures (Stein, Newcomb, & Bentler, 1988), as well as frequency measures. The following criteria were used to define heavy quantity of use of cigarettes, alcohol, and marijuana: half a pack or more on a typical day, five or more drinks on a typical day, and two or more joints (marijuana cigarettes) a day. Heavy frequency of use was daily use or more than one time a day. Prevalence of heavy use of alcohol was highest (13.1%) followed by heavy use of marijuana (8.7%). Latino boys were over-represented as heavy users of marijuana (12.2%;$X^2(1)=5.94$, $p<.05$). *Overall, about a quarter (24.5%) of these Latino students are heavy users of addictive substances.*

Creation of the Risk and Protective Factor Indices

Since each of these 17 factors may or may not contribute unique information to predicting substance use, eight multiple regressions using all 17 scales as independent variables and each of five drug use measures as dependent variables were computed. Table 3 presents the correlations of the 17 psychosocial variables with various drug use measures. Every psychosocial variable was significantly correlated with at least one measure of drug use. Deviant acts, perceived peer drug use, and perceived adult drug use were highly correlated with all drug use measures with correlations ranging from .11 to .54. While many relationships were in the expected direction based on previous studies of these psychosocial variables, one relationship was notably different: educational achievement

was positively correlated with drug use. A multiple regression was conducted for each one of the drug use measures; each of the 17 psychosocial variables was entered. For each equation, 28% to 44% of the variance was captured by the 17 psychosocial variables. Religiosity did not predict drug use when the 17 other variables were considered. All other psychosocial variables contributed significantly to at least two types of drug use.

Since heavy drug use or abuse is infrequent, few individuals should have more than a few risk factors (Newcomb, et al., 1986). Conversely, since complete abstinence from using drugs is quite rare, few individuals should have more than a few protective factors. To reflect these expectations, the lower 20% or upper 20% of each variable distribution was designated as either protection or risk (unless it was already a dichotomous variable). In this manner, two dichotomous variables were created for each of 17 psychosocial measures: One for protection and one for risk. Although these cutoffs are theoretically based, they are also empirically driven based on subject data and previous studies (Newcomb & Felix-Ortiz, 1992; Newcomb et al., 1986; Bry et al., 1982).

All 17 risk variables and all 17 protective variables were correlated with the drug use measures. The correlations were compared in two ways to determine for each psychosocial measure whether the protection or risk variable were related most strongly to drug use. First, an average correlation (AC) across substances was computed for the risk variable and another AC for the protection variable for each measure. If the AC for protection was higher than the AC for risk, the protection form of the variable was designated a protective factor and included in the **Protective Factor Index (PFI)**. If the AC for risk was largest, the risk form of the variable was designated a risk factor and included in the **Risk Factor Index (RFI)**. To verify each assignment, the largest correlation between each pair of risk and protective variables and drug use was noted and also used as criterion for assignment. Most of the sample should have less than two risk factors or less than two protective factors. The Risk Factor Index consisted of low educational aspirations, perceived lack of opportunities, deviant acts, perceived community tolerance of drug use, perceived adult and peer drug use, perceived drug availability, and positive history of at least one suicide attempt. The Protective Factor Index consisted of high educational achievement, law abidance, religiosity, low emotional distress, self-acceptance, perceived parent/family support, perceived drug harmfulness, and negative history of sexual or physical abuse. Each index represents a sum of both interpersonal and intrapersonal factors.

Table 4 displays the cutpoints used for the creation of risk and protective ranges for each psychosocial variable. Positive history of sexual abuse, physical abuse, and suicide ranged from 9% to 19% in this sample. Cutpoints for risk ranged from 16% to 24%. Cutpoints for protection ranged from 15% to 26%. Table 5 presents the distribution of risk and protective factors by sex. Most of the sample had two or fewer risk factors (76%) and most had two or fewer protective factors (64%). Four percent of the sample had 6 or more risk factors and 3 percent of the sample had 6 or more protective factors.

