

# **Risk and Protective Factors for Drug Use Among Polydrug-Using Urban Youth and Young Adults**

**Gary J. Burkholder**  
Walden University

**Jean J. Schensul**  
Institute for Community Research

**Raul Pino**  
Institute for Community Research

The purpose of the study was to examine the influence of traditional risk and protective factors for drug use on six different popular drugs on a population that is primarily Black and Latino between the ages of 16 and 24. Multiple regression analysis was used to test the relative importance of risk and protective indexes, and their interaction, in predicting drug use. Findings suggested: (a) traditional risk and protective factors, as well as situationally-specific factors such as gang involvement, predicted drug use; and (b) the relative contribution of risk and protective factors toward explained variances differs substantially among the drug outcomes. Thus, risk and protective factors may be operating differently for different drugs, indicating that more research is needed into the meanings associated with the use of particular drugs and the factors that may make youth vulnerable to some drugs but not others.

**Keywords:** risk factors; protective factors; multiethnic; polydrug use; urban youth

Drug use and other risky behaviors are now recognized to be the result of multiple factors based on an ecological approach that considers risk and resiliency factors at multiple levels as determinants of vulnerability to drug-use initiation or problem drug use (Dryfoos, 1991; Hawkins, Catalano, & Miller, 1992; Hawkins, Lishner, & Catalano,

---

Address correspondence to Dr. Gary Burkholder Walden University, 155 Fifth Avenue South, Suite 100, Minneapolis, MN 55401. Email: [gary.burkholder@waldenu.edu](mailto:gary.burkholder@waldenu.edu). This research was carried out at the Institute for Community Research, 2 Hartford Square West, Suite 100, Hartford, CT, 06106-5128. The project was funded by a grant from the National Institute for Drug Abuse (NIDA Grant # R01 DA11421). We would like to thank Helena de Moura Castro for her invaluable assistance with final manuscript formatting and preparation.

1985; Scheier, Newcomb, & Skager, 1994). Despite its importance, the vulnerability model has fallen short of explaining alcohol and drug use progression for youth who are largely out of school, already involved in significant drug use, potentially exposed to serious crime and violence, and having ties to drug networks. There are thus significant gaps in the literature, especially with respect to specific situated predictors of risk behaviors in low income older urban youth and young adults. These gaps include the effect of involvement in drug dealing or exposure to violence as well as the impact of the use of specific drugs and drug combinations. In this paper, we address these limitations in several ways. First we investigate vulnerability to drug use among an urban, primarily Black/African-American and Hispanic/Latino, polydrug-using population of youth between the ages of 16 and 24. Second, we hypothesize that the impact of risk factors and protective factors may vary by specific drugs used as well as by multiple drug use. Thus, we present analyses that examine differential predictors of six different drugs popular among urban youth, as well as the predictors of polydrug use. Third, our analyses are based on a definition of vulnerability that includes the interaction of risk and protective factors, rather than emphasizing each domain separately. In this respect, a primary goal of the study was to apply the methodology of Newcomb and Felix-Ortiz (1992) in creating risk and protective indexes to describe the role each plays (as well as the interaction of the two) in predicting drug use in a primarily Black/African-American and Puerto Rican sample.

### **Vulnerability: A History**

#### ***Risk and Protective Factors***

In the early 1990s, two reviews of the literature summarized what was then known about risk and protective factors. Clayton's (1992) review defined *risk factors* as "an individual attribute, individual characteristic, situational condition, or environmental context that increases the probability of drug use or abuse or a transition in level of involvement with drugs" (p. 15). He defined *protective factors* as factors that "inhibit, reduce, or buffer the probability of drug use or abuse or transition in level of involvement with drugs" (p. 16). Clayton summarized and synthesized previous seminal studies in which risk factors for drug use were identified (including Bry, McKeon, & Pandina, 1982; Labouvie, Pandina, White, & Johnson, 1986; Newcomb, Maddahian, & Bentler, 1986, cited in Clayton, 1992). Hawkins et al. (1992) expanded this synthesis in an extensive review of the literature and summarized the known and theorized risk and protective factors involved with drug use.

#### ***Vulnerability***

Hawkins et al. (1992) defined vulnerability as "intensified susceptibility to risk" (p. 86). Theoretically, protective factors moderated the effect of risk factors to reduce the risk for subsequent substance use. Though Hawkins et al. acknowledged the existence of protective factors, their work emphasized reduction of risk factors rather than enhancement of protective factors or the interaction of both. In a study of changing drug use patterns, Newcomb and Felix-Ortiz (1992) followed adolescent boys and girls into adulthood. They advanced the Hawkins et al. framework by operationalizing the concept of vulnerability as a latent factor that combined risk and protective factors as well as the risk\*protective interaction. The Newcomb and Felix-Ortiz study is one of the first to

statistically distinguish risk from protective factors and to demonstrate empirically that protective factors moderate risk factors.

### ***Empirical Studies***

Since these seminal studies, research has demonstrated broad support for risk and protective factors as predictors of substance use and other risk behaviors. Support for risk factors is evidenced in studies showing associations between drug use and family disorganization (e.g., Abdelrahman, Rodriguez, Ryan, French, & Weinbaum, 1998; Biafora & Zimmerman, 1998; Felix-Ortiz & Newcomb, 1992; Hanlon, Bateman, Simon, O'Grady, & Carswell, 2002; Kingery, McCoy-Simandle, & Clayton, 1997) and between perceived peer use and positive peer norms (e.g., Abdelrahman et al., 1998; Biafora & Zimmerman, 1998; Engels & ter Bogt, 2001; Farrell & White, 1998; Felix-Ortiz & Newcomb, 1992; Lynskey, Fergusson, & Horwood, 1998; Vega, Gil, & Wagner, 1998). Some studies also support the influence of protective factors on drug use outcomes, for example, the association of lower or no drug use with positive parental influence (e.g., Crosnoe, Erickson, & Dornbusch, 2002; Farrell & White, 1998; Velez & Ungemack, 1995; Wills, Vaccaro, & McNamara, 1992).

