

Adolescent Substance Use: Preliminary Examinations of School and Neighborhood Context¹

Kevin W. Allison²

Virginia Commonwealth University

Isiaah Crawford

Loyola University

Peter E. Leone and Edison Trickett

University of Maryland, College Park

Alina Perez-Febles, Linda M. Burton, and Ree Le Blanc

The Pennsylvania State University

In considering the influences of microsystems on adolescent substance use, familial and peer contexts have received the most extensive attention in the research literature. School and neighborhood settings, however, are other developmental contexts that may exert specific influences on adolescent substance use. In many instances, school settings are organized to provide educational services to students who share similar educational abilities and behavioral repertoires. The resulting segregation of students into these settings may

¹The present work was funded by Grant # GOO8530284 from the Office of Special Education and Rehabilitative Services, United States Department of Education awarded to the third author and by grants to the first author from the William T. Grant Foundation, College of Liberal Arts Office of Research, Office of Minority Faculty Development, and Center for the Study of Child and Adolescent Development PRIDE Project, Penn State University, and to the sixth author from the William T. Grant Foundation and a First Award from the National Institute of Mental Health (No. R29 MH46057-01).

²All correspondence should be sent to Kevin W. Allison, 808 W. Franklin Street, Room 402, Department of Psychology, Box 842018, Virginia Commonwealth University, Richmond, Virginia, 23284-2018.

result in different school norms for substance use. Similarly, neighborhood resources, including models for substance use and drug sales involvement, may play an important role in adolescent substance use. We briefly review literature examining contextual influences on adolescent substance use, and present results from two preliminary studies examining the contribution of school and neighborhood context to adolescent substance use. In the first investigation, we examine the impact of familial, peer, and school contexts on adolescent substance use. Respondents were 283 students (ages 13 to 18) from regular and special education classrooms in six schools. Although peer and parental contexts were important predictors of substance use, school norms for drug use accounted for variance in adolescent use beyond that explained by peer and parental norms. Data from a second study of 114 adolescents (mean age = 15) examines neighborhood contributions to adolescent substance use. In this sample, neighborhood indices did not contribute to our understanding of adolescent substance use. Implications for prevention are presented.

KEY WORDS: substance use; adolescent; school; neighborhood.

A substantial body of research attests to the importance of peer and familial contexts in understanding adolescent substance use. From an ecological perspective, these settings represent microsystems, environments within which adolescents are directly involved that may affect the adolescent's development (Bronfenbrenner, 1986; Bronfenbrenner, Moen, & Garbarino, 1984). Parental and peer microsystems are clearly important to our understanding of adolescent drug use; however, two other developmental microsystems, school and neighborhood contexts, while conceptually important in children's and adolescents' development, have received considerably less attention as potential influences on adolescent substance use. The present research provides a preliminary examination of the role of all four microsystems in understanding adolescent substance use, focusing specifically on the contributions of school and neighborhood context to adolescent alcohol and other drug involvement.

Family, Parental, and Peer Contexts

In considering the contributions of the social context to adolescent substance use, investigators have documented that adolescents in families with members who use cigarettes, alcohol, or drugs are more likely to become involved in substance use than adolescents who live in families where the members are nonusers (Brooks, Lukoff, & Whiteman, 1977; Denton & Kampfe, 1994; O'Connell *et al.*, 1981; Pressons *et al.*, 1984). Kandel (1978) reported that parents are important models in an adolescent's initiation into

