Perceived Neighborhood Risk as a Predictor of Drug Use Among Urban Ethnic Minority Adolescents: Moderating Influences of Psychosocial Functioning

Lawrence M. Scheier
Nicole L. Miller
Michelle Ifill-Williams
Gilbert J. Botvin

ABSTRACT. This study examined the moderating influences of psychosocial functioning on the relation between perceived neighborhood risk and alcohol, cigarette, and marijuana use in a sample of inner-city, ethnic minority youths. Perceived neighborhood risk assessed gang activity, fighting, and neighborhood toughness. Measures of psychosocial functioning assessed intrapersonal and interpersonal skills implicated as correlates and predictors of early-stage drug use. Neighborhood risk uniquely predicted alcohol, cigarette, and marijuana use; however, some relations were qualified by level of psychosocial functioning. Negative affect, peer relations, and social concern moderated

Lawrence M. Scheier, Nicole L. Miller, Michelle Ifill-Williams, and Gilbert J. Botvin are affiliated with Weill Medical College of Cornell University, Institute for Prevention Research.

Correspondence concerning this article should be addressed to: Dr. Lawrence M. Scheier, Department of Public Health, Institute for Prevention Research, Weill Medical College of Cornell University, 411 East 69th Street, Kips Bay 201, New York, NY 10021 (E-mail: lmscheie@mail.med.cornell.edu).

Preparation of this article was supported partially by a research grant to Gilbert J. Botvin (P50DA-7656) from the National Institute on Drug Abuse.

Journal of Child & Adolescent Substance Abuse, Vol. 11(2) 2001

the effects of neighborhood risk on alcohol use. Negative affect moderated the relations between neighborhood risk and cigarette use. Risk-taking and family relations moderated the relations between neighborhood risk and marijuana use. Overall, the size of these effects was small and underscores the need to include a wider range of conceptually relevant measures. Longitudinally, neighborhood risk was uniquely associated with less protection and greater polydrug use, controlling for early levels of psychosocial risk and protection. Net of prediction, both risk and protection were associated equivalently with neighborhood risk. Findings indicate a need to develop a more complete understanding of the precise manner in which environmental risk increases susceptibility to early-stage drug use.

KEYWORDS. Neighborhood risk, adolescent drug use, psychosocial risk, ethnic minority youths

Recent evidence suggests that environmental factors may contribute to poor developmental outcomes among inner-city youths (e.g., Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993; Klein, Slap, Elster, & Schonberg, 1992; Department of Health and Human Services, 1986). Prominent environmental factors associated with adverse social, physical, and mental health conditions include violence, crime (Durant, Cadenhead, Pendergrast et al., 1994; Hammond & Yung, 1993; Paschall & Hubbard, 1998), and poverty (e.g., Brooks-Gunn, Duncan, & Aber, 1997; Klerman, 1993; National Center for Health Statistics, 1993). Evidence also is accumulating that ethnic minority youths, in particular, may be at increased risk because they disproportionately represent residents of inner cities. Unstable living conditions and socioeconomic hardships may expose ethnic minority youth to elevated levels of crime (Department of Justice, 1997), and economic hardships such as unemployment (Bureau of Labor Statistics, 1998).

Additional factors may contribute to increased vulnerability among inner-city, ethnic minority youths. More ethnic minorities live below the federal poverty level, divorce rates are higher among urban minority families, and minority youths are more likely to come from single-parent (female

headed) households (United States Bureau of the Census, 1996). Low-income neighborhoods containing high concentrations of single parent homes may not offer sufficient parental supervision nor provide adequate role models for developing conventional behavior. A number of studies have shown that youths from single-parent homes report higher rates of drug use than youths from two-parent homes (e.g., Farrell, Barnes, & Banerjee, 1995; Flewelling & Bauman, 1990; Selnow, 1987). Single parents may find it difficult to provide financial security (e.g., Dornbusch, Carlsmith, Bushwall et al., 1985) and chronic financial strain is linked with elevated rates of alcohol use (Pierce, Frone, Russell, & Cooper, 1996), and poor developmental outcomes (Conger, Conger, Elder et al., 1993).

Despite a growing interest in specifying whether environmental factors contribute to heightened vulnerability among inner-city youths, few studies have articulated a precise explanatory mechanism to account for these relations. The absence of this information may hinder further development of targeted interventions to reduce drug use among inner-city youths. To address these concerns, the present study briefly reviews findings from several studies that have identified certain environmental factors that may promote drug use. Empirical findings then highlight that perceived neighborhood contextual factors contribute to the beginning stages of drug use. Coupled with these findings, additional evidence suggests that individual-level characteristics can offset the effects of neighborhood contextual factors and should become a focus of prevention interventions to reduce risk among inner-city, ethnic minority youths.

EMPIRICAL EVIDENCE OF ASSOCIATIONS BETWEEN ENVIRONMENTAL FACTORS AND DRUG USE

A growing body of research shows that census-based indicators, including poverty (income and occupation levels), unemployment, welfare status, divorce rates, population density, and crime, provide valid indicators of drug use (e.g., Herd, 1994; Jones-Webb, Snowden, Herd et al., 1997; Kadushin, Reber, Saxe, & Livert, 1998). Jones-Webb et al. (1997), for example, reported that area-level measures of neighborhood poverty and individual-level measures of social class (income, occupation, education) correlate with high levels of drinking and drinking-related problems among African-American adult males but not Caucasian males (differences between Caucasian and Hispanic adults were not

significant). African-American males residing in impoverished neighborhoods reported more alcohol-related problems than Caucasian males living in similar neighborhoods.

Additional studies highlight that contextual factors including neighborhood cohesion and social organization are efficient predictors of drug use (e.g., Ennett, Flewelling, Lindrooth, & Norton, 1997; Gottfredson, McNeil, & Gottfredson, 1991; Simcha-Fagan & Schwartz, 1986). Research along these lines has shown that social area characteristics tapping social disorganization (i.e., poverty, welfare, divorce) and affluence (i.e., income, education) in combination with individual-level characteristics (e.g., race, peer influence, parental attachment, school bonding, community involvement, conventional beliefs) are associated with delinquency (Gottfredson et al., 1991) and drug use (e.g., Ennett et al., 1997). Ennett et al. reported that a broad catchall of census-derived indicators, including socioeconomic deprivation, population mobility, and social disorganization, combined with experiential factors, predicted drug use in a sample of elementary school children. Experiential factors included parental perceptions of neighborhood attachment, safety, drug activity, and school-level characteristics that tapped student's perceived norms for drug use, and perceived school climate. Controlling for individual-level risk, population density predicted cigarette use and mobility predicted alcohol use. Interestingly, rates of alcohol use and perceived alcohol norms were highest in areas that students rated as safer, and parents rated as higher, in neighborhood attachment. Based on census indicators these areas also were typified as lower in population density and mobility.

Studies that rely on census-based indicators provide an important foundation for establishing potential differences in drug prevalence rates based on social and economic factors. However, a drawback to studies of this nature is that whole groups are characterized by single aggregate-level statistics, and this may contribute to what Robinson (1950) termed an "ecological fallacy." That is, census-based economic indicators may not capture the wide socioeconomic variability that exists within a defined census tract. All individuals who reside in socially and economically disadvantaged areas are not drug abusers, and there may be wide differences with respect to how individuals cope with poverty and socioeconomic strain (e.g., Clayton, 1992). Moreover, studies that focus exclusively on census-based indicators can potentially gloss over subtle pieces of individual-level variation that contribute to drug use. Inner-city youths, for example, may not consider unemployment, social instability, and population demographics (i.e., ethnic minority

composition and housing resources) as personally self-relevant. Instead, these youths may pay closer attention to more proximal social pressures stemming from gang activity, street culture activities (e.g., fighting), and the perceived "toughness" of the neighborhood (e.g., safety walking to school).

Perceived Neighborhood Risk as a Predictor of Drug Use

Several studies have focused exclusively on examining the role of neighborhood and experiential factors as determinants of drug use (Blount & Dembo, 1984; Brook, Nomura, & Cohen, 1989; Crum, Lillie-Blanton, & Anthony, 1996; Dembo, Allen, Farrow, Schmeidler, & Burgos, 1985; Dembo, Blount, Schmeidler, & Burgos, 1986; Komro, Flay, Hu et al., 1998; Smart, Adlaf, & Walsh, 1994). Experiential factors encompass the individual's subjective perception of contextual factors. Generally, these perceptions include fear from fighting, neighborhood gang activity, racial tension, drug dealing, and visible street crime. Dembo and colleagues reported that patterns of drug use in a sample of inner-city youths varied depending on perceptions of the neighborhood as being tough, high in gang involvement, and filled with street culture activities (e.g., drug use and delinquency). The most involved users of alcohol and marijuana were more likely to report their neighborhood as replete with gangs, fighting, tension, and drug-abusing youths. Paths models linking neighborhood contextual factors and drug use contained greater numbers of predictive relations and accounted for more outcome variance in the high toughness neighborhood group (38%) compared to the medium (30%) and low toughness groups (28%).

Crum et al. (1996) reported that perceived neighborhood disadvantage (e.g., physical safety and cleanliness, crime, drug dealers, building decay, poverty) was moderately related to being offered cocaine among a sample of primarily African-American youths residing in high-risk neighborhoods. Overall, youths in the most disadvantaged neighborhoods (highest tertile of neighborhood risk) were significantly more likely to encounter active offers for drugs, adjusting for peer influence, gender, race, and age. Gang activity also is a prominent feature of high-risk, inner-city neighborhoods. Komro et al. (1998), for example, reported that African-American students with gang affiliations perceived certain aspects of their environments significantly more conducive to obtaining cigarettes, alcohol, and marijuana compared to non-gang affiliated students.

Despite these promising findings, not all studies have confirmed an independent explanatory role for experiential factors as predictors of drug use. Spencer, Swanson, and Glymph (1996) reported that neighborhood contextual factors (i.e., perceptions of neighborhood violence, police bias, and fear of people in the neighborhood and at school) did not significantly predict parental outcomes (i.e., depression and life dissatisfaction) in a sample of African-American adolescents, controlling for neighborhood ethnic diversity, crowding, joblessness, and poverty. Likewise, Brook et al. (1989) reported that perceived neighborhood context (i.e., cohesion, fear, satisfaction) did not contribute uniquely to drug use, controlling for family, peer, and school factors, in a sample of primarily white adolescents. To explain their findings, Brook et al. suggested that peer and family factors mediate the effects of neighborhood and school risk factors on drug use.

High levels of drug use, or social chaos, also may not typify high-risk neighborhoods. Seidman, Yoshikawa, Roberts et al. (1998) reported that census-based indicators of neighborhood poverty (i.e., income, occupation, education) and violence (i.e., homicide rates) along with experiential measures of neighborhood activities (e.g., hassles, support, cohesion) uniquely predicted antisocial behavior (i.e., alcohol use, delinquency, and negative involvement with peers) in a cohort of urban African-American youths. Contrary to expectations, however, youths living in moderate risk neighborhoods reported higher levels of antisocial behavior than youth residing in high-risk neighborhoods. Further analyses indicated that high levels of antisocial behavior were reported by youths living in neighborhoods characterized by modest levels of hassles and low levels of cohesion and involvement. The lowest levels of antisocial behavior were reported by youths residing in disconnected environments characterized by extremely low levels of neighborhood cohesion and modestly low levels of involvement and hassles.