Despite these advances, there is still a limited amount of research examining the interaction of risk and protective factors in multi-ethnic and/or low-income populations or with older youth. Studies on adolescents in these groups have yielded mixed results. For example, Biafora & Zimmerman (1998), in a comparison of African-American and White non-Hispanic middle-school students on family environment, school, peer, mental health, social perception, and deviance variables, found differential risk by ethnicity. In some cases, African-Americans were found to be at higher risk (e.g., not being from a two-parent family, low parent education, lack of involvement with peers); in others, White non-Hispanics were more at risk (e.g., as evidenced by such factors as older siblings' substance use, and peer cigarette use). Gottfredson and Koper (1996) found more similarities than differences by ethnicity (e.g., White, compared to non-White participants, reported reduced drug use associated with positive peer influences, stronger commitment to school, and less rebellious behavior).

The majority of studies on risk and protective factors involve middle and high school students. In the area of vulnerability, older youth and young adult populations appear to be significantly under researched. The growing recognition of a new developmental stage marking the prolongation of emergence into adulthood suggests the importance of focusing vulnerability studies on this age group (Arnett & Taber, 1994).

These research gaps have important implications for the mental and social health of youth and young adults. One specific example of where this gap is most noticeable pertains to polydrug use, defined as the simultaneous or sequential use of multiple drugs (e.g., see Schensul, Convey, & Burkholder, 2005). Transition to problem drug use among drug-using youth and young adults often includes an expanded drug repertoire, which, in turn, is predictive of continued future problem behaviors. There are few studies on vulnerability to polydrug use, especially among older youth and young adults, (e.g., see Boys & Marsden, 2003; Byqvist, 1999; Collins, Ellickson, & Bell, 1998; Lenton, Boys, & Norcross, 1997; Martin, Arria, Mezzich, & Bukstein, 1993; more recently, Schensul & Burkholder, 2005).

The purpose of this paper is to add to the existing literature on drug use vulnerability in several ways. Our focus on those aged 16 to 24 years will extend what we

know about vulnerability to polydrug use in adolescents to an older and under-researched group of polydrug using youth and young adults. This population is vulnerable to multiple risks including drug use, social and physical violence, and the stresses associated with lack of economic opportunity and acculturation. Second, analyses will consider differences in the role risk and protective factors play in the use of several drugs popular among people in this age group. Additionally, the sample includes urban youth and young adults who identify as primarily Black/African American or Puerto Rican. Analyses based on self-identified ethnic affiliation will add to the limited information on ethnic patterns in vulnerability to drug use for this age group. This paper also extends previous work by Schensul and Burkholder (2005) by replicating the Newcomb and Felix-Ortiz (1992) methodology for examining vulnerability variables in terms of risk and protective factors as well as the interaction of the two. The focus on this paper, then, is the aggregate impact of risk factor and protective factor scores rather than contributions of the individual predictors on drug use that includes multiple individual drugs as well as simultaneous (polydrug) use.

## Method

### *Participants*

Participants were recruited as part of the *Pathways to High Risk Drug Use among Urban Youth* (NIDA Grant # R01 DA11421) research project. The study was conducted during the period 1999–2002 in low-income neighborhoods of a poor mid-sized city of approximately 130,000 in the northeastern United States. Participants ( $N = 401$ ) were primarily Black/African American and Puerto Rican young adults between the ages of 16 and 24. For our study, the population of interest was polydrug-using youth and young adults. Eligibility criteria for enrollment in the study were: (a) to be between 16 and 24 years of age (b) Hartford residency (for initial seeds) (c) the use of alcohol *or* any form of marijuana *and* one other drug, (d) non-habitual (less than 15 days a month) users of non-injected cocaine or heroin in any form; and (e) exclusion of those injecting any drug. Participants were recruited into the study by community researchers using a targeted sampling plan. Targeted sampling plans have been demonstrated to yield representative samples in hard to reach populations (Singer & Weeks, 1992; Watters & Biernacki, 1989).

### *Procedure*

Researchers ethnically matched to the larger community and familiar with the urban environment contacted “seeds.” These participants were recruited from city neighborhoods designated as high-risk as defined by high rates of violence, crime, prostitution, and low income and served as recruiters for other participants. Eligibility criteria included 30-day use of alcohol or marijuana and at least one other noninjected drug. Participants scheduled an interview at the Institute for Community Research, and a field interviewer completed eligibility criteria screening and informed consent procedures. Field interviewers read the instrument to participants and recorded their answers to questions. This was done because of the complexity of some aspects of the instrument, including the detailed drug use matrix. After completion of the baseline survey that included a number of questions concerning school and work background, family history, past and present drug use, criminal history, violence exposure, and sexual activity, the participant was asked to refer for potential participation other peer members

of their personal networks. The specific criteria for participation were not revealed to the seed in order to minimize bias in the network sample. Participants were paid a small amount (\$5.00) for each eligible peer who subsequently completed an interview. The instrument, recruitment protocols and consent forms were reviewed and approved by the Institutional Review Board of the Institute for Community Research each year during the course of the study.

### **Measures**

Using an ecological framework following Hawkins et al. (1992) and Newcomb and Felix Ortiz (1992), we selected twenty-one risk and protective variables for inclusion in the study based on previous research, theory and ethnographic data on the target population. Below we provide a brief description of predictors and dependent variable measures used. For multi-item scales, the mean of all non-missing items (a common approach when the amount of missing data is very small) was calculated to form the overall score. Assignment of variables as risk or protective will be described in the results section. Items for scales were created by the researchers and / or adapted from existing measures. Given the uniqueness of the population, items were created that matched the realities of the world of these urban, polydrug-using youth. Once the scales were created, they were extensively reviewed by field interviewers as well as youth who fit the criteria for the study. Test-retest reliability was completed for the instrument, and those data are available upon request.