alcohol use (Kandel & Andrews, 1987) and that parental factors play an important role in illicit adolescent drug use other than marijuana (Kandel, Kessler, & Margulies, 1978; see also Segal & Stewart, 1996). Work by Stephenson, Henry, and Robinson (1996) found maternal substance use to be the most predictive factor in adolescent drug experimentation and use. Research has further suggested that other parental factors have a significant impact on the formation of adolescent attitudes and behaviors regarding drug use (Coombs, 1988; Coombs & Landsverk, 1988). A number of studies have revealed an association between parental illegal drug use and poor parental monitoring as influences on initial drug exploration and adolescent drug use (Denton & Kampfe, 1994; Dishion, Patterson, & Reid, 1988; Fawzy, Coombs, & Gerber, 1983; Gorusch & Butler, 1976; Kandel *et al.*, 1978), suggesting that the influence of parental substance use behavior on adolescent use may be mediated by parenting (e.g., family management) practices. Indices of the quality of parenting (e.g., authoritarian parenting style, perceived support, parental monitoring, and parent-adolescent communication), are also direct predictors of problem behaviors during adolescence, including heavy drinking and drunkenness (Barnes, Farrell, & Banerjee, 1994; Mounts & Steinberg, 1995). Research from a family systems perspective implies that alcohol use by adolescents may evolve out of a lack of attachment or commitment to the family (Protinsky & Shilts, 1990). Youth who have close, nonauthoritarian relationships with their parents are reported to be less likely to become involved with drugs and less likely to associate with drug using peers (Barnea, Teichman, & Rahav, 1992; Barnes *et al.*, 1994; Coombs, Paulson, & Richardson, 1991; Elliot, Hui-zinga, & Ageton, 1982; Foxcroft & Lowe, 1995; Kandel & Andrews, 1987; Martin & Pritchard, 1991). J. E. Mayer (1980) similarly suggested that adolescents who use alcohol heavily desire to distance themselves from their families, which results in inappropriate peer involvement.

Research also suggests that peer contexts have a significant impact on adolescent drug use (Barnes & Welte, 1986; Blount & Dembo, 1984; Chassin, 1984; Jessor & Jessor, 1978; O'Connell *et al.*, 1981). Studies have indicated that adolescents who engage in heavy substance use have been found to seek support from peers, rather than their parents (Wills & Vaughn, 1989) and to spend more time with friends than family (Shilts, 1991). Similarly, Dishion and colleagues (Dishion *et al.* 1988; Dishion, Capaldi, Sprackelen, & Li, 1995) have found that early exploration of drugs is linked to having "deviant" peers; which, they report, is linked to poor parental monitoring as indicated above. Association with drug using peers, including siblings, provides easy access to drugs and models of drug use behavior, and is linked to higher rates of drug use (Huba, Wingard, & Bentler, 1979; Kandel & Andrews, 1987; Needle *et al.*, 1986).

School Context

Although not examined with the frequency of familial and peer contexts, the school microsystem may have an impact on adolescent drug use in multiple ways. Schools may vary in rates of “normative” use of substances, in the access they provide to drugs, and in the types and quantity of peer drug use models. Variability across school settings that differ in structure, goal, and/or student population, may be particularly broad. For example, students who receive special educational services for learning, behavioral, or emotional problems may receive instruction in a mainstreamed setting (i.e., the students receive most of their instruction within the regular curricula and in classes with their peers), they may be placed in self-contained classrooms³ within a regular school, or they may attend a school designed exclusively for students experiencing similar problems. Available research has suggested that peer relationships may be particularly influential in the alcohol and drug use of youth who have been identified with cognitive (Huang, 1981) and/or behavioral problems (Clements & Simpson, 1978). With their segregation into treatment programs or special school placements, adolescents with emotional, behavioral, or learning challenges may come into more frequent contact with deviant peers. In the face of normative early adolescent increases in conformity and with their separation from traditional peer groups, youth in special educational settings may have a heightened need to belong and therefore, may be more susceptible to peer influence. While it could be argued that the measurement of drug use in the peer context serves as a proxy for rates of school use, research has most frequently measured peer influence based on drug use in proximal relationships (e.g., drug use of friends; see Kandel, 1978), as opposed to rates of use in the broader or more distal school environment.