Psychosocial Factors that Moderate the Effects of Perceived Neighborhood Risk

As this brief review indicates, census-based indicators combined with self-reported experiential factors can be informative with respect to the development of delinquency and drug use. However, researchers are increasingly becoming aware that certain individual-level factors may interact with environmental factors to promote drug use. This view is consistent with a developmental-contextual approach (Bronfenbenner, 1989), and provides a means of establishing linkages between individ-

ual differences in development and important contextual factors. One possible mechanism to account for these complex relations suggests that individual-level factors heighten or exacerbate the effects of environmental risk. The modulation of environmental, or even experiential factors, by individual-level factors sets up a framework for testing moderation. According to this framework, certain individuals who are high (or low) in a certain characteristic may be more or less vulnerable to contextual influences. A moderating effect of individual-level factors is theoretically interesting because of its implications for prevention. In the case where individual-level factors exacerbate or worsen the effects of environmental or experiential risk, various intervention strategies can target vulnerability and soften the impact of environmental risk.

Risk-taking provides a useful means to illustrate how individual-level factors may offset or worsen the effects of contextual influences. Risk-taking has been shown to play a prominent role in the early stages of adolescent drug use (e.g., Newcomb & McGee, 1991; Simon, Stacy, Sussman, & Dent, 1994; Wills, Vaccaro, & McNamara, 1994). Characteristic features of risk-taking include poor impulse control and disinhibition, which may set the tone for poor school performance, higher truancy, and school dropout rates (e.g., Simon et al., 1994). High risk-taking youths residing in socially disorganized neighborhoods may spend more unsupervised time on the streets with a net result of increasing their susceptibility to delinquency through increased exposure to street crime and antisocial behavior. Low risk-taking, on the other hand, is associated with greater social conformity, conventionality, and law abidance (e.g., Newcomb & Bentler, 1988), which should protect youths from engaging in delinquent activities and lower their exposure to high-risk environments.

In addition to exacerbating risk, individual-level factors may be protective and offset the effects of harsh environmental conditions. Factors that may contribute to resilience include competence, coping skills, and positive identity formation (Spencer, 1985; Spencer, Cole, Dupree et al., 1993; Spencer, Cunningham, & Swanson, 1995). Highly competent youths, for example, can draw upon various coping strategies that provide alternatives to drug use and antisocial behavior. Youths with high self-esteem and well-formulated identities may be impervious to the effects of negative environmental or social influences, and their families may provide adequate social support to maintain some insulation from adverse environmental situations.

To summarize, despite assertions that neighborhood experiential factors play a prominent role in fostering adolescent drug use, results from

empirical studies have been mixed or inconclusive. This has led to different interpretations to account for the effect of neighborhood risk on drug use (e.g., Brook et al., 1989). One promising line of inquiry that is consistent with an ecological framework suggests that individual-level factors may either heighten or reduce the impact of neighborhood risk on drug use. In most cases, low levels of individual-level vulnerability diminish the impact of neighborhood risk, whereas at heightened levels of vulnerability contextual risk exerts a greater impact and promotes drug use. In the present study, tests of the independent effects of neighborhood risk, and individual-level factors and their interaction, are conducted using hierarchical multiple regression procedures. In addition, a structural equation model (SEM) using one-year longitudinal data provides a multivariate framework to examine the effects of neighborhood risk on multiple drug use, controlling for cumulative levels of risk and protection. The longitudinal analyses rely on a risk factor methodology to combine the influences of individual-level factors into a model of cumulative risk. According to this approach, heightened vulnerability includes the combined influence of multiple risk and protective factors drawn from a wide range of psychosocial domains. Clarification of these mechanisms has great potential for the development, refinement, and implementation of effective prevention strategies targeted to high-risk, inner-city, ethnic minority youths.

METHOD

Sample Description

Data for the current study were collected as part of a short-longitudinal study of psychosocial functioning and drug use in a cohort of urban, ethnic minority youths. The study included five public middle schools from a major northeastern metropolitan city. Participating schools were selected based on district-wide blocking for high ethnic minority student composition. A total of 1,731 students were enrolled in the five schools and 1,503 students provided surveys (87% completion rate). Passive consent procedures were used, and less than 5% of the students failed to participate because of parental concerns or direct refusal from the student. Students were assured of the confidentiality of their responses in writing (both on the parental consent form and the questionnaire itself) and verbally at the time of administration (students were informed of a Certificate of Confidentiality from the U. S. Department

of Health and Human Services). Incomplete, missing, or suspect data (obvious repetitive patterns in student responses) rendered 83 surveys unusable. Only data from African-American and Hispanic youths were included in the present study, producing a final baseline sample size of 1,138 students. The average age of these students was 13.0 years (SD = 0.7), and 51% of the sample was female.

Sampling methods for the present study intentionally drew from lower SES catchment areas, and this was supported by the high levels of youth reporting they either received federally subsidized lunch (55%) or lunch at a reduced price (4.3%), or did not eat lunch at all (27.4%). The remaining youths reported that they brought lunch from home (5%), purchased lunch outside the school (4%), paid full price (3.4%), or went home (1%) for lunch. Forty-two percent of the participants reported that they reside in an intact (nuclear) living situation, 34% with their mother only, 14% in a blended family situation (one biological parent and a stepparent), 2% with their father only, 6% with other relatives, and 2% alternating between parents. Less than one percent of the students reported they lived with a guardian, in a foster situation, or without any parental supervision (i.e., with friends). Compared to male students, female students reported that they were more likely to reside in a non-nuclear living situation, $\chi^2(1) = 10.63$, $p < .001$ (54% vs. 45% for females vs. males, respectively) and African-American youths reported they were more likely to reside with one but not both parents, $\chi^2(1) = 9.56$, $p < .01$ (76% versus 24% for African-American versus Hispanic youths, respectively).

Measures

Behavioral items. Frequency of alcohol (including beer, wine, or liquor), cigarette (including cigars or pipes), and marijuana use (including pot and hashish) was assessed over the past six-month period on a seven-point scale ranging from 1 (never) through 7 (more than once a day). Additional alcohol items tapped quantity ("how much, if at all, do you usually drink each time you drink?"), scaled from 1 (I don't drink) through 6 (more than 6 drinks), and drunkenness ("how often, if ever, do you get drunk?"), scaled from 1 (I don't drink) through 9 (more than once a day). The three alcohol items were weighted and averaged using a percentile-based weighting scheme proposed by Douglass and Khavari (1982). Each response point is calculated as the halved frequency of youths responding to the item, plus an additive component capturing the number of youths responding to lower ranked response

options, the sum of which is then divided by the total responding sample. Percentile-based weighting effectively eliminates marked skewness (such nonnormality is often encountered with self-report drug use measures) and centers the distribution on a midpoint corresponding to the 50th percentile. This method indexes more extreme behaviors (e.g., drunkenness) according to the proportion of youths reporting the behavior.

Two additional marijuana use items assessed intensity ("on the occasions that you smoke marijuana, how often do you smoke enough to feel pretty high?"), with responses ranging from 0 (I do not smoke marijuana at all) through 5 (on nearly all of the occasions), and quantity ("when you smoke marijuana, how much do you usually smoke in one occasion?"), with response ranging from 0 (I do not smoke) through 5 (more than 6 joints). The same percentile-based weighting scheme was used for the marijuana items and an average marijuana involvement score was constructed from the frequency, quantity, and intensity items.

Psychosocial measures. Single item measures of school performance, absenteeism, and church attendance assessed conventional behavior. Self-reported grades ("what grades do you generally get in school") ranged from 1 (D's or lower) through 5 (mostly A's), absenteeism ("about how many days were you absent from school last year") ranged from 1 (none) through 5 (16 or more days), and church attendance ("how often do you attend church or religious services") ranged from 1 (never) through 4 (about once a week). Risk-taking was comprised of six items taken from the Eysenck and Eysenck (1975) sensation-seeking scale (e.g., "I get a real kick out of doing things that are a little dangerous," $\alpha = .75$), with responses ranging from 1 (not at all) through 4 (quite a lot). Six items drawn from several self-efficacy and internal control batteries (Paulhus, 1983; Sherer, Maddux et al., 1982) assessed expectations of success specific to schoolwork (e.g., "I feel that I can really put my mind to it and do well in school"), and academic tasks (e.g., "If I want to, I can really sit down and work hard at learning something": $\alpha = .84$), with response categories ranging from 1 (really not true for me) through 5 (really true for me). Selection of these six items from the larger pool of efficacy items reported in Sherer et al. and Paulhus was based on the magnitude of their factor loading ($> .50$) in these respective studies and their content specificity tapping planning and internal control mechanisms.

Six items were taken from the Self-Image Questionnaire for Young Adolescents (SIQYA: Petersen, Schulenberg, Abramowitz, Offer, & Jarcho, 1984) to assess family cohesion and perceived instrumental

support from family members (e.g., "I don't think that anyone in my family really understands me" and "I don't think that my family values my opinion when a family decision is made"). Psychometric information reported by Petersen et al., based on factor analyses using an adolescent sample, shows moderately high estimates of internal consistency for a subscale assessing social context of family support ($\alpha = .88$). Reliability in the present sample for a slightly modified version of this subscale was lower ($\alpha = .54$).[1] Five items were used to tap perceived friendship and peer relations (e.g., "I get plenty of help and support from my friends": $\alpha = .63$). Response categories for both sets of items ranged from 1 (never) through 5 (almost always). The moderately low scale reliabilities for the family and friend support items precluded using them as ordinal scales (and forming mean composites). Distributional characteristics showed several items to be moderately skewed, whereas other items had normal central tendency. Therefore, individual family and friend support items were recoded into dichotomies using the scale midpoint to designate "risk" and "no-risk." Summed indices of family risk and peer risk were then constructed independently.

Six items were used to assess health locus of control (e.g., "Most of the time, I get better because I listen to the doctor or nurse," $\alpha = .62$). These items were drawn from a wide range of health locus of control scales (e.g., Marshall, 1991; Strickland, 1978). All six items were scaled toward internal control in health-related matters and response categories ranged from 1 (this describes me always) through 5 (this never describes me). Five items assessed perceived hopelessness and life purpose (e.g., Beck, Weissman, Lester, & Trexler, 1974; Crumbaugh & Maholick, 1964: e.g., "I could describe my life as filled with purpose and meaning," $\alpha = .75$) with response categories ranging from 1 (this never describes me) through 5 (this describes me always). Five items from a self-esteem inventory (Fleming & Watts, 1982) assessed social confidence and social anxiety (e.g., "I find it hard to start a conversation when I meet new people," $\alpha = .70$) with response categories ranging from 1 (strongly disagree) through 5 (strongly agree). Five items assessed applied decision-making skills (Wills, 1986: e.g., "think of as many possible choices or ways of solving the problem as I can," $\alpha = .83$) with response categories ranging from 1 (never) through 5 (always). Three items from the Mental Health Inventory (Veit & Ware, 1983) assessed positive affect and depressive symptomatology (e.g., "I generally enjoyed the things that I did," $\alpha = .69$), and five items (e.g., "I was bothered by nervousness or anxiety," $\alpha = .77$) assessed negative affect

and anxious symptoms (Langner, 1962). Response categories for both sets of items ranged from 1 (never) to 5 (almost always).