Multiple Regression Analyses

Table 6 presents correlations of the RFI and PFI with drug use by gender and includes tests between correlations for Latino boys and Latinas (Fisher r-to-z conversion). Correlations of the RFI with drug use were all significant and ranged from .31 (other hard drugs) to .57 (inhalants). Correlations of the PFI with drug use were also all significant and ranged from -.12 (other hard drugs) to -.29 (frequency of alcohol use). Comparison of correlations revealed significant gender differences between the correlations for frequency of inhalant use and the RFI: the correlation was stronger for Latino boys than it was for Latinas.

Two sets of multiple regression analyses were conducted: One group tested the simultaneous main effects of the RFI and PFI and the other included an interaction effect in hierarchical steps. First, multiple regression analyses were conducted to determine the relative predictive strength of the RFI and PFI for each of the different drug use

measures. The regression coefficients for the total sample, for Latino boys, and Latinas are shown in Table 7. Across all equations, the RFI and PFI accounted for 9% to 43% of the variance. The RFI significantly predicted every type of drug use and overshadowed any significant predictive strength of the PFI for all but three types of drug use: frequency of cigarette use and alcohol use, and quantity of alcohol use among Latinas. However, in these three instances when the PFI was significant, the regression coefficient for the RFI was two to three times as large as that of the PFI.

In Table 8, we present the results of the second set of multiple regression analyses: multiple stepwise regression analyses conducted to identify any significant moderator or interaction effects between the PFI and RFI which predict drug use. To minimize collinearity problems, we standardized the risk factor and protective factor measures before creating the product (interaction) term we used these in the multiple regression analyses and in the structural equation models (Cronbach, 1987; Dunlap & Kemery, 1987). The PFI was entered first and accounted for significant variance in all equations, except for other hard drug use among boys where it was marginally significant. The RFI was entered second and accounted for significant incremental variance in every equation. The PFI x RFI interaction term was entered last and made a significant contribution in only a few equations. Among boys, the interaction term contributed significantly to frequency of cigarette use and marijuana use. Among girls, the interaction term contributed significantly to frequency of marijuana use, other hard drug use, and inhalant use; and a marginally significant contribution to quantity of alcohol use and a significant contribution to quantity of marijuana use. These interaction effects reflect partial buffering effects, i.e., that high risk and low protection reflect extremely high drug use and that low risk and high protection are associated with extremely low drug use. Protection had very little effect on drug use at high levels of risk, while risk had moderate effects on drug use at high levels of protection.

## DISCUSSION

In this sample, alcohol and inhalant use were *equally* evident across boys and girls. Heavy alcohol use was already evident among a quarter of this sample of young adolescents. The PFI was negatively associated with every kind of drug use in this sample of Latino students. However, when the PFI and RFI are considered together, in all cases the RFI was more strongly associated with drug use than the PFI and, in for most types of drug use, completely overshadowed the contribution of the PFI. The PFI remained an significant predictor for girls' alcohol and cigarette use. Additionally, the significant contribution of the interaction of risk and protection in predicting some types of drug use for both groups (e.g. frequency of marijuana use) suggests that protection moderates risk. Additional analyses and plots suggest that high risk and low protection reflect extremely high marijuana use, and that low risk and high protection are associated with low marijuana use.

In this sample of Latino teenagers, all variables examined except for religiosity were uniquely risk-inducing. This result differs from previous studies based on largely European American samples which have identified both uniquely protective as well as risk-inducing factors (Newcomb & Felix-Ortiz, 1992). Although White American teens are "protected" (i.e. less likely to use drugs) by educational achievement, these Latino teens were not. Furthermore, absence of a risk factor, such as emotional distress, was weakly associated with low drug use or abstinence. This suggests that the risk factors identified in this study may be especially salient for Latinos. Because protective factors as a group may be negatively associated with drug use, factors were assigned based on indices used previously (Newcomb & Felix-Ortiz, 1992). The assignments were also theoretical based. Attachment to conventional order, opportunities, one's sense of skillfulness, and perceived rewards are identified as important factors that diminish risk for delinquent behavior (Hawkins, et al., 1986; Hawkins & Weis, 1985).