To date, few studies have examined the impact of the school environment on adolescent substance use. Members of the present research group (Leone, Greenburg, Trickett, & Spero, 1989) found students identified as behaviorally disordered and served in special schools had higher levels of substance use than youths in regular education programs or students receiving special educational services in the regular public school setting. Elmquist, Morgan, and Bolds (1992) reported that behaviorally disordered students in self-contained classrooms reported higher rates of alcohol and drug use than nondisabled students, learning-disabled students, behavior-

³Participants in the “self-contained” classrooms have been identified as having either a learning or behavior disorder, and some have both, which are sufficiently severe to require a more restrictive learning environment. Their disorders are not so severe as to require placement outside the public school setting. These students are placed in settings with smaller class sizes and take their courses exclusively with other students in the special education curriculum.

ally disturbed students described as less aggressive, and behaviorally disordered students not in self-contained classrooms.

Evidence relevant to the role of educational settings in understanding adolescent substance use is also available from several research groups that have studied drug and alcohol use in the context of prevention programs and perceived school environments. Hansen and Graham (1991) examined the efficacy of two techniques design to prevent substance abuse among junior high school students at 12 schools in Southern California. They found that refusal skills training (i.e. "just saying no") was not successful, but that a normative education program designed to correct erroneous perceptions about prevalence and acceptability of substance abuse among students in their school was effective in preventing alcoholism, marijuana, and tobacco use. Similarly, Botvin, Botvin, Baker, Dusenbury, and Goldberg (1992) examined the relationships between adolescents' perceived prevalence of tobacco use by school peers and adults in relation to their own tobacco use. Both cross-sectional and longitudinal analyses suggested that students who perceived more than half of all adults or their peers smoked cigarettes were most likely to smoke or to initiate smoking over a 2-year period. These studies suggest that students' perceptions of the prevalence or acceptability of alcohol or other drug use in both school and broader peer contexts, influences drug use. Raskin, Novacek, and Hogan (1992) examined the relationship between knowledge of drug culture and actual use among rural middle and high school students. They found that knowledge of drug use was related to drug use, particularly among older students. Knowledge of drug use, Raskin *et al.* suggest, indicates identification and participation in a drug culture. As there are few studies focusing specifically on actual rates of alcohol and other drug use across specific school contexts, the research literature examining adolescent drug use among populations likely to receive special educational services is available to further assist in developing hypotheses about this possible relationship (Leone, 1991). This literature includes research focusing on individuals with mental retardation, juvenile delinquents, and adolescents with identified emotional disturbance.

Huang (1981) reported that students identified as educable mentally retarded (EMR) showed lower rates of drinking over the past year than their non-EMR peers; however, EMR students were overrepresented among frequent users. Zetlin (1985), in collecting retrospective interview data on adolescent behavior disturbance from mentally retarded adults and their families, found that 8% indicated their use of alcohol or drugs to be "problematic."

In addition, research examining delinquency has found an association between a youth's adjudication and their substance use. Blane (1983) reported that there were almost twice as many problem drinkers among a 13-

to 18-year-old sample of 55 delinquents (67.4%) as among nondelinquent controls matched for region, urban size, age, and race (39%). Among problem drinkers, delinquents reported consuming larger amounts of alcohol, drank more often, experienced more negative consequences from drinking, and more frequently saw themselves as having a drinking problem. In addition, the delinquents indicated more illicit drug use. Similar support for an association between higher rates of alcohol and drug use and delinquency (or conduct disorder) is found in the work of Grilo, Becker, Fehon, and Edell (1996), Fergusson, Horwood, and Lynskey (1993), Lund and Landesman-Dwyer (1979), Reichler, Clement, and Dunner, (1983), Van-Kammen, Loeber, and Stouthamer-Loeber (1991), and Windle (1990).