Ten items assessed negative life events across four domains appropriate for adolescents. The domains included school (e.g., "I did not get into a club or sport I really wanted to be involved in"), family (e.g., "My family and I moved to a new home"), friendship (e.g., "I had an argument with a close friend"), and sickness (e.g., "I became seriously ill or was hospitalized"). Items were drawn from several well-documented life event checklists (e.g., Cohen & Hoberman, 1983; Johnson & McCutcheon, 1980; Newcomb, Huba, & Bentler, 1981; Sarason, Johnson, & Siegel, 1978) and have been shown to be a reliable predictor of drug use (e.g., Scheier, Botvin, & Miller, 1999). Using a common stem ("to what degree this event had a positive or negative impact on your life"), students rated each item with respect to whether the event had a negative or positive impact on their life. Ratings ranged from −3 (extremely negative) through + 3 (extremely positive), with a neutral midpoint of zero (i.e., no impact). Although some were negative and some were positive, events rated as having a negative impact were assigned to an index of negative life events. The index was weighted proportionately to reflect the total number of negatively worded events (7 out of 10). Negative life event scores ranged from 0 to 21 with mean number of negative events as 5.0 (SD = 5.4). Five items were used to assess perceived neighborhood risk (Dembo et al., 1985: e.g., "you've got to be tough to get along in my neighborhood," $\alpha = .76$). Response categories for this scale ranged from 1 (strongly disagree) to 5 (strongly agree).

Construction of Risk and Protective Indices for the Longitudinal Model

To create indices of cumulative risk (and protection) for the longitudinal model, each of the 14 measures of individual-level risk was dichotomized based on the upper, or respectively lower, third of the distribution. Scores indicative of high vulnerability are coded "1" to designate risk, and the remaining portion of the distribution coded as "0." Binary coded risk factors were summed into a unit-weighted index of cumulative risk, and this index was used to predict level or extent of drug use. An index of protection was created in the same fashion however, instead of weighting individuals in the high-risk portion of the distribution with a "1," individuals reporting high levels of protection (i.e., high resilience) were assigned "1" with the remainder assigned "0." Hypotheses based on previous empirical studies suggest these two indices

would correlate moderately and contribute uniquely to predicting drug use (Félix-Ortiz & Newcomb, 1992; Scheier, Newcomb, & Skager, 1994).

Both grades and church attendance could not be dichotomized at the upper or lower 33rd percentile; thus a median split was used in each case. The risk index included the measure of self-reported grades and the protection index included the measure of church attendance. The mechanism for creating risk and protective indices was implemented again for Time 2 psychosocial measures.

RESULTS

Distributions for Drug Use Measures

Two-thirds of the students at Time 1 reported abstaining from alcohol. Slightly under one-quarter (21.5%) reported using alcohol once or twice, and the remainder (10%) reported some ongoing experimental use (two to three times a month or greater). Almost 90% of the students reported never using marijuana, with the remaining 10% reporting some experimental use (from a few times per month to daily). Eighty-six percent of the students reported never having tried cigarettes; 11.5% reported some experimental use (once or twice), with the remaining 2.6% reporting weekly or daily cigarette use. At Time 2, there was a dramatic increase in the proportion of youths engaged in early-stage drug use. Only 58.7% of the follow-up sample abstained from alcohol use, whereas 41.4% reported monthly or greater use of alcohol. As an indication of problem alcohol use, 2.8% of the students reported being drunk at least a few times per month, and 2.1% reported drunkenness more than monthly. A majority of students still abstained from marijuana use; however, in comparison to Time 1, 6.6% of the students had tried marijuana once or twice and 8.7% had used marijuana more than just a few times (i.e., monthly or greater). A little more than three-quarters of the students (78.4%) never smoked cigarettes, 11% had smoked cigarettes on a few occasions, and 11% reported using cigarettes on a monthly or weekly basis. Across the one-year period, there were significant gains in alcohol (28.6% gain in new users), marijuana (10.63% gain), and cigarette (16.22% gain) users (p's $< .001$).

Tests of the main and interactive effects of race and gender indicated that Hispanic youths reported more drunkenness, $F(1) = 8.32$, $p < .01$ (1.52 versus 1.36 for Hispanic versus African-American youths, respec-

tively), more intense marijuana use, $F(1) = 56.30$, $p < .001$ (0.60 versus 0.21 for Hispanic and African-American youths), and getting high on marijuana more often, $F(1) = 91.66$, $p < .001$ (0.81 versus 0.30 for Hispanic versus African-American youths). There was a significant gender $\times$ race interaction for frequency of cigarette use, $F(3, 1125) = 2.95$, $p < .05$. Multiple comparison tests indicated that female Hispanics reported higher levels of cigarette use (1.53) than male Hispanics (1.30), male African-American (1.24), and female African-American youths (1.19). These same analyses based on the panel sample for the Time 2 drug measures indicated a main effect of race for drinking frequency, $F(1) = 25.26$, $p < .001$ (1.96 versus 1.56 for Hispanic and African-American youths); drinking intensity, $F(1) = 57.89$, $p < .001$ (1.98 versus 1.40 for Hispanic and African-American youths); drunkenness, $F(1) = 21.39$, $p < .001$ (1.66 versus 1.33 for Hispanic and African-American youths); cigarette use, $F(1) = 28.26$, $p < .001$ (1.77 versus 1.30 for Hispanic and African-American youths); and a main effect of gender for marijuana intensity, $F(1) = 5.64$, $p < .05$ (1.35 versus 1.21 for males and females, respectively).

Attrition Analyses

Despite aggressive efforts to track students longitudinally, there was some loss of students across the one-year period, much of which was due to absenteeism or relocation. One school refused to participate in the follow-up phase, and a mail survey procedure was utilized for these students ($N = 422$ in the total study from this school and $N = 362$ who identified as ethnic minority youths). The total response rate for the school was 40% (based on all available students in the school). A disproportionate number of students in the non-participating school were African-American, $\chi^2(1) = 110.7$, $p < .0001$ (93% versus 7% for African-American versus Hispanic youths). The response rate for the mail survey was 46% ($N = 165$). Students responding by mail were more likely to be males, $\chi^2(1) = 11.8$, $p < .001$ (67.3% versus 32.7% for males and females, respectively). Mean comparisons using the student's t-test indicated no significant differences between mail respondents and non-respondents based on 14 measures of psychosocial functioning. Likewise, regression models predicting three drug frequency measures (alcohol, cigarettes, and marijuana) from mail response indicated no systematic behavioral differences between students completing the mail survey and non-respondents. A regression model predicting mail survey response (0 = no and 1 = yes) indicated that social concern ($\beta =$

.15, SE = .01, $p < .04$) and grades ($\beta = .22$, SE = .05, $p < .005$) were significantly associated with mail return status. Additional analyses indicated that students in the non-participating school who were present at follow-up also were not different significantly on any of the psychosocial measures from all other students who participated at Time 1.

Including the mail survey portion, the follow-up retention was 70% (N = 794). The resultant follow-up sample was disproportionately comprised of female, $\chi^2(1) = 7.03$, $p < .01$ (73.3% versus 66.1% for female and male panel youths, respectively) and Hispanic students, $\chi^2(1) = 44.77$, $p < .001$ (84.4% versus 64.1% for Hispanic and African-American panel youth, respectively). Family status (intact versus broken) was not significantly related to retention status (or to responding by mail). Of the three drug use measures only marijuana involvement was significantly higher among dropout compared to panel students, $t(531) = 2.34$, $p < .05$.

To determine if any systematic bias influenced the panel sample, retention status (panel = 1 and dropout = 0) was regressed on the complete set of demographic, drug use and psychosocial measures. This model accounted for 32% of the variance in retention, $F(21,545) = 12.15$, $p < .001$. Significant predictors of retention included being Hispanic ($\beta = -.16$, $p < .001$), higher grades ($\beta = .10$, $p < .05$), less life purpose ($\beta = -.11$, $p < .01$), and less internal health locus of control ($\beta = -.52$, $p < .001$). Despite the systematic loss of African-American youths and students reporting lower grades, there was a substantial gain in drug users across the one-year period as well as substantial increases in the levels of drug use. These increases coupled with the absence of any real discernible pattern of systematic bias to the panel sample provides an encouraging basis to further examine correlates and predictors of drug use in this sample.

Cross-Sectional Analyses Testing Moderation

Analyses testing main and buffering effects were conducted separately for alcohol, marijuana, and cigarette use. Each regression model controlled for gender, race, and family status (intact versus other). The individual models included hierarchically a main effect for neighborhood risk followed by psychosocial functioning and an interaction term (risk $\times$ psychosocial functioning). A significant interaction term indicates that the relation between neighborhood risk and drug use is contingent on specific levels of the moderator (i.e., psychosocial functioning). Following conventions outlined by Aiken and West (1991), both the neighborhood risk measure and the moderators were centered as devia-

tion scores (the interaction term then represents the multiplication of these two centered predictors). This method reduces problems associated with multicollinearity and scale invariance that may hinder detection of significant interactions (Dunlap & Kemery, 1987; McClelland & Judd, 1993).

Results of the hierarchical models for each of the drug use measures are contained in Table 1. Neighborhood risk independently predicted alcohol in each of the models tested. Average proportion of variance accounted for in alcohol involvement was 5%, and ranged from a low of 4% (in several models) to a high of 10% in the model containing risk-taking. Main effects (standardized coefficients) for neighborhood risk ranged from a low of .08 ($p < .05$) for the model including risk-taking to a high of .18 ($p < .001$) in the model containing negative life events (the complete set of regression statistics is available from the first author).

For the alcohol models, peer relations, social concern, and negative affect all moderated the relations between neighborhood risk and alcohol.[2] Post hoc probing of the form of the interaction provides specific detail regarding whether the moderator reduces or exacerbates the influence of perceived neighborhood risk. Figures 1a-c contain the plots of the significant interactions and show the simple slopes corresponding to medium (the mean), low (one standard deviation below), and high (one standard deviation above) levels of the moderator. As depicted, with increasing levels of neighborhood risk, high scores on peer relations (indicative of poor peer relations) attenuated alcohol use, whereas the absence of poor peer relations was associated with higher levels of alcohol use. For the social concern model, as neighborhood risk increased high scores on social concern (reflecting greater interpersonal anxiety) were associated with lower levels of alcohol use, whereas low social concern were associated with higher levels of alcohol use. For the model containing negative affect, as neighborhood risk increased, high levels of anxiety and irritability was associated with lower alcohol use, whereas low levels of anxious symptomatology were associated with higher levels of alcohol use.