**Individual-Level Predictors.** Individual level predictors included: (a) *Optimism* ( $\alpha = .51$ ), a six item scale that assessed positive and negative expectations about one's life; (b) *Religiosity* ( $r = .73$ ), a single item, "How important is religion in your life today?"; (c) *Employment Status* ( $r = .30$ ), a single-item predictor; (d) *Family Atmosphere* ( $\alpha = .62$ ), a six-item scale in which the participant rated his or her household atmosphere when growing up; (e) *Perceived Access to Substances* ( $\alpha = .77$ ), a five-item scale asking the participant to assess how easy it would be to obtain marijuana, dust/"illy," heroin, cocaine/crack and pills if he or she wanted to; (f) *Attitudes Toward Substance Use* ( $\alpha = .67$ ), a six item scale assessing the extent to which the participant holds favorable attitudes toward use of a number of substances, including cigarettes, alcohol, marijuana, cocaine, and heroin; (g) *Perceived Usefulness of Risky Behaviors* ( $\alpha = .82$ ), a 13-item scale in which the participant rated his or her perception of the usefulness of engaging in a number of behaviors considered risky (for example, one item was, "Carrying a gun"; another item was, "Walking alone at night"); (h) *Perceived Risk* ( $\alpha = .82$ ), a 13-item scale in which the participant rated his or her perception of the risk associated with same items as indicated in (g) above; (i) *Risk Behaviors During the Last Year of School* ( $\alpha = .62$ ), a four item scale in which the participant rated his or her engagement in a variety of risky behaviors during the last year of school (e.g., one item was, "In the last year you were in school, how often did you use alcohol before coming to school?"); (j) *Social Health Consequences Index*, a sum of 11 indicators (Yes-No) of involvement in activities that impact on social health. Examples of these activities include past and current drug dealing, past and present involvement in gangs, past and present carrying of a weapon, and involvement in the criminal justice system; (k) *School Achievement* ( $r = .94$ ), a single question asking the participant to report his or her grades in school; (l) *School Attachment* ( $r = .83$ ), which was assessed with two items (whether or not the participant ever dropped out of school and the number of times he or she was

expelled from school); (m) *Mental Health Status*, was assessed using two separate items (diagnosis of depression ( $r = .66$ ) or Attention Deficit Hyperactivity Disorder (ADHD;  $r = .55$ ); and (n) *Self Harm* ( $r = .78$ ), a single item that asked whether or not the participant ever tried to hurt him or herself.

*Peer and Family Influence Predictors* included: (a) *Perceived School Peer Substance Use* ( $\alpha = .65$ ), a five item scale asking participants to estimate the number of peers in their school who were using a variety of substances; (b) *Perceived Friend's Substance Use* ( $\alpha = .59$ ), a five item scale that asked the participant to estimate the number of friends who were using the same substances as in (b) above; (c) *Peer Attitudes Toward Drug Use* ( $\alpha = .70$ ), a six item scale in which the participant rated how peers felt about drug use and drug selling; (d) *Pressure to Avoid Drugs* ( $\alpha = .80$ ), a six item scale on how much pressure the participant gets from friends and family to avoid using cigarettes, alcohol, marijuana, heroin/cocaine, hallucinogens; (e) *Pressure to Use Drugs* ( $\alpha = .71$ ) is a six item scale concerning the amount of pressure the participant gets from friends and family to use different drugs; (f) *Parental Substance Use*, assessed from four items for which the participant was asked the number of parents and grandparents who used these substances; and (g) *Gang Membership* ( $r = .92$ ), using a single item, "Have you ever been a member of a gang or tagging crew?"

**Dependent variables.** The dependent measures consisted of the number of days of use of 6 separate drugs during the past 30 days as well as the number of drugs used in the past 30 days (polydrug use). These operationalizations of the drug use and polydrug use variables are typical in the literature. The study survey used a matrix format to ask a series of questions about 19 different kinds of drugs. From these drugs, we created 6 categories of drug use that represented the majority of use by our sample of urban youth and young adults. These drugs were (a) alcohol; (b) marijuana (including "regular" or high-potency ("bud") marijuana); (c) dust, a drug of growing popularity which is a combination of either mint or marijuana leaves and embalming fluid and believed to contain PCP (D'Onofrio, Degutis, Mascia, & MacCausland, 2001; Holland, Nelson, Ravikumar, & Elwood, 1998; Modesto-Lowe, 2002); (d) Marijuana with hard additives (including heroin and cocaine); (e) Heroin or cocaine used by itself; and (f) MDMA ("ecstasy"), a recreational drug that is growing in popularity among urban youth (Cohen, 1998; Curran & Travill, 1997; Schensul, 2001).

### **Hypothesis**

The main hypothesis for the study is that aggregate scores for risk factors and for protective factors, and the interaction between the two, will predict drug use (alcohol, marijuana, dust, marijuana with hard additives, heroin or cocaine, and ecstasy) as well as polydrug use when controlling for age, ethnicity, and gender.

### **Statistical analyses**

All statistical analyses were performed using SPSS V11.0. The analyses were performed in stages and followed the procedure outlined by Newcomb and Felix-Ortiz (1992). All predictor variables correlated with at least one of the dependent drug use variables were retained for further analysis. These variables were then dichotomized into a risk and protective component by taking the upper or lower twenty percent (approximate) of the distribution of each variable. For example, from the variable *Optimism*, two variables were created. The first represented those participants who reported optimism scores in the top 20% of the distribution, and this was defined as

protective optimism (the variable was coded as 1 = in the top 20%; all other participants were assigned a score of 0). Similarly, for those participants who reported optimism scores in the lower 20% of the distribution optimism was coded as a risk factor (risk optimism; the variable was coded as 1 = in the lower 20% and 0 = not in the lower 20% of the distribution). When this procedure was completed, each of the 23 variables was associated with two recoded variables – one related to a risk component and one related to a protective component.