Higher rates of alcohol and drug use have also been found among youths with affective disorders such as depression (Kashani, Keller, Solomon, Reid, & Mazzola, 1985; Lie, 1984; Paton, Kessler, & Kandel, 1977; Reichler *et al.*, 1983). However, more recently researchers have found differences in the relationship between depression and substance abuse that may be related to both social context and gender. For example, Way, Stauber, Nakkula, and London (1994) found no association between depression and substance abuse among a sample of urban high school students, but they did find a relationship between substance abuse and depression in a suburban high school sample and gender differences in the relationship between marijuana and hard drug use and depression. In addition to the literature on youths with cognitive, behavioral, and emotional disturbance, inferences may be made from reviewing studies assessing the link between substance use and educational experiences using retrospective data from alcoholic subjects. As adults, primary alcoholics (i.e., individuals displaying physiological and psychological dependence on alcohol prior to age 40) recall more symptoms of Minimal Brain Dysfunction (MBD) or hyperkinesis (i.e., poorer coordination, delays in walking or speech development, impulsivity, and being easily frustrated) than secondary alcoholics (those whose alcoholism appears primarily reactive) (De Obaldia & Parsons, 1984; Tarter, McBride, Buonpane, & Schneider, 1977). Similarly, Morrison (1979) found that among adult psychiatric patients, alcoholism was more frequent in individuals identified as having childhood hyperactivity (HA) than in clients who did not report childhood HA. Recent work by Thompson, Riggs, Mikulich, and Crowley (1996) and a review by Klein and Mannuzza (1991) similarly support a link between Attention-Deficit Hyperactivity Disorder (ADHD) and substance dependence disorders during adolescence and adulthood. In sum, this work suggests that individually, youths with cognitive, behavior, and/or emotional impairment may be at risk for elevated alcohol and drug use. When schools are organized to concentrate and segregate such youths who may have limited coping and other psychosocial

resources, and are at risk for elevated drug and alcohol use, these schools settings provide contexts that may influence youth substance use.

Neighborhood Context

In addition to the school microsystem, the neighborhood may also be an important context to examine in relation to adolescent substance use. Several reports describe drug use and sales becoming concentrated in specific neighborhood contexts, more often urban, ethnic-minority communities (Blackwell, 1991; Carroll, 1993). Risks associated with substance use may be particularly relevant to the neighborhoods of urban youth. Calhoun, Parker, and Weaver (1995) reported that African Americans from Atlanta and Washington, DC who were younger, had lower incomes, and were still in high school were more concerned about problems with drugs in their neighborhoods. Blount and Dembo (1984), in a sample of inner-city junior high school students, found higher rates of substance use among those adolescents who perceived their environments as being higher in risk. Similarly, in a retrospective study of adults, Nurco, Kinlock, O'Grady, Lerner, and Hanlon (1996) found that narcotic addicts perceived their childhood neighborhoods to be higher in deviance than nonaddicted adults who grew up in the same neighborhoods. Research by Brook, Nomura, and Cohen (1988) found that perceptions of neighborhood (i.e., the perception of neighborhood as being "bad," having low cohesion, and respondents' reports of low neighborhood satisfaction) and perceptions of school (i.e., a high conflict school and poor learning environment) did not act directly on adolescent drug use, but were mediated through family (e.g., parent-child conflict) and peer (e.g., having high achieving friends and being high in peer sociability) factors. Smart, Adlaf, and Walsh (1994) reported that Toronto neighborhoods with highest presence of low income and single-parent families had the highest rates of substance abuse. Exploratory work by Feigelman, Stanton, and Ricardo (1993) found urban early adolescents to describe drug sales in their communities as "omnipresent." These youths also noted that the achievement of wealth, including the means of providing for self and others, was clearly associated with involvement of drug sales. In contrast, drug use was described in more negative terms. Related studies have raised questions as to the potential pathways between and sequence of involvement in drug sales and drug use (e.g., Dembo, Hughes, Jackson, & Williams, 1993; Fagan & Chin, 1990). Despite the emphasis on neighborhood context as a developmental microsystem (e.g., S. E. Mayer & Jencks, 1989), there has been limited work examining neighborhood influences on adolescent substance use.