Table 1 also contains the summary statistics from the hierarchical regression models testing marijuana and cigarette use. In the models predicting marijuana involvement, risk-taking was again the strongest predictor ($\beta = .18$, $p < .001$) and this model accounted for the most variance ($R^2 = .06$). Average proportion of variance accounted for across all 14 models was 3%. With a few exceptions, neighborhood risk uniquely predicted marijuana involvement (with the exception of models including positive affect, negative affect, peer relations, social concern, health locus, and church attendance). Main effect sizes for neighborhood risk

TABLE 1. Main Effects and Interactions from Moderated Multiple Regression Analyses

Predictor	Alcohol β	Alcohol ΔR^2	Marijuana β	Marijuana ΔR^2	Cigarettes β	Cigarettes ΔR^2
Neighborhood (NBRHD)	.006***	.038	.005***	.027	.002	.014
Positive Affect (PA)	−.003	.039	−.001	.027	−.005	.019
NBRHD × PA	.001	.041	–	–	.001	.024
Neighborhood	.006***	.034	.005*	.027	.003	.013
Negative Affect (NA)	.004*	.039	.002	.030	.003	.016
NBRHD × NA	−.001*	.047	−.000	.031	−.001*	.025
Neighborhood	.003	.038	.002	.024	.001	.013
Risk-taking (RT)	.016***	.102	.008***	.054	.010***	.048
NBRHD × RT	−.000	.103	.001*	.061		
Neighborhood	.006***	.037	.005***	.026	.002	.014
Purpose in Life (PL)	−.005**	.049	−.004***	.037	−.007***	.040
NBRHD × PL	.000	.050	–	–	–	–
Neighborhood	.006***	.038	.004**	.024	.002	.013
Family Risk (FR)	.003***	.056	.003***	.042	.003***	.033
NBRHD × FR	–[a]	–	.001***	.049	−.000	.034
Neighborhood	.006***	.039	.005***	.025	.003*	.013
Peer Risk (PR)	.002	.040	−.000	.026	.002	.015
NBRHD × PR	−.001*	.047	–	–	−.000	.018
Neighborhood	.007***	.040	.005***	.021	.004**	.015
Social Concern (SC)	−.001	.041	−.002	.025	−.003[m]	.020
NBRHD × SC	−.001	.048	−.000	.027	–	–
Neighborhood	.006***	.039	.004***	.023	.003*	.015
Decision Skills (DS)	−.008**	.063	−.005***	.039	−.007***	.039
NBRHD × DS	–	–	–	–	–	–
Neighborhood	.006***	.032	.004***	.021	.003*	.017
Cognitive Mastery (CM)	−.005***	.045	−.003*	.027	−.005*	.035
NBRHD × CM	–	–	–	–	–	–
Neighborhood	.006***	.030	.004*	.018	.003*	.018
Locus of Control (LC)	.005***	.039	.000	.019	.003*	.023
NBRHD × LC	−.000	.041	–	–	–	–
Neighborhood	.007***	.030	.004**	.018	.003**	.018
Absenteeism (ABS)	.021**	.042	.009	.022	.011*	.021
NBRHD × ABS	.002	.046	–	–	–.002[m]	.026
Neighborhood	.008**	.032	.004***	.021	.003**	.017
Negative Life Events (NLE)	.002	.034	.002*	.026	.003*	.024
NBRHD x NLE	−.000	.035	–	–	–.000	.025

TABLE 1 (continued)

Predictor	Alcohol β	Alcohol ΔR^2	Marijuana β	Marijuana ΔR^2	Cigarettes β	Cigarettes ΔR^2
Neighborhood	.008**	.032	.004***	.021	.003**	.017
Negative Life Events (NLE)	.002	.034	.002	.026	.003	.024
NBRHD x NLE	−.000	.035	–	–	–.000	.025
Neighborhood	.007***	.031	.004**	.018	.003*	.019
Grades (GRD)	−.019	.037	−.023***	.032	–.025***	.034
NBRH D x GRD	−.003	.040	–	–	–	–
Neighborhood	.007***	.031	.004***	.019	.004**	.017
Church (CHR)	−.003	.031	−.002	.019	–.008	.019
NBRHD x CHR	–	–	−.001	.020	.001	.020

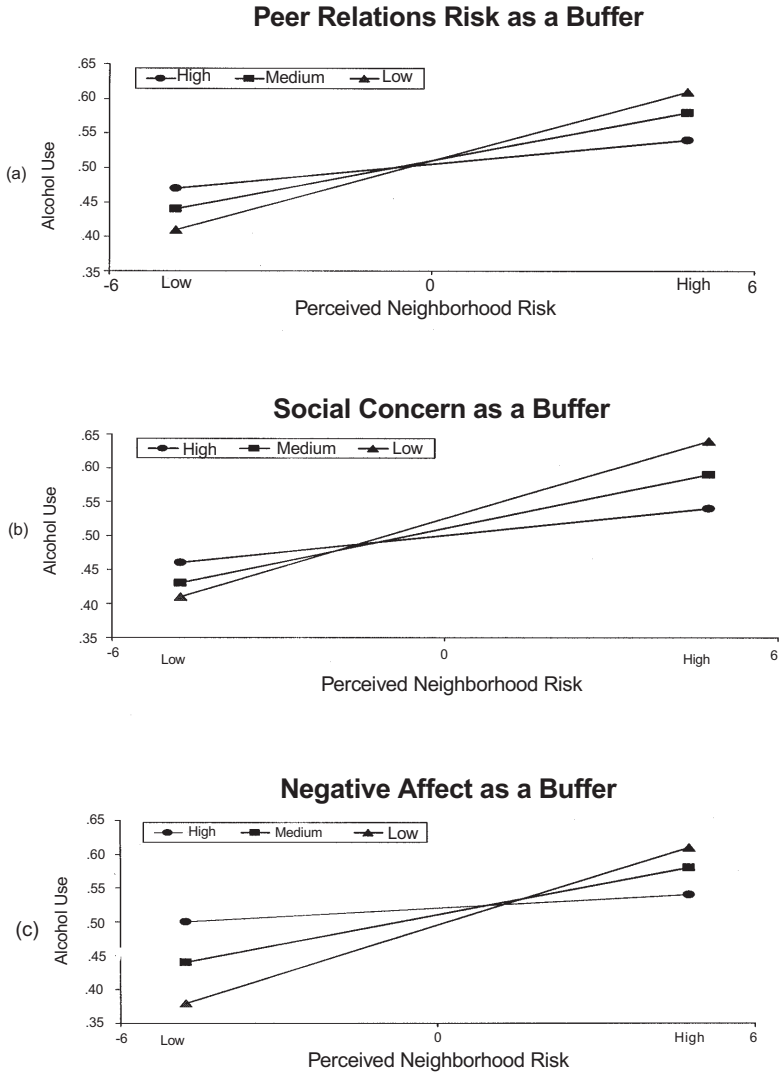
Note. N = 1,138. [a] Tolerance criteria for entry into model not met. Unstandardized regression coefficients are based on hierarchical models in which each effect was entered in the order specified in the table. Significance levels correspond to the parameter values at the final step that included both main effects and the interaction term. The ΔR^2 term is cumulative and includes variance attributed to preceding steps. An initial step controlled for demographic characteristics (race, gender, and intact family status), although the corresponding coefficients for this block are not tabled.

*$p \leq .05$, ** $p \leq .01$, *** $p \leq .001$, m = $p \leq .06$ (one-tailed).

ranged from a low of .07 ($p < .06$) in the model containing risk-taking to a high of .15 ($p < .001$) in the model containing peer relations. The largest effect size overall for the psychosocial measures was associated with risk-taking ($\beta = .18$, $p < .001$). Risk-taking and family relations moderated the relation between neighborhood risk and marijuana use. Figure 2a shows that as neighborhood risk increased low levels of risk-taking had a protective effect and are associated with low levels of marijuana use, whereas high risk-taking was associated with higher levels of marijuana use. Figure 2b shows that as neighborhood risk increased the levels of marijuana use increased for students reporting poor family relations compared to students reporting a modicum of family support.

Average proportion of variance accounted for in cigarette use was 3%. Neighborhood risk uniquely predicted cigarette use in all of the models except those containing positive affect, risk-taking, life purpose, and family relations risk. Controlling for individual-level factors, the largest effect size for neighborhood risk was in the model containing social concern ($\beta = .11$, $p < .01$) and the largest coefficient for the individual-level factors was in the model containing risk-taking ($\beta = .20$, $p < .001$). Negative affect moderated the relations between neighborhood risk and cigarette use. Figure 2c shows that high negative affect offset the deleterious effects of the perceived environment and was associated

FIGURE 1. Moderating effects of (a) peer relations, (b) social concern, and (c) negative affect on the relation between perceived neighborhood risk and alcohol use.



with lower levels of cigarette use and low negative affect was associated with higher levels of cigarette use.

Results of the SEM Model Testing Cumulative Risk

Next, a longitudinal model considered the effects of all 14 measures of psychosocial functioning (specified as indices of cumulative risk and protection) combined with perceived neighborhood risk on later drug use. This analysis complements the previous moderator analyses in two ways: First the analysis captures the precise mechanism through which cumulative risk influences drug use; and second the model determines whether neighborhood risk provides additional unique predictive information. Testing the incremental variances for each individual risk or protective factor separately would inflate considerably the Type I error rates. To avoid this problem, model specification included indices of cumulative risk and protection that reflected the individual and joint actions of each of the 14 psychosocial measures.

Table 2 shows the proportion of students designated as "at-risk" or "protected" for each psychosocial measure. Proportional differences in risk or protective status based on gender and race are contained in the far right portion of Table 2. These tests were conducted both for Time 1 and Time 2 risk factors to determine if there was any change in risk or protective status over time based on gender or ethnic status. At Time 1, males were more likely to be at risk for poor grades and negative life events, whereas females were more likely to be at risk for low positive affect.

At Time 2 (panel sample), males were more likely to be at risk for poor grades, poor peer support, social anxiety, and more negative life events, whereas females were at greater risk for low positive affect. Among the ethnic comparisons, a greater proportion of African-American students reported risk for social anxiety, poor decision skills, low perceived mastery, risk-taking, and higher absenteeism. Inspection of the distributions of the risk and protective indices indicated that modal number of risk factors at Time 1 was four (0 to 12) and three at Time 2 (0 to 10). Both the risk and protective indices were distributed normally at both Time 1 and Time 2. Three-quarters of the students reported between none and six risk factors at Time 1 and between none and five risk factors at Time 2. Modal number of protective factors was five at Time 1 (range 0 to 9) and four at Time 2 (range 0 to 10). Three-quarters of the students reported between zero and seven protective factors at Time 1 and between zero and five protective factors at Time 2. Males reported

FIGURE 2. Moderating effect of (a) risk-taking and (b) family relations on the relation between perceived neighborhood risk and marijuana use. Moderating effect of (c) negative affect on the relation between perceived neighborhood risk and cigarette use.