Next, each variable pair was correlated with the seven drug use outcomes. The correlation for each risk and protective variable with the outcomes was computed, and the average correlation across the seven outcomes was computed. If the correlation for the risk component was larger in magnitude than the protective component, the variable was defined as a risk factor, and if the magnitude of the average protective correlation was larger, the variable was defined as protective. In this way, each of the variables was assigned as risk or protective. For variables that were dichotomous (i.e., Yes-No response), previous theory was used to decide how the variable should be assigned. Finally, the number of risk factors and protective factors for each individual were summed to create a risk index and protective index.

The main analytic procedure consisted of multiple regression analyses in which gender, age, and ethnicity were entered into all models as covariates. The sample size was slightly less than the total number of study participants, since only Black/African-American and Hispanic/Latino (primarily Puerto Rican) respondents were included in the analyses. These two groups accounted for 88% of the total sample of 401, a distribution roughly representative of the population demographics in the urban Hartford area. The risk index, protective index, and the risk\*protective vulnerability score were included in the models to examine the relative predictive power of each of these predictors. Separate regression models were run for the seven drug use outcomes.

## Results

The characteristics of the sample (overall, as well as for Black/African American and Latino participants) are presented in Table 1. Consistent with the theoretical and recruitment goals of the overall project, the sample was polydrug-using and ethnically diverse. Of note were differences in 30-day drug use by ethnicity. Hispanic/Latino participants were more likely to report using ecstasy and hard drugs (sniffed heroin or cocaine). Black/African American participants were more likely to report higher use of “dust.”

Table 2 provides the correlations for each risk and protective candidate variables and the seven drug use outcomes. The results indicated that each variable was significantly correlated with at least one of the seven drug outcomes; thus, all variables were used to create the risk and protective factors indices.

**Table 1**  
**Demographic Characteristics of the Overall Sample and of Black/African-American and Hispanic/Latino Participants**

Characteristic	( <i>n</i> = 401)	( <i>n</i> = 152)	( <i>n</i> = 214)	<i>p</i>
Mean Age ( <i>SD</i> )	19 (2)	19	19	.79
Not employed/looking for work (%)	68	69	71	.10
Mean income (\$)	500-599	500-599	500-599	.91
Completed High School or more (%)	28	38	27	.03
Currently attending school (%)	33	40	27	.006
# different drugs ever used <i>M (SD)</i>	6.3 (2)	5.7 (1.9)	6.7 (2.3)	.000
# different drugs used last 30 days <i>M (SD)</i>	4.8 (1.7)	4.5 (1.4)	5.0 (1.7)	.007
# days alcohol used in the last 30 days	9.6 (9.6)	9.8 (10)	9.7 (9.8)	.93
# days marijuana used in the last 30 days <sup>1</sup>	35.1 (17)	37.0 (18)	34.0 (16)	.08
# days dust used in the last 30 days	7.1 (11)	8.11 (11)	6.5 (11)	.01
# days marijuana with hard additives used in the last 30 days	0.9 (3.7)	1.0 (4.0)	1.0 (4.0)	.17
# days heroin or cocaine used in the last 30 days	1.3 (5.8)	1.0 (5.6)	1.7 (5.2)	.00
# days ecstasy used in the last 30 days	1.4 (3.8)	0.3 (1.2)	2.2 (5.0)	.00

*Note:* <sup>1</sup>Marijuana use is greater than thirty days due to the way this composite was formed. We asked about two kinds of marijuana – high-grade THC marijuana (“bud”) and regular marijuana. To get the marijuana dependent variable, the number of days for each were summed together to provide the maximum variance for the two kinds of marijuana.

**Table 2**  
**Correlations Between Candidate Risk and Protective Variables and the Seven Drug Use Outcomes**

Predictors	Polydrug	Alcohol	Marijuana	Dust	Marijuana w/ Additives/	Heroin Cocaine	Ecstasy
<i>Individual level predictors</i>							
Optimism	-.13**				-.18***	-.21***	
Religiosity		-.15**					
Employment	-.18***				-.19***	-.18***	
Family Atmos	-.12*	-.23***			-.16*	-.13**	-.10*
Access	+.25***	+.16***	+.19***	+.18***		+.11*	+.21***
Self Attitudes	+.36***	+.23***	+.13**		+.28***	+.18***	+.22***
Usefulness	+.36***	+.26***	+.16***		+.30***	+.24***	+.20***
Perceived Risk	+.13**				-.11*		-.10*
School Risk	+.34***	+.32***	+.11*	+.14**	+.19***	+.15**	+.23***
Social Health	+.35***	+.18***	+.29***	+.23***	+.13**	+.16***	+.14**
School Grades					+.11*	+.18*	
SchDropout	+.14**	+.16***				+.11*	
SchExpelled	+.18***	+.13**					+.22***
Depression		+.12*					
ADHD	+.10*		+.10*				+.18***
Self Harm	+.16***	+.10*				+.22***	+.12*
SchPeer Use	+.14**	+.10*	+.12*	+.14*			+.12*
Friend Use	+.37***	+.25***			+.23***	+.35***	+.20***
Peer Attitude	+.18***				+.24***	+.25***	+.14**
Avd Pressure					+.10*		-.13*
Use Pressure	+.21***	+.13*			+.18***	+.17***	
Parent Use				+.12*			
Gang	+.20***		+.15**		+.12*	+.12*	+.10*

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

Scale name abbreviations: Optimism = Optimism; Religiosity = Religiosity; Employment = Part-time or full-time employment status; Family Atmos = Family Atmosphere; Access = Perceived Access to Substances; Self Attitudes = Attitudes Toward Substance Use; Usefulness = Perceived Usefulness of Risky Behaviors; Perceived Risk = Perceived Risk; School Risk = Risk Behaviors During Last Year of School; Social Health = Social Health Consequences Index; School Grades = School Achievement; SchDropout and SchExpelled = School Attachment; Depression and ADHD = Mental Health Status; Self-Harm = Self-Harm; SchPeer Use = Perceived School Peer Use; Friend Use = Perceived Friend's Substance Use; Peer Attitude = Peer Attitude Toward Drug Use; Avd Pressure = Pressure to Avoid Drug

Use; Use Pressure = Pressure to Use Drugs; Parent Use = Parental Substance Use; Gang = Gang Membership.