It is possible that neighborhoods provide access to substances for use, provide human and economic resources that support or diminish the likelihood of use, present community norms for substance use or nonuse, or have physical or social characteristics that may promote or interfere with substance use.

Conceptual Base for the Present Studies

In examinations of family and peer influences on adolescent substance use, researchers have proposed a variety of processes by which social influence might be exerted. These include social learning theory (Kandel, 1978), focusing specifically upon the effects of modeling, imitation, and social reinforcement. In addition, Jessor and Jessor's (1978) work on problem behavior proneness and Hirschi's (1969) Social Control Theory both underline the importance of peers and compromised parent-child relationships. Recent work utilizing a risk factor approach (e.g. Scheier & Newcomb, 1991), which incorporates contributions of factors grounded in multiple theoretical perspectives, again underlines the important contributions of parents and peers to adolescent drug use. There are also a range of relevant theoretical and conceptual arguments for the potential contributions of school and neighborhood. Examinations of school and neighborhood contributions might utilize the categories of neighborhood articulated by Burton, Price-Spratlen, and Spencer (1997). Consequently, research might emphasize schools and neighborhoods as physical sites that influence drug use, considering aspects of the physical environment and social milieu, such as available models of drug use. In addition, youths' perceptions of use norms in their neighborhood or school or perceptions of neighborhood safety would be a potential set of influences on adolescent substance use. Contextual effects may also be linked to youths' social networks in, as well as the culture of, the school and neighborhood. As the present studies represent preliminary examinations of the contribution of school and neighborhood contexts to adolescent substance use, there was a desire to maintain a parallel examination of microsystem influences across all four microsystems, and to build on the existing empirical and conceptual literature. Consequently, we decided to utilize a social learning perspective, emphasizing the influence of modeling and imitation across each microsystem. Social learning effects on adolescent use have been well documented in examinations of parental and peer use, and provide the opportunity consider the influence of school norms for use and neighborhood models of use, as implicated in contagion effects (e.g., Crane, 1991; Mayer & Jencks, 1989).

The present investigations examined the impact of school and neighborhood contexts on adolescent drug use beyond the influence of family and peers. The researchers specifically sought to respond to the following questions:

1. Does normative drug use within the school context influence adolescent drug use over and above the influence of proximal peers and family? In considering the educational contexts of adolescents across regular and special educational settings, especially those settings where youth with special needs are segregated or concentrated, norms for substance use may be higher and there may be fewer peer resources for modeling alternative coping strategies. Consequently, the school context may play an important role in understanding drug use. While earlier research (Elmquist *et al.*, 1992; Leone *et al.*, 1989) has indicated that students in special education settings report a higher level of drug and alcohol involvement, it is unclear whether these differences are specific (a) to the level of the severity of the problems that the student is facing or (b) whether these higher levels of drug use are linked to differences in school norms for use. The present investigation attempts to clarify this issue.

2. Are factors within the neighborhood associated with adolescents reports of drug involvement beyond the influence of parents and peers?

STUDY 1: SCHOOL NORMS

Methods

Participants

Two hundred eighty-three adolescents participated in this study. Students were solicited from six schools in a large county within a major metropolitan area in the eastern part of the United States. The county is ethnically and racially diverse and contains urban, suburban, and rural areas. Respondent participation was based on active consent of both the adolescent and his/her parent or guardian. The six schools included two public junior high schools (one with Grades 7–8; the second, containing Grades 7–9), two public senior high schools (Grades 9–12), and two residential schools (the first containing Grades 8–12; the second, grades 7–12).⁴

⁴Students in residential schools have been identified as having either a learning or behavior disorder and some have both. The residential school is a special education placement which works with students whose dysfunction is of a severity requiring removal from the public school setting and the need to receive special services, more restrictive and structured than those provided in either mainstreamed or self-contained classrooms in the public school. While these schools may be either public or privately administered, their students are referred from public schools. (For additional information regarding educational placements, see Footnotes 3 and 5.)