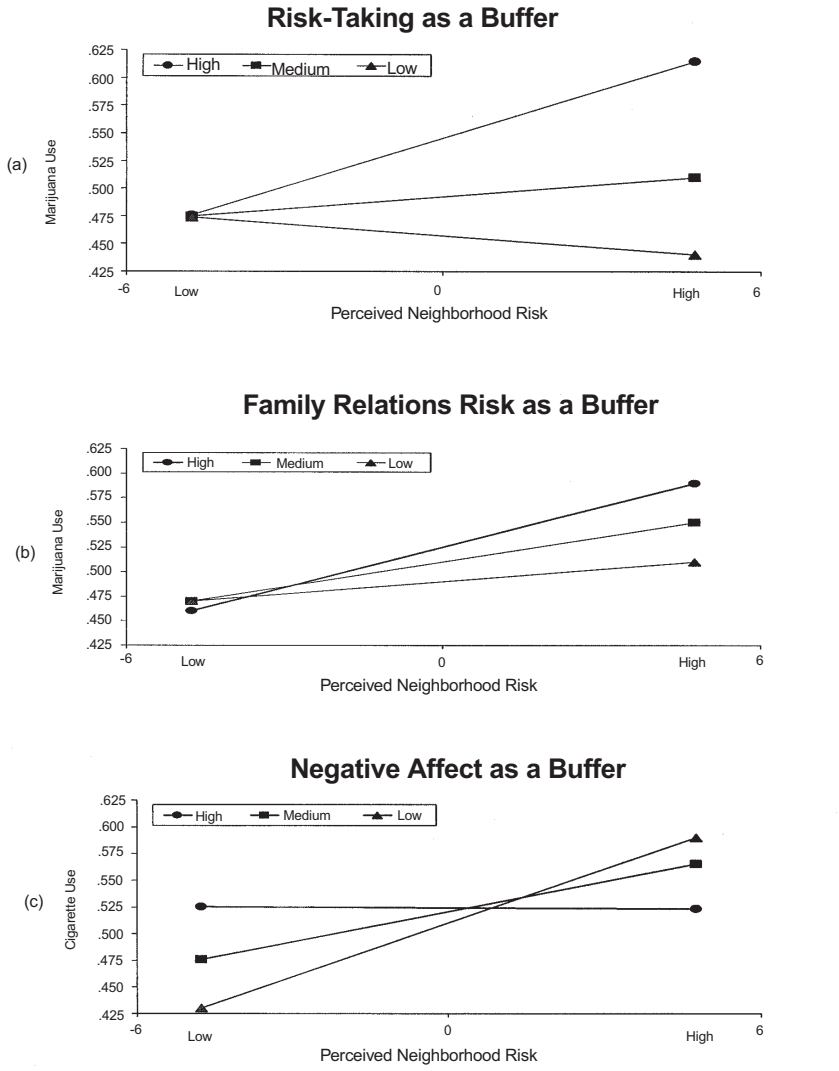


TABLE 2. Distributions for Risk and Protective Factors: Gender and Race Differences

	% Risk		% Protection		Gender Differences				Race Differences			
	T_1	T_2	T_1	T_2	R-T_1	R-T_2	P-T_1	P-T_2	R-T_1	R-T_2	P-T_1	P-T_2
Grades	54.0	50.2	–[b]	–	.001	.013						
Positive Affect	29.7	27.6	30.5	29.9	.017	.007						
Negative Affect	27.9	23.0	25.8	21.5	.003		.001					
Risk-Taking	26.3	33.9	26.6	33.8						.001		.001
Life Purpose	26.1	32.0	34.4	34.6								.017
Family Relations	30.8	31.3	17.9	25.8								
Peer Relations	31.5	34.6	34.9	43.0		.001		.001				
Social Concern	33.9	29.5	32.3	35.5		.028			.001	.001	.001	.001
Decision Skills	33.6	36.9	31.3	29.4						.033	.015	
Cognitive Mastery	29.1	30.0	32.0	28.3					.001	.001	.048	.016
Health Locus	32.0	32.3	34.6	34.9								
Absenteeism	28.6	36.6	36.6	30.4					.001	.002	.001	.002
Negative Life Events	28.2	33.1	27.8	28.8	.001	.001	.018	.01				
Church Attendance	–[a]	–	56.6	55.7			.006	.05			.001	

Note. R-T_1 = Risk at Time 1; P-T_1 = Protection at Time 1.

[a] Tabled values are significance levels by χ^2 proportional test. A pretest significance level of .003 should be used when reading these results to reduce the probability of making one or more Type I errors (i.e., experimentwise error rate).

[b] Median split used for this measure. Church Attendance was included in the risk index, whereas Grades was included in the protective index.

significantly higher levels of risk at Time 2 ($X_M = 4.44$ versus $X_F = 3.98$; $t = 2.55$, $p < .05$) and females reported significantly higher protection at Time 2 ($X_F = 4.61$ versus $X_M = 4.15$; $t = 2.62$, $p < .01$). Hispanic youths reported significantly higher levels of cumulative risk at Time 2 ($X_H = 4.71$ versus $X_B = 3.89$; $t = 4.42$, $p < .001$) and African-American students reported significantly higher levels of protection ($X_B = 4.61$ versus $X_H = 4.04$: $t = 3.12$, $p < .01$).

The EQS statistical program (Bentler, 1995) was used to conduct the structural model analyses. Structural modeling (i.e., covariance structure analysis) is a complete-data method and requires that no cases have missing values. Inspection of the data showed that each assessment period contained a small percent of missing data.[3] To remedy this situation, a full-information, maximum likelihood, estimation procedure with the Expectation-Maximization (EM) algorithm was used to impute missing data (Graham, Hofer, & MacKinnon, 1996; Shafer, 1997). Based on levels of missingness, a total of five augmented data sets were created.[4] Subsequent statistics derived from the SEM analyses are point estimates and represent an average across the five imputed datasets. These estimates reflect missing-data uncertainty and are unbiased and more efficient than those obtained through mean substitution, listwise deletion, or regression-based imputation procedures.

The SEM specifies indices of risk and protection at both Time 1 and Time 2. Consistent with the analyses to detect moderation, Time 1 exogenous measures also included indicators of gender, family status (intact versus other), and racial group (African-American vs. Hispanic). Neighborhood risk was assessed as a continuous measure at Time 1.[5] Indicators of alcohol, cigarettes, and marijuana reflected a latent construct of Polydrug Use at both Time 1 and Time 2. This construct reflects a tendency to engage in high-risk, multiple drug use, with drugs used either in combination (e.g., alcohol and cigarettes) or separately but within a common time frame (i.e., all drug items tapped recent use). Model specification included stability paths for polydrug use, risk, protection, and correlated residuals between repeated measures of individual drug indicators (i.e., alcohol at Time 1 to alcohol at Time 2). The inclusion of correlated residuals captures the specific developmental patterns associated with alcohol, for example, across the one-year period that may be distinct from stable patterns of multiple drug use.

This initial model based on an imputed covariance matrix fit well, $\chi^2(37) = 77.043$, $p < .001$, Comparative Fit Index (CFI) = .984, Root Mean Square Residual (RMSR) = .026, and Root Mean Square Error of Approximation (RMSEA) = .037. The low RMSR indicates almost

complete residualization of the sample covariance matrix and the small ratio of χ^2:df (2.1) indicates a good fit between the implied population model and sample covariances. The RMSEA is an indication of badness-of-fit where small numbers closer to zero are better. A second stage in the model-fitting portion of the analysis included addition of nonstandard (unique) effects. Nonstandard effects essentially capture relations between indicators of multiple drug use and later vulnerability (i.e., risk and protection) and reflect important causal sequences that are not attributed to across-time stability or reflect a priori hypothesized effects. For instance, in addition to predicting later vulnerability (risk and protection) from early polydrug use, nonstandard effects might include prediction of specific alcohol or marijuana use from indicators of early vulnerability. Fine-tuning SEMs and inclusion of nonstandard effects relies on post hoc specification searches using the LaGrange Modification indices (Chou & Bentler, 1990). According to MacCallum (1986), post hoc specification searches are essential to obtain the "true" model and are considered robust with moderate (N = 500) sample sizes. Searches included paths from early drug use (i.e., alcohol only) to later vulnerability and likewise from early vulnerability to later drug use. Following the addition of several substantively meaningful unique effects, a final model was obtained, which was then tested with the five augmented data sets.[6]

Figure 3 shows the results of the final SEM (coefficients represent point estimates derived by averaging across the five imputed data sets). Both unstandardized and standardized (parentheses) regression coefficients are included (only significant paths are shown). The significant stability effect for polydrug use indicates that students engaged in multiple drug use were likely to remain multiple drug users a year later. Early multiple drug use at Time 1 was associated with elevated levels of risk and lower levels of protection at Time 2. Both protection and risk remained relatively stable over the one-year period and early risk was associated with decreased subsequent protection, controlling for early levels of vulnerability.

Among the three demographic measures, being male was associated with lower levels of protection at Time 2 and being African-American was associated with lower levels of risk and higher levels of protection. Family status did not influence significantly any of the Time 2 measures (drug use or the risk/protection indices). Controlling for the demographic measures and initial levels of risk and protection, neighborhood status had a small but significant positive effect on Time 2 polydrug use and was associated with lower levels of protection at Time 2.

For purposes of clarity, associations among the Time 1 exogenous measures are included in Table 3 (but should be viewed in conjunction with Figure 3). The first three rows of Table 3 contain information related to mean differences in the Time 1 measures of risk, protection, and drug use based on gender, race, and family status. A few of these relations are significant; however, the total proportion of variance accounted for is relatively small. Among the continuous measures of risk, protection, neighborhood risk, and drug use, gender accounted for only one percent of the variance in perceived neighborhood risk. Neighborhood risk was associated with higher psychosocial risk and lower protection, and there was a moderate significant association between Time 1 risk and protection ($r = .62$). Time 1 Polydrug Use was associated significantly both with risk and protection indices as well as the measure of perceived neighborhood risk. Parameterization of repeated measures (not part of Table 3 or included in Figure 4) included correlated residuals for alcohol ($r = .36$, $p < .001$), marijuana ($r = .34$, $p < .001$), and cigarette use ($r = .14$, $p < .01$). Additional model specification included a within-time association between cigarette and marijuana use Time 1 ($r = .19$, $p < .01$). This latter association reflects a small subset of youths, reporting early cigarette and marijuana use, controlling for reported levels of multiple drug use. At Time 2, both risk and protection were moderately and significantly associated (net of all predictions across-time: $r = .37$, $p < .001$), and polydrug use was associated significantly both with risk ($r = .19$, $p < .001$) and protection ($r = -.15$, $p < .01$). Not included for purposes of clarity are longitudinal paths from gender to later cigarette smoking ($\beta = -.10$, $p < .001$) and from early cigarette use to later polydrug use ($\beta = .12$, $p < .05$).