In conclusion, the epidemiological model provides a useful framework for understanding the myriad factors

that influence drug use among Latino youth. These results also imply new directions for further research, clinical work, and prevention programming for Latino youth. First, it may be useful to replicate this type of study with longitudinal data, greater numbers representing various Latino subgroups, and data that is based in a more emic approach, one that begins with qualitative studies of Latino populations and proceeds to test more culturally sensitive variables that may influence drug use. It may also be useful to further explore the relationships between the RFI, PFI, and drug use using more powerful statistical methods such as structural equation models. Second, inhalant use suggests an additional need to screen for neurologiccal effects due to the neurotoxicity of even a single use of inhalants. Finally, it appears important to intervene with Latino youth early in their lives since, by their early teens, some Latino youth are already heavily involved in alcohol use and that new programs must be designed to appeal to and address issues that may be important to young Latinas as well as young Latinos.

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Table 1
Sample Characteristics of Latino and Latina High School Students

| Variable | Total n | Total % | Male n | Male % | Female n | Female % | Test Statistic |
|---|---|---|---|---|---|---|---|
| Total | 516 | 100.0 | 221 | 43.0 | 295 | 57.0 | |
| Age | | | | | | | |
| 14 or less | 88 | 17.1 | 37 | 16.7 | 51 | 17.3 | |
| 15 | 172 | 33.3 | 70 | 31.7 | 102 | 34.6 | $X^2$ (3) = 1.4 |
| 16 | 168 | 32.6 | 78 | 35.3 | 90 | 30.5 | t (470)= 0.2 |
| 17 or older | 88 | 17.1 | 36 | 16.3 | 52 | 17.6 | |
| Mean | | | 15.5 | | 15.5 | | |
| Educational Achievement | | | | | | | |
| Mostly A's | 79 | 15.4 | 28 | 22.7 | 51 | 17.3 | |
| Mostly B's | 217 | 42.0 | 87 | 39.4 | 130 | 43.0 | $X^2$ (3) =14.3* |
| Mostly C's | 118 | 22.9 | 68 | 30.8 | 50 | 16.9 | t (493)= 1.1 |
| Some C's or less | 102 | 19.7 | 38 | 17.2 | 64 | 21.7 | |
| Mean | | | 4.2[a] | | 4.1 | | |
| Educational Aspirations | | | | | | | |
| Dip. | 104 | 20.2 | 43 | 19.5 | 61 | 20.7 | |
| Associate's | 120 | 23.3 | 54 | 24.5 | 66 | 22.4 | $X^2$ (3) = 1.1 |
| Bachelor's | 156 | 30.2 | 70 | 31.7 | 86 | 29.2 | t (480)=-1.0 |
| Graduate degree | 136 | 26.3 | 54 | 24.4 | 82 | 27.8 | |
| Mean | | | 4.3[b] | | 4.4 | | |
| Parent's Education | | | | | | | |
| No Dip./ No Dip. | 234 | 45.3 | 100 | 45.2 | 134 | 45.4 | |
| Dip./ No Dip. | 114 | 22.1 | 48 | 21.7 | 66 | 22.4 | |
| Dip./Dip. | 112 | 21.7 | 54 | 24.4 | 58 | 26.2 | $X^2$ (5) = 5.5 t (498)=-0.3 |
| Degree/ No Dip. | 17 | 3.3 | 6 | 2.7 | 11 | 5.0 | |
| Degree/Dip. | 19 | 3.7 | 7 | 3.2 | 12 | 5.4 | |
| Degree/ Degree | 20 | 3.9 | 6 | 2.7 | 14 | 6.3 | |
| Mean | | | 2.0[c] | | 1.9 | | |

*$p<.05$; degrees of freedom are indicated in parentheses; No Dip./No Dip.=neither parent has a high school diploma; Dip./No Dip.=one parent has a diploma, the other does not; Dip./Dip.=both parents have high school diplomas; Degree/No Dip.=one parent has a college degree, one does not have a high school diploma; Degree/Dip.=one parent has a college degree, one has a high school diploma; Degree/Degree=both parents have college degrees.
[a]roughly equivalent to "mostly B's with C's"
[b]roughly equivalent to "junior college degree"
[c]roughly equivalent to "Dip./No Dip."