Table I. Respondent Demographics

School ^a	<i>n</i>	Gender		Race		
		M	F	Black	White	Other
1R	40	40	0	22	12	6
2R	15	8	7	7	5	3
3J	38	28	9	22	11	5
4J	68	39	29	34	22	12
5S	57	32	25	33	20	4
6S	65	34	31	30	28	7
Total	283	181	101	148	98	37

^aR = Residential; J = Junior High; S = Senior High.

Students ranged in age from 13 to 18 years. Response rates ranged from 15.2 to 25.8% for five of the six schools. The overall response rate for these settings was 22.1%. The sixth school, a regular education setting, granted general consent for all students to participate which resulted in a voluntary response rate of 72.7% for students in that setting. For additional information on the demographic characteristics of the sample, see Table I.

Within the four public schools, students were in one of three levels of educational placement. These were (a) regular classes, (b) special education mainstreamed classes⁵ or (c) special education self-contained classes. For the number of students in each placement, see Table II.

Measures

The Student Drug and Alcohol Survey (SDAS). The SDAS was developed by staff at the University of Maryland's Office of Community Based Research. The instrument was based on two primary data sources. The first source involved findings from a "naturalistic inquiry" (Guba & Lincoln, 1985) into residential substance abuse treatment programs for adolescents (Leone, Moss-Greenburg, Trickett, Gould, & O'Neil, 1987). This inquiry was structured around a three-part interview process with adolescents in residential drug treatment, the parents and guardians of these adolescents and their treatment providers. The second data source for the development of the SDAS came from an annotated bibliography on substance abuse

⁵Adolescents in the "mainstreamed" classes have been identified as having either a learning or behavior disorder (or both), and are in Special Education Programming. While these students receive special instruction in targeted core educational courses (e.g., language arts, math, reading etc.), they take the remainder of their courses with students in the regular education curriculum.

Table II. Public School Educational Placement

Public School	Regular	Special Education	
		Mainstreamed	Self-contained
Junior high	53	26	27
Senior high	76	36	10
Total	129	52	37

among handicapped adolescents (Allison & Richardson, 1989). This review of the literature included a review of surveys utilized by researchers studying substance abuse of adolescents over the past 10 years. Research staff reviewed interview data, surveys, and the annotated bibliography. An initial draft of the survey was developed from this staff review. Multiple staff reviews followed to narrow the scope of the measure. An edited draft was presented to an advisory board (i.e., professionals from the local community including psychologists, educators, substance abuse treatment providers, and policy makers) for review.

Subsequent to the advisory board review, drafts of the instrument were reviewed by two separate student groups.

Survey Contents

The SDAS contains questions relating to demographic data (i.e., gender, age, ethnicity, grade, family constellation, and parental employment). In addition, the measure contained questions from the Maryland Adolescent Survey (Maryland Department of Health and Mental Hygiene, Drug Abuse Administration, 1985), assessing the frequency of drug use on 26 separate substances. Participants were asked to indicate their drug use for each item by circling the number corresponding to their drug use, on a scale ranging from 1 (*I have never used it*) to 7 (*I currently use it one or more times a day*). Subjects were then asked to indicate their age at initial use for cigarettes, alcohol, marijuana, cocaine, and PCP.

The SDAS also assessed peer and parental use of drugs and alcohol, and whether there was parental or guardian permission to use drugs and alcohol. Specifically, respondents were asked to indicate on a 5-point scale ranging from none to all, how many of their friends use alcohol, and how many use drugs. In addition, participants were asked to respond yes or no to whether their parents allowed them to drink or use drugs and whether their parents currently drank alcoholic beverages or used drugs.