The following variables were assigned as risk factors, based on statistical analyses: (1) Low Optimism; (2) Higher School Peer Use; (3) More Pressure to Use Substances; (4) More Friend Use of Substances; (5) Higher Perceived Access to Substances; (6) Higher Perceived Usefulness of Risky Behaviors; (7) Favorable Peer Attitudes Toward Substance Use; (8) Favorable Personal Attitudes Toward Substance Use; (9) More Parental Use; (10) Higher Social Health Index score; and (11) Higher reported School Risk.

The following variables were assigned as protective factors: (1) High Religiosity; (2) Positive Family Atmosphere; (3) Being Employed; (4) Higher School Grades; (5) No history of School Dropout; (6) No history of School Expulsion; (7) No history of Depression; (8) No history of ADHD; (9) More Pressure to Avoid Substance Use; (10) Higher Perceived Risk associated with risky behaviors; (11) No Gang Membership; and (12) No History of Self-Harm. A descriptive analysis indicated that the mean number of risk factors was 2.5 ( $SD = 2.0$ ) with a range from 0 to 9. The mean number of protective factors for the sample was 5.6 ( $SD = 1.9$ ), with a range from 0 to 11. Thus, the participants tended to report more protective than risk factors. There were no statistically significant differences by ethnicity on number of risk factors. However, Latino participants reported statistically fewer ( $M = 5.2$ ) protective factors than Black participants ( $M = 6.2$ ). Similar analyses indicated no statistical differences between males and females on the number of risk and protective factors.

Table 3 provides the results of multiple regression models that included age, sex, and ethnicity as covariates, the risk and protective indices as main effects, and the risk\*protective interaction. Reported are standardized parameter estimates, probability value for the estimates, and explained variance ( $R^2$ ) for each of the drug use outcomes. The results show that vulnerability measures are important predictors in all of the models and are presented below.

**Table 3**  
**Results for Multiple Regression Models Including Age, Sex, and Ethnicity as Covariates, the Risk and Protective Indices as Main Effects, the Risk\*Protective Interaction Term, and the Seven Drug Outcomes as Dependent Variables**

Independent Variables	Polydrug		Alcohol		Marijuana		Dust		Marijuana w/ Additives		Heroin/ Cocaine		Ecstasy	
	$\beta^1$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>
Age	.03	.57	<b>.13*</b>	.01	-.04	.48	-.07	.19	.03	.53	<b>.19*</b>	.00	.01	.85
Gender	<b>-.12*</b>	.01	-.02	.70	.01	.93	-.01	.79	-.07	.18	-.07	.17	.01	.85
Ethnicity	.05	.36	-.08	.11	<b>-.15*</b>	.01	<b>-.15*</b>	.006	.01	.78	<b>.13*</b>	.01	<b>.28*</b>	.00
Risk	<b>.37*</b>	.00	<b>.23*</b>	.00	.08	.17	.07	.24	<b>.37*</b>	.00	<b>.28*</b>	.00	<b>.22*</b>	.00
Protective	<b>-.20*</b>	.00	<b>-.21*</b>	.00	<b>-.19*</b>	.001	-.04	.54	-.08	.12	-.07	.20	-.06	.28
Risk*Prot	<b>-.10*</b>	.04	-.03	.50	.09	.10	<b>.11*</b>	.04	<b>-.18*</b>	.00	.07	.14	-.02	.75
R <sup>2</sup>	.24		.13		.05		.03		.17		.17		.14	

Note: <sup>1</sup> Standardized parameter estimate (beta)

\* Statistically significant to at least  $p < .05$ .

***Polydrug use.*** The overall model, which explained 24% of the variance in the polydrug use outcome, indicates that males were more likely to report higher polydrug use; there were no differences by age or ethnicity. The risk\*protective interaction demonstrated a significant, negative relationship with the outcome suggesting that protective factors do not moderate the relationship between risk factors and polydrug use to the same degree as under the presence of fewer risk factors. The main effects of risk and protective factors were also significant, with more risk factors associated with a higher number of drugs used in the previous 30 days and more protective factors associated with fewer drugs used.

***Alcohol use.*** The model, which explained 13% of the variance in the alcohol use outcome, indicates that older people were more likely to consume alcohol more frequently in the previous 30 days. For this model, the risk\*protective interaction was not significant. However, more risk factors, and fewer protective factors, were associated with higher frequency of alcohol use.

***Marijuana use.*** This model, which explains only 5% of the variance in the marijuana use outcome, indicates that ethnicity is an important predictor of frequency of use. Being Black/African American was associated with more frequent marijuana use. In this model, more protective factors were associated with less frequent use. The risk and risk\*protective interaction were not statistically significant.

***Dust use.*** In this model, which explains only 3% of the variance in the dust use outcome, dust use is associated with being Black/African American. The risk\*protective interaction was significant, and the association was positive. This again suggests the impact of protective factors as a moderating influence on use.

***Marijuana with added heroin or cocaine use.*** This model, which explains 17% of the variance in use of this combination of drugs, indicates that the risk\*protective interaction is highly significant. The pattern here is similar to that for 30-day polydrug use in that those reporting few protective factors tended to report more 30-day use of marijuana with hard additives as the number of risk factors increased. This suggests that, for this substance, protective factors are not a particularly effective moderator of use. Additionally, the main effect of risk factors was significant, and more risk factors were associated with higher 30-day use.