Table 2

Prevalence of Various Types of Drug Use Over the Last Six Month Among Latino and Latina High School Students

| Variable | Males n | Males % | Females n | Females % | $X^2$ |
|---|---|---|---|---|---|
| Cigarettes | 62 | 28 | 92 | 31 | |
| Alcohol | 131 | 59 | 161 | 56 | |
| Beer | 18 | 8 | 19 | 6 | |
| Wine | 127 | 58 | 146 | 50 | $p \leq .10$ |
| Liquor | 71 | 32 | 120 | 41 | $p \leq .05$ |
| Marijuana | 42 | 19 | 45 | 15 | |
| Cocaine | 9 | 4 | 11 | 4 | |
| Crack | 5 | 2 | 3 | 1 | |
| PCP | 6 | 3 | 4 | 1 | |
| Inhalants | 64 | 29 | 98 | 33 | |
| Other Hard Drugs | 17 | 8 | 11 | 4 | $p \leq .05$ |
| Heavy Use of: | | | | | |
| Cigarettes | 3 | 1 | 4 | 1 | |
| Alcohol | 32 | 15 | 33 | 11 | |
| Marijuana | 7 | 3 | 3 | 1 | $p \leq .10$ |

Multiple Regression Analyses for Factors Contributing to Drug Use Among Latino and Latina High School Students

| | Frequency of Drug Use Measures | | | | | Quantity Measures | | |
|---|---|---|---|---|---|---|---|---|
| Variables | Cig. | Alc. | Mj. | Inha. | H.D. | Cig. | Alc. | Mj. |
| Educational Achievement | .10 ** | .05 + | | .05 + | | | .08 * | .05 + |
| Educational Aspirations | | | | | | | | -.07 * |
| Religiosity | | | | | | | | |
| Law Abidance | -.15 *** | -.07 * | | | .11 * | -.11 * | -.12 ** | |
| Deviant Acts | .15 *** | .31 *** | .33 *** | .36 *** | .47 *** | .35 *** | .16 *** | .35 *** |
| Emotional Distress | .07 * | | .05 + | | .09 * | | | |
| Sexual Abuse | -.07 * | | | | | -.09 * | | |
| Physical Abuse | .07 * | -.05 + | | -.06 * | | | | |
| Suicide Attempt | .23 *** | .17 *** | .13 *** | .19 *** | .06 + | .24 *** | .11 ** | .07 * |
| Parent/Family Support | | .07 + | | | | | | |
| Perceived Adult Drug Use | .10 * | | .11 ** | | | | .15 *** | .15 *** |
| Perceived Tolerance of Drug Use | .06 + | .06 + | .06 * | .07 * | -.10 ** | .08 * | | |
| Perceived Peer Drug Use | | .16 *** | .12 ** | .12 ** | .10 * | | .13 ** | .11 * |
| Availabity of Drugs | .09 * | .12 *** | .05 + | .11 ** | | | .12 ** | .06 + |
| Self-Acceptance | | | .11 * | | | | | |
| Perceived Future Opportunities | | -.10 * | | -.07 * | | | | |
| Perceived Harmfulness | | -.12 *** | -.13 *** | -.09 ** | -.13 *** | | | -.07 * |
| $R^2$ | .29 *** | .44 *** | .42 *** | .44 *** | .28 *** | .32 *** | .35 *** | .39 *** |

+p≤.10, *p≤.05, **p≤.01, ***p≤.001

Table 4

Cutpoints for Risk and Protective Factors

| Psychosocial Variable | Variable Range | Cutpoint | Percent of Sample |
|---|---|---|---|
| **Risk Factor Index** | | | |
| Low Educational Aspirations | 1- 7 | ≥ 6 | 19.5 |
| Deviant Acts | 0-71 | ≥ 6 | 21.5 |
| History of Suicide Attempt | 0- 1 | = 1 | 18.8 |
| Perceived Adult Drug Use | 7-34 | ≥15 | 20.5 |
| Perceived Important People/ Community Tolerance of Drug Use | 10-50 | ≥24 | 20.5 |
| Perceived Peer Drug Use | 9-45 | ≥18 | 20.2 |
| Perceived Drug Availability | 10-50 | ≥40 | 20.8 |
| Lack of Perceived Opportunity | 3-15 | < 9 | 15.7 |
| **Protective Factor Index** | | | |
| High Educational Achievement | 1- 7 | ≤ 2 | 15.3 |
| Religiosity | 6-30 | ≥25 | 18.7 |
| Law Abidance | 7-30 | ≥27 | 18.9 |
| Low Emotional Distress | 9-44 | ≤17 | 20.5 |
| History of Physical and/or Sexual Abuse | 0- 2 | = 0 | 90.0 |
| Perceived Parent/Family Support | 9-40 | ≥36 | 15.1 |
| Self-Acceptance | 4-20 | ≥19 | 18.0 |
| Perceived Harmfulness | 7-28 | ≥27 | 26.4 |