Setting and Procedure

After receiving permission from the school system to conduct the study, parents and guardians in the five schools where parental consent was required were sent letters giving an overview of the project and requesting permission for their child to participate. All students were told in advance of the research project and that information was being sent to their parents or guardians requesting permission for them to participate in the study. These announcements were made by school staff. Students were also informed as to the date and time that the surveys would be administered.

Surveys were administered to student participants at their schools. Dependent upon the availability of space within the school setting, surveys were administered in classrooms, libraries, auditoriums, or gymnasiums. Within the allotted administration area, care was given to provide spacing between students such that they could not see each other's responses. In addition, participants were provided with a blank piece of paper with which to cover his or her survey responses. Teachers and all school personnel were excluded from the rooms in which the surveys were administered.

Surveys were administered by pairs of research staff. The surveys were administered in groups. Administrators read the entire survey to the students. Students were allowed to ask questions for clarification. Standard responses were provided to students from the administration procedures. At the completion of the survey, students were allowed to ask questions and were given a listing of local resources including a phone hotline relating to alcohol and drug abuse.

Results

Data analyses focused the primary question: Does the school context contribute to adolescent drug use beyond the effects of peer and parental factors?

Level 1 and 2 Drug Use

Prior to examining this question, we decided to examine the extent to which drug use might be collapsed into stages of drug involvement (e.g., Kandel, 1978, 1980), thereby obviating the need for conducting a series of separate analyses to examine the relationship of developmental context to

each individual indicator of drug use. To accomplish this, a principal axis factor analysis with a Varimax rotation was conducted. Two factors with eigenvalues above unity emerged which passed scree test criteria. Items with factor loadings above 0.4 were interpreted. The first factor loaded on all drug use variables except alcohol and cigarette use. The second factor loaded on cigarette, alcohol, and marijuana use. Marijuana use also loaded on the first factor, however, it was decided for conceptual clarity and based on prior work on stages of adolescent drug use (Kandel, 1978, 1980) to compute two scales of drug use, the first for Factor 1 titled, "Level 2 Drug Use" (the computed scale score did not include marijuana use) and a second scale associated with the second factor, titled, "Level 1 Drug Use." Factor loadings are presented in Table III. Cronbach's alphas were conducted on each composite scale, resulting in an alpha of .74 for Level 1 (L1) Drug Use and an alpha of .92 for Level 2 (L2) Drug Use. At the individual level, there was a moderate correlation between the two scales ($r = .36, p < .01$), and the labeling of the scales appeared conceptually reasonable as based on prior literature (e.g., Kandel, 1978). Level 1 Drug Use appears to reflect youths use of substances associated with early or initial drug use. This use of these substances among American youths has become somewhat normative and has been associated with descriptions of experimental or gateway drug use. Level 2 Drug Use, in contrast, appears to reflect more advanced or later drug use and involvement with "hard" drugs.

For the main question, examining the impact of school contexts on substance use, independent variables were chosen within each develop-

Table III. Factor Loadings for Adolescent Drug Use

	Factor 1 Level 2 Drug Use	Factor 2 Level 1 Drug Use
Cigarettes	.36	.61
Alcohol	.31	.58
Marijuana	.56	.51
Hashish	.88	.03
Barbiturates	.88	-.26
Cocaine	.81	-.06
Quaaludes	.78	-.12
PCP	.78	.17
Tranquilizers	.76	-.01
Hallucinogens	.72	.11
Heroin	.71	-.33
Solvents	.55	-.23
Amphetamines	.54	-.06