***Heroin/Cocaine use.*** In this model, which accounted for 17% of the variance in the drug use outcome, age and ethnicity were both statistically related to frequency of cocaine and heroin use. Older participants were more likely to report more frequent use, and Hispanic/Latino participants were more likely than Black/African American participants to report more frequent use. The main effect of risk factors was positively associated with the outcome, suggesting that the presence of more risk factors is associated with more frequent drug use.

***Ecstasy use.*** In this model, independent variables accounted for 14% of the variance in frequency of ecstasy use. More frequent use was associated with being Hispanic/Latino, and more risk factors were associated with more frequent use of ecstasy. The protective factors index and the risk\*protective interaction were not statistically significant.

## **Discussion**

The present study investigated the influence of a number of risk and protective factors on the use of six separate drugs commonly used by urban youth. The results suggest that risk and protective factors that have been examined in previous literature with school-age youth and adolescents are also important correlates of drug use and polydrug use among older youth.

A number of conclusions can be drawn from these analyses. Early studies focused primarily on the use of single substances including tobacco, alcohol, marijuana and, perhaps, cocaine with school-age populations. The results of this study, however, suggest that polydrug use is a risk outcome important in and of itself. This is consistent with findings by other polydrug researchers (e.g., Boys & Marsden, 2003; Byqvist, 1999; Collins et al., 1998; Schensul et al., 2003). Understanding the correlates of polydrug use could have intervention implications for those who work with urban, poor and marginalized youth.

We did find some ethnic differences in prediction of drug use. The results are consistent with ethnographic analyses suggesting that Black/African-American youth were more likely to use marijuana and “dust” more frequently, while Hispanic/Latino youth were more likely to use cocaine/heroin and ecstasy. Based on a review of other studies, we believe that ours is one of the first to document such differences. Ethnic-specific use of certain drugs may be the result of multiple factors including supply, acculturation, and ethnic or age-specific boundaries between “acceptable” and “unacceptable” drugs.

Some researchers highlight acculturation as a major contributor to drug exposure and use. Acculturation factors include employment status, proficiency in English, access to educational services, and intergenerational conflict (e.g., Reid, Aitken, Beyer, & Crofts, 2001; Scheier et al., 1997; Szalay, Canino, & Vilov, 1993; Vega, Gil, & Wagner, 1998; Velez & Ungemack, 1989, 1995; Warheit & Gil, 1998). Depending on how it is defined, acculturation can be viewed as learning new coping strategies to reduce risks encountered in the new environment, or as incurring acculturation stress related to social and economic marginalization, prejudice and stigma, and family dysfunction that may be associated with higher levels of drug use. Further investigation of variations in patterns of drug use in the context of acculturation and structural strain (Brunswick, 1999; Newcomb et al., 2002) is greatly needed.

Our results also showed that risk and protective factors differentially predict use. For example, a comparison of the explained variance across all the models shows that risk and protective factors explain more of the variance for polydrug use and ecstasy. However, the same variables predict only 5% of the variance in dust use and 3% of the variance in marijuana use. It could be that these drugs have different meanings (i.e. that they are not viewed as “addictive” or are not considered to be “problems” in the same way that alcohol and hard drugs are perceived to be, or are used socially in friendship networks [c.f. Schensul et al., 2000]). This suggests that more research is needed to examine the social meanings of different drugs for urban youth and young adults, and the social and other situations in which they are used. The results also suggest further more complex analyses such as SEM, where all drugs are included, which would allow for all outcomes to be simultaneously modeled (in effect, use of one drug would be controlled for by the presence of other drugs in the model).

The fact that so little of the variance in drug use is explained in these models (the maximum was 24% for polydrug use) suggests that there is much that researchers still do not understand about vulnerability to drug use especially with respect to this population of older urban youth and young adults. Felix-Ortiz and Newcomb (1992) reported explained variance values ranging from .10 for tobacco to .51 for cannabis; Lynskey, Fergusson, & Horwood (1998), in a study of early adolescents (to age 16), reported a model in which vulnerability explained approximately 54% of the variance in drug use). The differences noted between these example studies and our own suggest that more research on risk and protective factors for older, polydrug using economically marginalized and minority youth and young adults is very much needed. Studies that incorporate concepts such as acculturation and structural strain, as well as

the influence of social capital factors, might add other factors that explain more of the variance in drug use outcomes in this population.

We recognize some limitations with the present study. We chose to replicate the procedure that Newcomb and Felix-Ortiz used for assigning variables risk or protective status. This procedure has extensive support in the literature; these factors, for the most part, have enjoyed theoretical as well as empirical support as vulnerability markers. However, assignment can be done in other ways. For example, Stouthamer-Loeber et al. (2002) suggested a procedure of trichotomizing variables and then comparing high and low groups to the middle group to determine whether a variable was risk or protective. One feature of this method is that a variable can act as both risk and protective for different individuals. However, in an analysis that compared both methods, we found that the differences in explained variance resulting in each procedure were minor or non-existent (Burkholder, Schensul, & Pino, 2003). Regardless, both of these methods assume that risk and protective factors can be assigned based on statistical procedures alone. We suggest that more research is required to identify those factors that become established over time as protective for this group of youth and young adults so that the decision is based on theoretical and empirical rather than statistical rationales. Another limitation is that the sample is not random. However, the targeted sampling plan commonly used in other studies of drug users to identify hidden populations provides more confidence that the sample is representative of this population of older youth and young adult, urban, and polydrug users. Finally, some of the internal consistency reliability (alpha) scores are lower than desired (.70). While this may introduce error and impact power, we feel the findings are still important; future researchers might devise instruments that would demonstrate higher internal consistency.