DISCUSSION

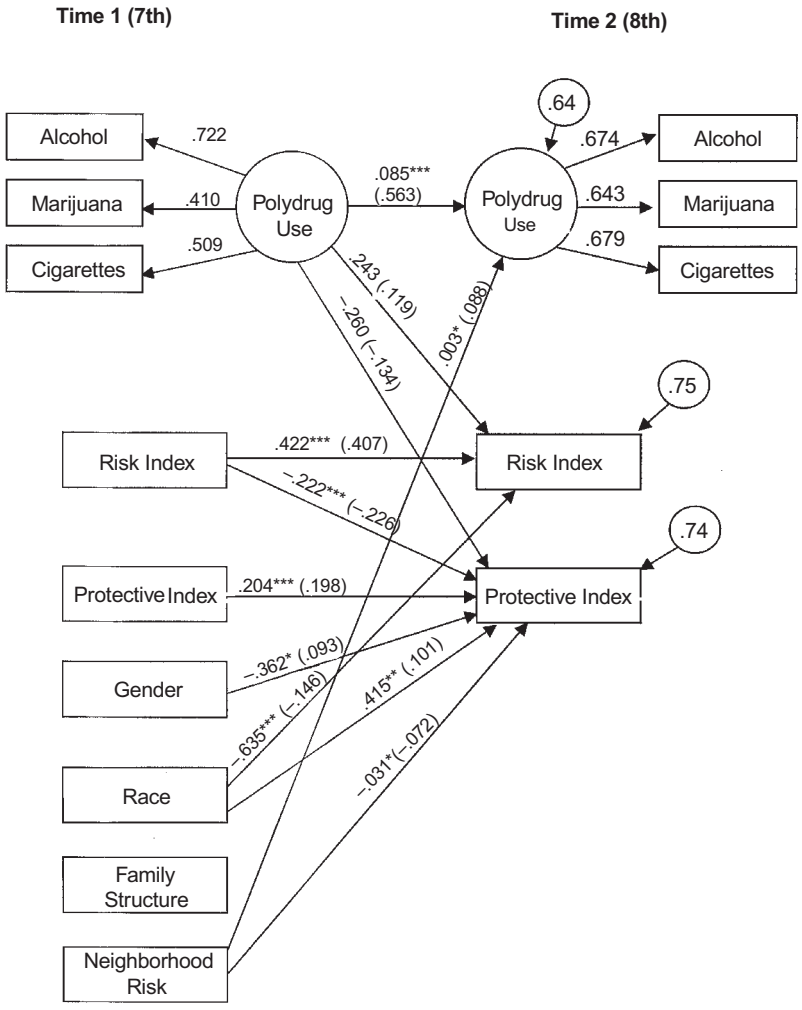
The results of this study indicate that perceived neighborhood risk influences the early stages of drug use among inner-city, ethnic minority youths. The results of the hierarchical models show that, with a few noted exceptions, neighborhood risk uniquely and positively contributed to alcohol, marijuana, and cigarette use, controlling for psychosocial functioning and demographic characteristics. Because many of the measures of psychosocial functioning also contributed uniquely to drug use, it is likely that contextual and individual-level risk factors collectively engender drug use. This finding is consistent with ecological and develop-

TABLE 3. Correlations Among Exogenous (Time 1) Measures from Final Structural Model

	V1	V2	V3	V4	V5	V6	Polydrug-T1
Gender (V1)	1.0	−.111***	.097***	.103**	.102[m]	−.072[m]	–
Race (V2)		1.0	−.095**	–[a]	–	.097**	–
Family Structure (V3)			1.0	−.086*	–2.080*	.073*	–
Neighborhood Risk (V4)				1.0	.269***	−.237***	.242***
Risk Index (V5)					1.0	−.618***	.314***
Protection Index (V6)						1.0	.272***
Polydrug Use-Time 1							1.0

Note. Numbers are point prevalence estimates averaging across the five imputed datasets.
[a] Correlation constrained at zero in final model.
*p ≤ .05, ** p ≤ .01, *** p ≤ .001

FIGURE 3. Results of final SEM depicting effects of cumulative risk, protection, and perceived neighborhood risk on later polydrug use. Model is trimmed with respect to nonsignificant paths; however, final coefficients are adjusted for exogenous covariates. Large circles are latent factors, small circles with numbers inside are residual terms (variances net after prediction), and rectangles are measured (observed) variables.



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

mental-contextual models that stress the importance of macro-level and perceived environmental systems that influence individual development (e.g., Bronfrenbenner, 1989; Jessor & Jessor, 1977). For inner-city ethnic minority youth, the perception of their neighborhoods as filled with tension, fighting, and gang-related activities has a direct, albeit small, influence on their drug use even in the context of important individual-level skills and personal characteristics that can foster resilience.

Moderator analyses also examined whether individual-level factors buffered the adverse effects of perceived neighborhood risk. Only a handful of the individual-level measures moderated the effects of perceived neighborhood risk on drug use. In the models testing alcohol use, high negative affect, peer relations, and high social concern all buffered the impact of perceived neighborhood risk on alcohol use. In the context of the current study, social concern assessed interpersonal anxiety and social self-esteem, negative affect assessed irritability, anxiousness, and agitation, and peer relations assessed (lack of) perceived instrumental support and comfort provided by friends. The ability of all three measures to moderate the influence of neighborhood risk reinforces that social skills and interpersonal relations play an instrumental role in the early stages of drug use. For instance, during early adolescence, high social concern and anxiety may dampen the acquisition of age-appropriate social skills. In other words, deficits in social skills may interfere with normal peer relations and diminish opportunities for some youths to establish successful peer-bonds. Poor social competence and inadequate peer relations can set into motion a downward drift leading to disenfranchisement from important peer networks. The cumulative effect of peer neglect and feelings of self-abnegation may foster distress and negative affect.

Socially anxious youths fear new encounters, find friendships difficult to establish, and dislike experiences that focus attention on them. One possible mechanism to account for the observed buffering effects is that socially incompetent youths withdraw from peer interactions and close themselves off from important socializing experiences. Peers are extremely influential in the early stages of adolescent drug use (e.g., Kandel, 1986), and the absence of a strong peer network may limit opportunities for socially anxious youths to observe vicariously or model directly alcohol use. Socially efficacious youths, on the other hand, experience positive regard from their peers and these high levels of peer support combined with interpersonal mastery may serve to facilitate entry into alcohol-abusing peer networks.

Risk-taking (i.e., conventional behavior) and perceived parental support reduced the negative impact of neighborhood risk on marijuana use. At higher levels of perceived neighborhood risk, youths reporting low levels of risk-taking reported less marijuana use than youths reporting comparably higher levels of risk-taking. In the present study, risk-taking was the most efficient predictor and accounted for the largest proportion of variance in all three of the drug types. One possible mechanism through which risk-taking may heighten the effects of neighborhood risk is by interfering with school-related learning processes. The inability to stay focused on school-related tasks coupled with their lagging academic performance may encourage impulsive youths to select deviant and drug-abusing peer networks (e.g., Newcomb & McGee, 1991; Wills et al., 1994). Through processes of peer socialization and driven by motives for self-acceptance, these youths begin to acquire the behavioral norms of a new and more deviant peer network (e.g., Kaplan, 1980).

At increasingly high levels of perceived neighborhood risk, poor parental communication and low parental support was associated with high levels of marijuana use. Plots of these interactions showed that the rate of ascent for the high parental risk group was much steeper than either the medium or low parental risk group, although positive slopes characterized regression lines for all three groups. Poor parental support indicated families that neither support the adolescents' decisions nor included them in family discussion. Poor communication and poor family relations can prompt some youths to sever family ties and seek a safe haven hanging around with friends in the streets. Spending more time outside of the family in high-risk neighborhoods inadvertently exposes them to drug use and increases the opportunities for these youths to observe vicariously negative adult role models (e.g., drug dealers). All told, the moderator analyses highlight the important role of family and peers in the beginning stages of adolescent drug use.

The longitudinal multivariate model presents a unique opportunity to refine our current understanding of relations between perceived contextual factors, individual-level risk, and early-stage drug use. First, early risk and multiple drug use were moderately stable over the one-year period. Protection, on the other hand, showed less stability and did not contribute to any of the 8th grade risk or drug use outcomes. Adolescence is a period of developmental flux and many of the skills and personal factors that comprise the risk/protective indices undergo considerable change during this period. The relatively low stability for the protection indices may reflect rapid maturational processes for the skills underly-

ing resilience. In contrast, the index of risk was moderately stable and contributed uniquely to the 8th grade outcomes including drug use and lowered protection.

Early drug use also contributed to less protection and greater psychosocial dysfunction over a one-year period. In addition to the prospective effects of risk and drug use, youth who perceived their neighborhood as unsafe, replete with gangs, and filled with tension and fighting reported less psychosocial protection and higher levels of multiple drug use. The combined relations between risk, protection, perceived neighborhood risk and drug use suggest several important directions for current drug abuse prevention approaches. First, the magnitude of association between neighborhood risk and the cumulative risk and protection indices was equivalent at Time 1. The lack of a clear distinction between features of psychosocial risk and protection and neighborhood risk suggests the possibility that interventions can focus on implementing both risk reduction and protection enhancing strategies to lessen the adverse effects associated with high-risk environments. In addition to the early activity of protection, there were more numerous significant paths from Time 1 measures to Time 2 protection than to Time 2 risk (including neighborhood risk). The increased activity surrounding protection at Time 2 highlights the increased developmental prominence of resiliency at this age. In fact, when coupled with the low stability of protection over time, it is apparent that protective mechanisms are under rapid development in the early portions of adolescence, but becoming linked to drug use. In response to the differing roles of risk and protection, it is possible that prevention efforts to reduce the impact of stressful environments can gain appreciably more if they focus on enhancing protection to offset risk, rather than focus solely on reducing individual-level risk.

With a few notable differences, males and females were equally likely to report being at risk or protected for a wide range of psychosocial measures. Females were more likely to be at risk for negative affect and negative life events. The measure of negative affect used in the present study assesses mood and irritability and may, in fact, overlap with elements of depressive symptomatology. In this respect, the elevated levels of negative affect reported by females may instrumentally highlight biological and pubertal changes consistent with menarche and a vulnerability to depression (e.g., Nolem-Hoeksema & Girgus, 1994). Males reported elevated levels of cumulative risk and females reported elevated levels of protection. Coupled with their elevated levels of psychosocial risk, male students were also more likely to perceive their neighborhood as

tense, gang-oriented, and dangerous and report higher levels of drug use compared to female students. Differential risk status based on gender highlights the need to consider early socialization experiences as part of the overall set of risk conditions that foster early stage drug use. It is essential, then, to capture additional features of gender-specific identity processes and determine if prevention efforts can benefit high-risk youths on the basis of these socialization experiences.