Table 5

Sample Distribution for Risk and Protective Factor Indices

| Risk Factor Index | | | | Protective Factor Index | | | |
|---|---|---|---|---|---|---|---|
| | Percent of Sample | | | | Percent of Sample | | |
| Number | Total | Male | Female | Number | Total | Male | Female |
| 0 | 31.8 | 32.6 | 31.2 | 0 | 7.8 | 3.6 | 10.8 |
| 1 | 25.0 | 25.8 | 24.4 | 1 | 29.1 | 33.0 | 26.1 |
| 2 | 19.0 | 16.3 | 21.0 | 2 | 27.1 | 28.5 | 26.1 |
| 3 | 9.1 | 8.6 | 9.5 | 3 | 19.0 | 19.0 | 19.0 |
| 4 | 6.8 | 8.1 | 5.8 | 4 | 9.7 | 9.0 | 10.2 |
| 5 | 4.1 | 4.5 | 3.7 | 5 | 4.5 | 4.5 | 4.4 |
| 6 | 3.3 | 3.6 | 3.1 | 6 | 2.1 | 1.8 | 2.4 |
| 7 | 1.0 | 0.5 | 1.4 | 7 | 0.8 | 0.5 | 1.0 |
| 8 | 0 | 0 | 0 | 8 | 0 | 0 | 0 |

Table 6

Correlations of Risk Factor Index and Protective Factor Index with Measures of Drug Use Among Latino and Latina High School Students

| Variable | Total | Males | Females | Z-Diff |
|---|---|---|---|---|
| **Risk Factor Index** | | | | |
| Frequency of Use Over the Last Six Months | | | | |
| Cigarettes | .44 | .49 | .41 | 1.12 |
| Alcohol | .56 | .59 | .53 | 0.98 |
| Marijuana | .54 | .56 | .53 | 0.48 |
| Inhalants | .57 | .65 | .49 | 2.67** |
| Other Hard Drugs | .31 | .34 | .34 | 0 |
| Quantity of Use | | | | |
| Cigarettes | .44 | .49 | .39 | 1.39 |
| Alcohol | .51 | .57 | .46 | 1.68 |
| Marijuana | .51 | .57 | .48 | 1.39 |
| **Protective Factor Index** | | | | |
| Frequency of Use Over the Last Six Months | | | | |
| Cigarettes | -.25 | -.21 | -.27 | 0.71 |
| Alcohol | -.29 | -.27 | -.31 | 0.49 |
| Marijuana | -.24 | -.23 | -.25 | 0.24 |
| Inhalants | -.26 | -.24 | -.28 | 0.48 |
| Other Hard Drugs | -.12 | -.11 | -.18 | 0.80 |
| Quantity of Use | | | | |
| Cigarettes | -.19 | -.17 | -.19 | 0.23 |
| Alcohol | -.29 | -.20 | -.35 | 1.82 |
| Marijuana | -.20 | -.18 | -.25 | 0.82 |

Note: all correlations were significant
+$p \leq .10$; *$p \leq .05$; **$p \leq .01$

Table 7

Multiple Regression Analyses of the RFI and PFI for Measures of Drug Use Among Latino and Latina High School Students