Despite these limitations, the present research contributes to our understanding of vulnerability for drug use in several important ways. First, we have established the importance of studying risk and protective factors in an understudied population of older, urban, polydrug-using and ethnically diverse youth and young adults. Second, the drug specific analyses suggest that risk and protective factors may be operating differently for different drugs, indicating that more research is needed into the meanings associated with the use of particular drugs and the factors that may make youth vulnerable to some drugs but not others. Third, the overall low explained variance suggests the need to improve measures of vulnerability for this group and to explore other hypotheses associated with drug use that, combined with vulnerability, improve the explained variance. The vulnerability hypothesis stresses early prevention to avoid later problems. We do not disagree with the need to emphasize early prevention. However, our analyses suggest the importance of continued research on drug use exploring more contemporary influences on specific as well as polydrug use, and the development of prevention strategies targeted toward older, multiethnic urban, economically, politically, and socially disadvantaged youth who use multiple drugs for multiple reasons.

## References

- Abdelrahman, A. I., Rodriguez, G., Ryan, J. A., French, J. E., & Weinbaum, D. (1998). The epidemiology of substance use among middle school students: The impact of school, familial, community and individual risk factors. *Journal of Child & Adolescent Substance Abuse*, 8(1), 55-75.
- Arnett, J. J., & Taber, S. (1994). Adolescence terminable and interminable: When does adolescence end? *Journal of Youth and Adolescence*, 23(5), 517-537.

- Biafora, F., & Zimmerman, R. (1998). Developmental patterns of African American adolescent drug use. In W. A. Vega & A. G. Gil (Eds.), *Drug use and ethnicity in early adolescence* (pp. 149-175). New York, NY: Plenum.
- Boys, A., & Marsden, J. (2003). Perceived functions predict intensity of use and problems in young polysubstance users. *Addiction, 98*(7), 951-963.
- Brunswick, A. F. (1999). Structural strain: An ecological paradigm for studying African American drug use. *Drugs & Society, 14*(1-2), 5-19.
- Bry, B. H., McKeon, P., & Pandina, R. J. (1982). Extent of drug use as a function of number of risk factors. *Journal of Abnormal Psychology, 91*(4), 273-279.
- Burkholder, G. J., Schensul, J. J., & Pino, R. (2003, August). *A comparison of methods assessing vulnerability to drug use*. Paper presented at the 111th annual convention of the American Psychological Association, Toronto, Ontario, Canada.
- Byqvist, S. (1999). Polydrug misuse patterns in Sweden. Gender differences. *Substance Use & Misuse, 34*(2), 195-216.
- Clayton, R. R. (1992). Transitions in drug use: Risk and protective factors. In M. D. Glantz & R. W. Pickens (Eds.), *Vulnerability to drug abuse* (pp. 15-51). New York, NY: Plenum.
- Cohen, R. (1998). *The Love Drug: Marching to the Bea of Ecstasy*. New York, NY: Haworth Press.
- Collins, R. L., Ellickson, P. L., & Bell, R. M. (1998). Simultaneous polydrug use among teens: Prevalence and predictors. *Journal of Substance Abuse, 10*(3), 233-253.
- Crosnoe, R., Erickson, K. G., & Dornbusch, S. M. (2002). Protective functions of family relationships and school factors on the deviant behavior of adolescent boys and girls: Reducing the impact of risky friendships. *Youth & Society, 33*(4), 515-544.
- Curran, H., & Travill, R. A. (1997). Mood and cognitive effects of +- 3,4-methylenedioxymethamphetamine (MDMA, "ecstasy"): Week-end "high" followed by mid-week low. *Addiction, 92*(7), 821-831.
- D'Onofrio, G., Degutis, L., Mascia, R., & MacCausland, J. (2001). Illy: Clinical implications of an emerging street drug. *Substance Abuse, 22*(2), 130-131.
- Donovan, J. E., & Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology, 53*(6), 890-904.
- Dryfoos, J. G. (1991). *Adolescents at Risk: Prevalence and Prevention*. New York, NY: Oxford University Press.
- Engels, R. C., & ter Bogt, T. (2001). Influences of risk behaviors on the quality of peer relations in adolescence. *Journal of Youth & Adolescence, 30*(6), 675-695.
- Farrell, A. D., & White, K. S. (1998). Peer influences and drug use among urban adolescents: Family structure and parent-adolescent relationship as protective factors. *Journal of Consulting & Clinical Psychology, 66*(2), 248-258.
- Felix-Ortiz, M., & Newcomb, M. D. (1992). Risk and protective factors for drug use among Latino and White adolescents. *Hispanic Journal of Behavioral Sciences, 14*(3), 291-309.
- Gottfredson, D. C., & Koper, C. S. (1996). Race and sex differences in the prediction of drug use. *Journal of Consulting & Clinical Psychology, 64*(2), 305-313.
- Hanlon, T. E., Bateman, R. W., Simon, B. D., O'Grady, K. E., & Carswell, S. B. (2002). An early community-based intervention for the prevention of substance abuse and other delinquent behavior. *Journal of Youth & Adolescence, 31*(6), 459-471.