Several additional pieces of information should be considered with respect to interpreting the findings of the present study. Race comparisons showed that Hispanic youths were at greater risk for drug use but were less likely to dropout from the study. Attrition analyses established that drug use was higher among youths not remaining in the panel sample. National data show that attrition rates are higher for Hispanic youths and for males (United States Department of Education, 1996); however, national statistics reflect dropout rates that commence with the 9th grade and assessment of the students in the current study occurred at an earlier age. Rates of drug use varied widely across the three substances, with alcohol reported as the most prevalent and marijuana the least prevalent drug used by the present sample. Two factors can offset the evidence of limited bias in the panel sample. First, despite a loss of high-end drug users (who were primarily African-American) across the one-year period, the proportion of drug users in the panel sample increased over the one-year period. Second, in addition to a sheer increase in the number of drug users, the reported levels of drug use increased significantly from baseline to follow-up. There also was evidence of differential attrition because one school refused to participate in the follow-up portion of the study. However, a series of analyses ruled out any systematic differences between the retained youths, those responding to the survey by mail, and nonrespondents unavailable follow-up. Thus, the final panel sample was deemed to be representative of school-based ethnic minority youths who are exposed to the vicissitudes of inner-city life.

Limitations of the Study

There are several important limitations to the present study worth noting. First, the measure of neighborhood risk contained only a few items tapping perceived trouble, tension, and gang activity. Other researchers used more extensive sets of items to assess experiential and contextual factors (e.g., Dembo et al., 1985; Crum et al., 1996). Inclusion of a more variegated set of items is required to tap domains related to physi-

cal decay (run-down housing), homelessness, drug dealing, and elements of social disorganization (residential instability and unemployment). In a related vein, the relatively small effect size associated with the influence of neighborhood risk on subsequent drug use and protection (< .10) encourages further examination of additional measures of census-based and experiential factors that may influence drug use. Future investigations may want to broaden both the measurement of neighborhood risk, as well as include additional socioeconomic indicators to provide a more complete understanding of factors related to social disorganization that influence drug use.

Along these same lines, the moderately low reliability for several of the psychosocial measures may hinder detecting their true effects on drug use. The decision to abbreviate several well-known and validated measures of psychosocial functioning was made in part to increase the range of measures assessed while still maintaining a survey length reasonable for administration in a classroom setting. Low reliability for some of these measures may have contributed to the large residual variances in the regression models but was hopefully attenuated in the structural portion of the analyses. One other factor that needs to be considered in the process of validating etiologic models with ethnic minority youths is the cultural appropriateness of these measures. Further studies are warranted that identify barriers in survey administration, clarify item face validity, and determine empirically whether response burden may have contributed to the low reliabilities for some of the measures.

The present study included tests of moderation that focused on a limited set of personal factors (i.e., skills) and measures of intrapersonal functioning (e.g., risk-taking). It is worth noting that the effects of neighborhood risk were moderated primarily by measures of intrapersonal functioning (e.g., risk-taking, negative affect, family relations risk). Measures of competence and individual-level skills did not attenuate significantly the effect of neighborhood risk (though the measures of skills and competence independently predicted drug use). Analyses of the long-term effects of risk and protection included a limited set of social and personal competence skills. Future studies should broaden the scope of inquiry and examine the effects of a wider range of skills and competencies to learn more about how risk and resiliency contribute to drug use.

Age also may play a factor in why so few measures of skills and psychosocial functioning moderated the effects of neighborhood risk. Seidman et al. (1998), for example, reported age differences in rates of

antisocial behavior as well as age differences in the magnitude of relations between structural and experiential factors and antisocial behavior. The present study examined the effects of perceived experiential factors on a cohort of inner-city youths in the 7th grade. It may very well be that contextual factors that influence drug use are more pronounced for older youths or that skills are more developmentally stable among older youths. Older youths may spend more free time outside of school and experience less supervision from family members. The increase in free time and the absence of adult authority can provide opportunities for engaging with drug-abusing peers. Age also may factor into gang membership, which may be more established with older youths and less available to middle school students. Future studies may want to examine the effects of experiential factors on drug use in older cohorts and specifically test explanatory models that focus on developmentally appropriate contextual issues (e.g., employment opportunities).

In addition to these select conceptual issues, data transformations (i.e., centering) were used with the tests for moderation; however, the overall proportion of variance accounted for by the interaction terms was relatively small. This is a common statistical artifact encountered with tests for interactions conducted with nonexperimental data (McClelland & Judd, 1993). With additional information regarding the precise mechanisms by which one variable moderates the effects of another, researchers will be more inclined to outline specifically the zone or region of interaction and as a result promote more precise statistical tests. Nevertheless, the current study reinforces that certain individual-level factors moderate the effect of neighborhood risk on drug use and that the perceptions of their contextual neighborhood shared by ethnic minority youths independently contributes to increased drug use and lowered protection over a one-year period.

NOTES

1. It should be noted that the psychometric properties of the SIQYA were established based on three suburban and predominately white samples participating in a longitudinal study of mental health. The SIQYA represents a refinement of the 130-item Offer Self-Image Questionnaire (OSIQ: Offer et al., 1982), which has seen considerable diagnostic application with clinical and referred adolescent (ages 14-18) populations. A considerably larger number of items were used in the parent study for each of the two subscales (10 for peer relations and 17 for family relations), which may have contributed to the larger reported estimates of internal consistency. Moreover, the response

format was modified, scale length shortened, and several items modified to comport with the goals of the present study.

2. Tests for three-way interactions with race, gender, and family status all proved to be nonsignificant and these terms were dropped from further analyses.

3. At Time 1, 50% of the cases had complete data with another eight percent having only one missing value and five percent had at most two missing values. At Time 2 (panel sample), 70% of the cases had complete data, six percent had at most one missing, and three percent had at most two missing. Shafer (1997) provides a formula for determining the number of imputed datasets required to obtain efficient point prevalence estimates.

4. According to Rubin (1987), there is only a 1% gain in efficiency of estimates when the number of imputations increases from 5 to 10 and the fraction of missingness is estimated between 5% and 10% (which approximates the actual level of variable missingness in the present study). With respect to mechanisms potentially contributing to missing data, a main assumption of imputation procedures is that the data is missing at random and that reasons for missingness is part of the observed data and is not part of the missing data structure. Thus, we included grades, risk-taking, and absenteeism in the imputation procedure, especially because these measures can contribute to survey completion rates.

5. Further analyses examined whether neighborhood risk interacted with either risk or protection at Time 1. Inclusion of an interaction term suggests that the effects of neighborhood risk on later drug use are contingent on levels of cumulative risk or protection. Neither set of interaction terms proved significant in models tested separately for alcohol, marijuana, and cigarettes. Therefore, these terms were not included in the final multivariate model.

6. Five respective sets of fit indices were obtained for the five imputed data sets: Model 1 = $\chi^2(46) = 67.83$, $p = .02$, CFI = .990, RMSR = .027, and RMSEA = .024; Model 2 = $\chi^2(46) = 73.89$, $p = .005$, CFI = .988, RMSR = .027, and RMSEA = .024; Model 3 = $\chi^2(46) = 84.73$, $p < .001$, CFI = .983, RMSR = .026, and RMSEA = .033; Model 4 = $\chi^2(46) = 80.58$, $p = .001$, CFI = .985, RMSR = .026, and RMSEA = .031; and Model 5 = $\chi^2(46) = 87.89$, $p < .001$, CFI = .982, RMSR = .029, and RMSEA = .034.

REFERENCES

Aiken L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. Newbury Park, CA: Sage Publications.

Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The Hopelessness Scale. Journal of Consulting and Clinical Psychology, 42, 861-865.

Bentler, P. M. (1995). EQS structural equations program manual. Encino, CA: Multivariate Software, Inc.

Blount, W. R., & Dembo, R. (1984). The effect of perceived neighborhood setting on self-reported tobacco, alcohol, and marijuana use among inner-city minority junior high school youth. The International Journal of the Addictions, 19, 175-198.

Bronfrenbenner, U. (1989). Ecological systems theory. In R. Vasta (Ed.), Annals of child development–six theories of child development: Revised formulations and current issues (pp. 1-103). Greenwich, CT: JAI.

Brook, J. S., Nomura, C., & Cohen, P. (1989). A network of influences on adolescent drug involvement: Neighborhood, school, peer and family. Genetic, Social, and General Psychology Monographs, 115, 125-145.

Brooks-Gunn, J., Duncan, G., & Aber, J. L. (Eds.). (1997). Neighborhood poverty: Context and consequences for children (Volume 1). Policy implications in studying neighborhoods (Volume 2). New York: Russell Sage Foundation Press.

Brooks-Gunn, J., Duncan, G. J., Klebanov, K., & Sealand, N. (1993). Do neighborhoods influence child and adolescent development? American Journal of Sociology, 99, 353-394.

Bureau of Labor Statistics, Division of Labor Force Statistics (1998). Current population survey, employment status of civilian noninstitutional population–1997 (Unpublished tabulation). Washington, DC: Author.

Chou, C.-P., & Bentler, P. M. (1990). Model modification in covariance structure modeling: A comparison among likelihood ratio, Lagrange multiplier, and Wald tests. Multivariate Behavioral Research, 25, 115-136.

Clayton, R. (1992). Transitions in drug use: Risk and protective factors. In M. Glantz & R. Pickens (Eds.), Vulnerability to drug abuse (pp. 15-51). Washington, DC: American Psychological Association.

Cohen, S., & Hoberman, H. (1983). Positive events and social supports as buffers of life change stress. Journal of Applied Social Psychology, 13, 99-125.

Conger, R. D., Conger, K. J., Elder, G. H., Lorenz, F. O., Simones, R. L., & Whitebeck, L. B. (1993). Family economic stress and adjustment of early adolescent girls. Developmental Psychology, 29, 206-219.

Crum, R. M., Lillie-Blanton, M., & Anthony, J. C. (1996). Neighborhood environment and opportunity to use cocaine and other drugs in late childhood and early adolescence. Drug and Alcohol Dependence, 43, 155-161.

Crumbaugh, J. C., & Maholick, L. T. (1964). An experimental study in existentialism: The psychometric approach to Frankl's concept of noogenic neurosis. Journal of Clinical Psychology, 20, 200-207.

Dembo, R., Blount, W. R., Schmeidler, J., & Burgos, W. (1986). Perceived environmental drug use risk and the correlates of early drug use or nonuse among inner-city youths: The motivated actor. The International Journal of the Addictions, 21, 977-1000.

Dembo, R., Farrow, N., Allen, J., Schmeidler, J., & Burgos, W. (1985). A causal analysis of early drug involvement in three inner-city neighborhood settings. International Journal of the Addictions, 20, 1213-1237.

Department of Health and Human Services (1986). Secretary's Task Force on Black and Minority Health: Vol 7. Chemical dependency and diabetes (Pub. No. 241-280/05310). Washington, DC: U. S. Government Printing Office.