| Variable | Beta Weights RFI | Beta Weights PFI | $R^2$ |
|---|---|---|---|
| **Frequency of Use Over the Last Six Months** | | | |
| Total Sample | | | |
| Cigarettes | .40*** | -.11** | .20*** |
| Alcohol | .52*** | -.08* | .32*** |
| Marijuana | .53*** | -.03 | .29*** |
| Inhalants | .54*** | -.05 | .32*** |
| Other Hard Drugs | .31*** | .00 | .09*** |
| Males | | | |
| Cigarettes | .48*** | -.04 | .24*** |
| Alcohol | .57*** | -.07 | .35*** |
| Marijuana | .55*** | -.03 | .32*** |
| Inhalants | .65*** | -.01 | .43*** |
| Other Hard Drugs | .34*** | .01 | .11*** |
| Females | | | |
| Cigarettes | .34*** | -.15** | .18*** |
| Alcohol | .49*** | -.11* | .30*** |
| Marijuana | .51*** | -.05 | .29*** |
| Inhalants | .45*** | -.10+ | .25*** |
| Other Hard Drugs | .32*** | -.04 | .11*** |
| **Quantity of Use** | | | |
| Total Sample | | | |
| Cigarettes | .42*** | -.03 | .19*** |
| Alcohol | .47*** | -.10** | .27*** |
| Marijuana | .51*** | .00 | .26*** |
| Males | | | |
| Cigarettes | .49*** | -.01 | .24*** |
| Alcohol | .57*** | .00 | .33*** |
| Marijuana | .58*** | .04 | .32*** |
| Females | | | |
| Cigarettes | .37*** | -.06 | .16*** |
| Alcohol | .38*** | -.20*** | .24*** |
| Marijuana | .45*** | -.07 | .24*** |

Note: The significance of R-squared is based on F-value. The significance of beta weights is based on the t-value.
+p≤.10; *p≤.05; **p≤.01 ***p≤.001

Table 3

Multiple Stepwise Regression Analyses of Indices and their Interaction on the Measures of Drug Use

| Variables | Total Sample | | Males | | Females | |
|---|---|---|---|---|---|---|
| | Incremental $R^2$ | $R^2$ | Incremental $R^2$ | $R^2$ | Incremental $R^2$ | $R^2$ |
| **Frequency of Use Over the Last Six Months** | | | | | | |
| Cigarettes | | | | | | |
| PFI | .069*** | .069*** | .046*** | .046*** | .084*** | .084*** |
| RFI | .133*** | .202*** | .198*** | .244*** | .098*** | .182*** |
| RxP | .004* | .206*** | .027*** | .271*** | 0 | .182*** |
| Alcohol | | | | | | |
| PFI | .085*** | .085*** | .072*** | .072*** | .100*** | .100*** |
| RFI | .232*** | .317*** | .279*** | .351*** | .195*** | .295*** |
| RxP | 0 | .317*** | .003 | .354*** | 0 | .295*** |
| Marijuana | | | | | | |
| PFI | .057*** | .057*** | .051*** | .051*** | .068*** | .068*** |
| RFI | .237*** | .294*** | .266*** | .317*** | .218*** | .286*** |
| RxP | .019*** | .313*** | .020*** | .337*** | .030*** | .316*** |
| Inhalants | | | | | | |
| PFI | .071*** | .071*** | .057*** | .057*** | .085*** | .085*** |
| RFI | .251*** | .322*** | .369*** | .426*** | .165*** | .250*** |
| RxP | .008*** | .330*** | .006+ | .432*** | .015* | .265*** |
| Other Hard Drugs | | | | | | |
| PFI | .015** | .015** | .013+ | .013+ | .030*** | .030*** |
| RFI | .079*** | .094*** | .099*** | .112*** | .085*** | .115*** |
| RxP | .002 | .096*** | .001 | .113*** | .024*** | .139*** |
| **Quantity of Use** | | | | | | |
| Cigarettes | | | | | | |
| PFI | .040*** | .040*** | .033** | .033** | .045*** | .045*** |
| RFI | .150*** | .190*** | .207*** | .240*** | .111*** | .156*** |
| RxP | .002 | .192*** | .004 | .244*** | .003 | .159*** |
| Alcohol | | | | | | |
| PFI | .083*** | .083*** | .041*** | .041*** | .126*** | .126*** |
| RFI | .186*** | .269*** | .285*** | .326*** | .117*** | .243*** |
| RxP | .001 | .270*** | .003 | .329*** | .006+ | .249*** |
| Marijuana | | | | | | |
| PFI | .042*** | .042*** | .030** | .030** | .069*** | .069*** |
| RFI | .220*** | .262*** | .292*** | .322*** | .166*** | .237*** |
| RxP | .007*** | .269*** | .002 | .324*** | .033*** | .270*** |

+p≤.10 *p≤.05 **p≤.01 ***p≤.005

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