- 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*(1), 64-105.
- Hawkins, J. D., Lishner, D. M., & Catalano, R. F. (1985). *Childhood predictors and the prevention of adolescent substance abuse* (No. 86-1335). Washington, DC: National Institute on Drug Abuse: Research Monograph Series. No 56, US Department of Health & Human Services.
- Holland, J. A., Nelson, L., Ravikumar, P., & Elwood, W. N. (1998). Embalming fluid-soaked marijuana: New high or new guise for PCP? *Journal of Psychoactive Drugs*, *30*(2), 215-219.
- Jessor, R., Chase, J. A., & Donovan, J. E. (1980). Psychosocial correlates of marijuana use and problem drinking in a national sample of adolescents. *American Journal of Public Health*, *70*, 604-613.
- Kandel, D. B., Yamaguchi, K., & Chen, K. (1992). Stages of progression in drug involvement from adolescence to adulthood: Further evidence for the gateway theory. *Journal of Studies on Alcohol*, *53*(5), 447-457.
- Kingery, P. M., McCoy-Simandle, L., & Clayton, R. (1997). Risk factors for adolescent violence: The importance of vulnerability. *School Psychology International*, *18*(1), 49-60.
- Labouvie, E. W., Pandina, R. J., White, H. R., & Johnson, V. (1986). *Risk factors of adolescent drug use: A cross-sectional study*. Unpublished manuscript.
- Lenton, S., Boys, A., & Norcross, K. (1997). Raves, drugs and experience: drug use by a sample of people who attend raves in Western Australia. *Addiction*, *92*(10), 1327-1337.
- Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development*, *71*(3), 543-562.
- Lynskey, M. T., Fergusson, D. M., & Horwood, L. (1998). The origins of the correlations between tobacco, alcohol, and cannabis use during adolescence. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, *39*(7), 995-1005.
- Martin, C. S., Arria, A. M., Mezzich, A. C., & Bukstein, O. G. (1993). Patterns of polydrug use in adolescent alcohol abusers. *American Journal of Drug and Alcohol Abuse*, *19*(4), 511-521.
- Modesto-Lowe, V. (2002). Illy users in Connecticut: Two case reports. *Substance Abuse*, *23*(4), 255-257.
- National Institute for Drug Abuse. (2002). *High school and youth trends. Results from the Monitoring the Future Study*, from <http://www.nida.nih.gov/Infobox/HSYouthtrends.html>.
- Newcomb, M. D., Abbott, R. D., Catalano, R. F., Hawkins, J., Battin-Pearson, S., & Hill, K. (2002). Mediational and deviance theories of late high school failure: Process roles of structural strains, academic competence, and general versus specific problem behavior. *Journal of Counseling Psychology*, *49*(2), 172-186.
- Newcomb, M. D., & Felix-Ortiz, M. (1992). Multiple protective and risk factors for drug use and abuse: Cross-sectional and prospective findings. *Journal of Personality & Social Psychology*, *63*(2), 280-296.
- Newcomb, M. D., Maddahian, E., & Bentler, P. M. (1986). Risk factors for drug use among adolescents: concurrent and longitudinal analyses. *American Journal of Public Health*, *76*(5), 525-531.

- Reid, G., Aitken, C., Beyer, L., & Crofts, N. (2001). Ethnic communities' vulnerability to involvement with illicit drugs. *Drugs-Education Prevention & Policy*, 8(4), 359-374.
- Scheier, L. M., Botvin, G. J., Diaz, T., & Ifill-Williams, M. (1997). Ethnic identity as a moderator of psychosocial risk and adolescent alcohol and marijuana use: Concurrent and longitudinal analyses. *Journal of Child & Adolescent Substance Abuse*, 6(1), 21-47.
- Scheier, L. M., Newcomb, M. D., & Skager, R. (1994). Risk, protection, and vulnerability to adolescent drug use: Latent-variable models of three age groups. *Journal of Drug Education*, 24(1), 49-82.
- Schensul, J. J. (2001, July 20). *The Diffusion of MDMA Use among Urban Youth in Hartford, CT: Implications for Drug and HIV Prevention in Club Drug Users and their Networks*. Paper presented at the NIDA Conference, Ecstasy: MDMA/Ecstasy Research: Advances, challenges, future directions, Bethesda, MD.
- Schensul, J. J., & Burkholder, G. J. (2005). Vulnerability, social networks, sites, and selling as predictors of drug use among urban African American and Puerto Rican emerging adults. *Journal of Drug Issues*, 5(2), 379-408.
- Schensul, J. J., Convey, M., & Burkholder, G. J. (2005). Challenges in measuring concurrency, agency, and intentionality in polydrug research. *Addictive Behaviors*, 30 (3), 571-574.
- Schensul, J. J., Huebner, C., Singer, M., Snow, M., Feliciano, P., & Broomhall, L. (2000). The high, the money, and the fame: The emergent social context of "new marijuana" use among urban youth. *Medical Anthropology*, 18(4), 389-414.
- Singer, M., & Weeks, M. R. (1992). *Hartford Target Sampling Plan: Community Alliance for AIDS Programs*. Hartford, CT: Hispanic Health Council.
- Stouthamer-Loeber, M., Loeber, R., Wei, E., Farrington, D. P., & Wikstroem, P.-O. H. (2002). Risk and promotive effects in the explanation of persistent serious delinquency in boys. *Journal of Consulting & Clinical Psychology*, 70(1), 111-123.
- Szalay, L. B., Canino, G., & Vilov, S. K. (1993). Vulnerabilities and cultural change: Drug use among Puerto Rican adolescents in the United States. *International Journal of the Addictions*, 28(4), 327-354.
- Vega, W. A., Gil, A. G., & Wagner, E. (1998). Cultural adjustment and Hispanic adolescent drug use. In W. A. Vega & A. G. Gil (Eds.), *Drug use and ethnicity in early adolescence* (pp. 125-148). New York, NY: Plenum.
- 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.
- Velez, C. N., & Ungemack, J. A. (1995). Psychosocial correlates of drug use among Puerto Rican youth: Generational status differences. *Social Science & Medicine*, 40(1), 91-103.
- Warheit, G. J., & Gil, A. G. (1998). Substance use and other social deviance. In W. A. Vega & A. G. Gil (Eds.), *Drug use and ethnicity in early adolescence* (pp. 37-70). New York, NY: Plenum.
- Watters, J. K., & Biernacki, P. (1989). Targeted sampling: Options for the study of hidden populations. *Social Problems*, 36(4), 416-430.
- Wills, T. A., Vaccaro, D., & McNamara, G. (1992). The role of life events, family support, and competence in adolescent substance use: A test of vulnerability and protective factors. *American Journal of Community Psychology*, 20(3), 349-374.