Department of Justice, Bureau of Justice Statistics. (1997). Criminal victimization in the United States (NCJ Publication No. 162126). Washington, DC: Superintendent of Documents, Government Printing Office.

Dornbusch, S. M., Carlsmith, J. M., Bushwall, S. J., Ritter, P. L., Leiderman, H., Hastort, A. H., & Gross, R. T. (1985). Single-parents, extended households, and the control of adolescents. Child Development, 56, 326-341.

Douglass, F. M., & Khavari, K. A. (1982). A major limitation of the percentile index of overall drug use indulgence. The International Journal of the Addictions, 17, 283-294.

Dunlap, W. P., & Kemery, E. R. (1987). Failure to detect moderating effects: Is multicollinearity the problem? Psychological Bulletin, 102, 418-420.

Durant, R. H., Cadenhead, C., Pendergrast, R. A., Slavens, G., & Linder, C. W. (1994). Factors associated with the use of violence among urban Black adolescents. American Journal of Public Health, 84, 612-617.

Ennett, S. T., Flewelling, R. L., Lindrooth, R. C., & Norton, E. C. (1997). School and neighborhood characteristics associated with school rates of alcohol, cigarette, and marijuana use. Journal of Health and Social Behavior, 38, 55-71.

Eysenck, H. J., & Eysenck, S. B. G. (1975). Manual of the Eysenck personality questionnaire. London: Hodder & Stoughton.

Farrell, M. P., Barnes, G. M., & Banerjee, S. (1995). Family cohesion as a buffer against the effects of problem-drinking fathers on psychological distress, deviant behavior, and heavy drinking in adolescence. Journal of Health and Social Behavior, 36, 377-385.

Félix-Ortiz, M., & Newcomb, M. D. (1992). Risk and protective factors for drug use among Latino and White adolescents. Hispanic Journal of Behavioral Sciences, 14, 291-309.

Fleming, J. S., & Watts, W. A. (1982). The dimensionality of self-esteem. Journal of Personality and Social Psychology, 39, 921-929.

Flewelling, R. L., & Bauman, K. E. (1990). Family structure as a predictor of initial substance use and sexual intercourse in early adolescence. Journal of Marriage and the Family, 52, 171-181.

Gottfredson, D. C., McNeil, R. J., & Gottfredson, G. D. (1991). Social area influences on delinquency: A multilevel analysis. Journal of Research on Crime and Delinquency, 28, 197-226.

Graham, J. W., Hofer, S. M., & MacKinnon, D. P. (1996). Maximizing the usefulness of data obtained with planned missing value patterns: An application of maximum likelihood procedures, Multivariate Behavioral Research, 31, 197-218.

Hammond, W. R., & Yung, B. (1993). Psychology's role in the public health response to assaultive violence among young African-American men. American Psychologist, 48, 142-154.

Herd, D. (1994). Predicting drinking problems among black and white men: Results from a national survey. Journal of Studies on Alcohol, 55, 61-71.

Jessor, R., & Jessor, S. L. (1977). Problem behavior and psychosocial development: A longitudinal study of youth. New York: Academic Press.

Johnson, J. H., & McCutcheon, S. (1980). Assessing life stress in older children and adolescents: Preliminary findings with Life Events Checklist. In I. G. Sarason & C. D. Spielberger (Eds.), Stress and Anxiety: Vol. 7 (pp. 111-125). Washington, DC: Hemisphere.

Jones-Webb, R., Snowden, L., Herd, D., Short, B., & Hannan, P. (1997). Alcohol-related problems among Black, Hispanic and White men: The contribution of neighborhood poverty. Journal of Studies on Alcohol, 58, 539-545.

Kadushin, C., Reber, E., Saxe, L., & Livert, D. (1998). The substance use system: Social and neighborhood environments associated with substance use and misuse. Substance Use and Misuse, 33, 1681-1710.

Kandel, D. B. (1986). Processes of peer influences in adolescence. In R. K. Silbereisen, K. Eyferth, & G. Rudinger (Eds.), Development as action in context: Problem behavior and normal youth development (pp. 203-228). New York: Springer-Verlag.

Kaplan, H. B. (1980). Deviant behavior in defense of self. New York: Academic Press.

Klein, J. D., Slap, G. B., Elster, A. B., & Schonberg, S. K. (1992). Access to health care for adolescents: A position paper of the Society for Adolescent Medicine. Journal of Adolescent Health, 13, 162-170.

Klerman, L. V. (1993). The influence of economic factors on health-related behaviors in adolescents. In. S. G. Millstein, A. C. Petersen, & E. O. Nightingale (Eds.), Promoting the health of adolescents: New directions for the 21st century (pp. 38-57). New York: Oxford University Press.

Komro, K. A., Flay, B. R., Hu, F. B., Zelli, A., Rashid, J., & Amuwo, S. (1998). Urban pre-adolescents report perceptions of easy access to drugs and weapons. Journal of Child & Adolescent Substance Abuse, 8, 77-89.

Langner, T. S. (1962). A twenty-two item screening score of psychiatric symptoms indicating impairment. Journal of Health and Human Behavior, 3, 269-276.

MacCallum, R. (1986). Specification searches in covariance structure modeling. Psychological Bulletin, 100, 107-120.

Marshall, G. N. (1991). A multidimensional analysis of internal health locus of control belief: Separating the wheat from the chaff? Journal of Personality and Social Psychology, 61, 483-491.

McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. Psychological Bulletin, 114, 376-389.

National Center for Health Statistics. (1993). Health, United States, 1992. Hyattsville, MD: Public Health Service.

Newcomb, M. D., & Bentler, P. M. (1988). Consequences of adolescent drug use: Impact on the lives of young adults. Newbury Park, CA: Sage Publications.

Newcomb, M. D., Huba, G. J., & Bentler, P. M. (1981). A multidimensional assessment of stressful life events among adolescents: Derivation and correlates. Journal of Health and Social Behavior, 22, 400-415.

Newcomb, M. D., & McGee, L. (1991). Influence of sensation seeking on general deviance and specific problem behaviors from adolescence to young adulthood. Journal of Personality and Social Psychology, 61, 614-628.

Nolem-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. Psychological Bulletin, 115, 424-443.

Paschall, M. J., & Hubbard, M. L. (1998). Effects of neighborhood and family stressors on African American male adolescents' self-worth and propensity for violent behavior. Journal of Consulting and Clinical Psychology, 66, 825-831.

Paulhus, D. (1983). Sphere-specific measures of perceived control. Journal of Personality and Social Psychology, 44, 1253-1265.

Petersen, A. C., Schulenberg, J. E., Abramowitz, R. H., Offer, D., & Jarcho, H. D. (1984). A Self-Image Questionnaire for young adolescents (SIQYA): Reliability and validity studies. Journal of Youth and Adolescence, 13, 93-111.

Pierce, R. S., Frone, M. R., Russell, M., & Cooper, M. L. (1996). Financial stress, social support, and alcohol involvement: A longitudinal test of the buffering hypothesis in a general population survey. Health Psychology, 15, 38-47.

Robinson, W. S. (1950). Ecological correlations and the behavior of individuals. American Sociological Review, 15, 351-357.

Rubin, D. B. (1987). Multiple imputation for nonresponse in surveys. New York: John Wiley and Sons.

Sarason, I. G., Johnson, J. H., & Siegel, J. M. (1978). Assessing the impact of life changes: Development of the Life Experiences Survey. Journal of Consulting and Clinical Psychology, 46, 932-946.

Schafer, J. L. (1997). Analysis of incomplete multivariate data. London: Chapman & Hall.

Scheier, L. M., Botvin, G. J., & Miller, N. L. (1999). Life events, neighborhood stress, psychosocial functioning, and alcohol use among urban minority youth. Journal of Child & Adolescent Substance Abuse, 9, 19-50.

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, 49-82.

Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R. W. (1982). The Self-Efficacy Scale: Construction and validation. Psychological Reports, 51, 663-671.

Seidman, E., Yoshikawa, H., Roberts, A., Chesir-Teran, D., Allen, L., Friedman, J. L., & Aber, J. L. (1998). Structural and experiential neighborhood contexts, developmental stage, and antisocial behavior among urban adolescents in poverty. Development and Psychopathology, 10, 259-281.

Selnow, G. W. (1987). Parent-child relationships and single and two parent families: Implications for substance usage. Journal of Drug Education, 17, 315-326.

Simcha-Fagan, R., & Schwartz, J. E. (1986). Neighborhood and delinquency: An assessment of contextual effects. Criminology, 24, 667-703.

Simon, T. R., Stacy, A. W., Sussman, S., & Dent, C. W. (1994). Sensation seeking and drug use among high risk Latino and Anglo adolescents. Personality and Individual Differences, 17, 1083-1090.

Smart, R. G., Adlaf, E. M., & Walsh, G. W. (1994). Neighborhood socio-economic factors in relation to student drug use and programs. Journal of Child & Adolescent Substance Abuse, 3, 37-46.

Spencer, M. B. (1985). Cultural cognition and social cognition as identity correlates of Black children's personal-social development. In M. B. Spencer, G. K. Brookins, & W. R. Allen (Eds.), Beginnings: The social and affective development of Black children (pp. 215-230). Hillsdale, NJ: Lawrence Erlbaum.

Spencer, M. B., Cole, S. P., Dupree, D., Glymph, A., & Pierre, P. (1993). Self-efficacy among urban African American early adolescents: Exploring issues of risk, vulnerability, and resilience. Development and Psychopathology, 5, 719-739.

Spencer, M. B., Cunningham, M., & Swanson, D. P. (1995). Identity as coping: Adolescent African-American males' adaptive responses to high-risk environments. In H. W. Harris, H. C. Blue, & E. H. Griffith (Eds.), Racial and ethnic identity: Psychological development and creative expression (pp. 31-52). New York: Routledge.

Spencer, M. B., Swanson, D. P., & Glymph, A. (1996). The prediction of parental psychological functioning: Influence of African American adolescent perceptions and experiences of context. In C. D. Ryff & M. M. Seltzer (Eds.), The parental experience in midlife (pp. 337-380). Chicago, IL: University of Chicago Press.

Strickland, B. R. (1978). Internal-external expectancies and health-related behaviors. Journal of Consulting and Clinical Psychology, 46, 1192-1211.

United States Bureau of the Census (1996). Current population reports, Series P-25-1130. Washington, DC: U.S. Government Printing Office.

United States Department of Education. National Center for Education Statistics. (1996). Dropout rates in the United States: 1994, NCES 96-863. Washington, DC: Government Printing Office.

Veit, C. T., & Ware, J. E., Jr. (1983). The structure of psychological distress and well-being in general populations. Journal of Consulting and Clinical Psychology, 51, 730-742.

Wills, T. A. (1986). Stress and coping in early adolescence: Relationships to substance use in urban school samples. Health Psychology, 5, 503-529.

Wills, T. A., Vaccaro, D., & McNamara, G. (1994). Novelty seeking, risk taking, and related constructs as predictors of adolescent substance use: An application of Cloninger's theory. Journal of Substance Abuse, 6, 1-20.