mental context. Within the family context, parents' use of alcohol and drugs were combined into a single predictor. In the peer context, respondents' reports of peer alcohol and drug use were also combined into a single index of peer use. Within the school context, the level of restriction of the student's school placement, called "Status," was used as a predictor. This score was computed as an ordinal variable such that with each increased level of placement restriction (e.g., the difference between a regular education placement and a mainstreamed special educational placement), a student would receive an additional point. This procedure was based on the educational rationale for restrictiveness of placements and allows the examination of whether it is the presumed restrictiveness of an educational placement or the actual drug use norms in that setting which would be helpful in understanding drug use. To compute an indicator of school drug use norms, means were computed separately for each of the six individual school samples for the combined average use of L1 substances (i.e., alcohol, cigarettes, marijuana), and L2 or illicit drug use (i.e., use of substances other than alcohol, cigarettes, and marijuana) for all respondents from that school. The school norms were computed deleting the effect of the target respondent on the school mean, that is, the normative index of use within each school was computed as the mean of use by all respondents in the school, excluding the reported use of the target respondent. This strategy was utilized to reduce the confounding of the dependent variable (i.e., the individual's reported substance use) and with the predictor variable (i.e., school norms for use), and results in each respondent having a slightly different norm for school use. Correlations among predictor variables are presented in Table IV.

Two series of hierarchical multiple regressions were conducted separately to predict individual self-reports of L1 and L2 drug use. In each regression, a series of demographic factors (age, gender, socioeconomic status as indexed by the sum of mother's and father's occupation, and ethnicity, operationalized as a dichotomous variable—African American or not African American) were entered in the first block. In the second block, parental and peer use were entered. Finally, school norms and level of school placement were entered in the last block. Because of the high correlation between school norms of L1 and L2 drug use ($r = .90$), only L2 drug use was used as a predictor.

In the analysis predicting L1 drug use (full results are presented in Table V), the demographic variables were significant predictors, accounting for 16% of the variance. On this step, age and race, relative to the other variables, were important in the prediction of L1 drug use, with $\beta = .29$, $p < .0001$, and $\beta = .25$, $p < .0001$, respectively. Older and non-African

Table IV. Descriptives and Correlations of Independent Variables Within School Domain

	1	2	3	4	5	6	7	8	9	10
	<i>M(SD/Range)</i>									
1. Sex	—									
2. Age	.07	—								
3. Race	-.01	.07	—							
4. SES	.02	.12	.01	—						
5. Friend's use (FU)	.07	.37 ^b	.34 ^b	.07	—					
6. Parent's use (PU)	-.08	.12	.02	-.06	.08	—				
7. School norms Level 1 drug use	.24 ^b	.51 ^b	-.01	.20 ^b	.32 ^b	-.07	—			
8. School norms Level 2 drug use	.28 ^b	.27 ^b	.03	.19 ^b	.23 ^b	-.09	.90 ^b	—		
9. School placement Level 1 drug use	.30 ^b	.14 ^a	-.03	.19 ^b	.16 ^a	-.15 ^a	.62 ^b	.72 ^b	—	
10. Level 1 drug use	.03	.31 ^b	.25 ^b	.05	.66 ^b	.21 ^b	.37 ^b	.30 ^b	.21 ^a	—
11. Level 2 drug use	.13 ^a	.16 ^a	-.02	.03	.21 ^b	.00	.31 ^b	.30 ^b	.26 ^b	.36 ^b

^a*p* < .05.

^b*p* < .01.

Table V. School Hierarchical Regression: Predicting Level 1 Drug Use

Variable ^a	β Block 1	β Block 2	β Block 3
Sex	.02	-.01	-.07
Age	.29 ^b	.06	.00
Race	.25 ^b	.05	.08
SES	.02	.02	-.02
FU		.60 ^b	.55 ^b
PU		.18 ^b	.21 ^b
Status Level 2			.28 ^b
<i>F</i>	10.74 ^b	33.44 ^b	30.91 ^b
<i>df</i>	(4, 228)	(6, 226)	(8, 224)
Adjusted <i>R</i> ²	.14	.46	.51
<i>R</i> ² -change		.31 ^b	.05 ^b

^aFU = friend's use; PU = parent's use.

^b $p < .001$.

American youth were more likely to have higher rates of L1 substance use. The second block of predictor variables, which included parental and peer models of alcohol and drug use, accounted for an additional 31% of the variance in youths' self-reported L1 drug use. Relative to the other variables in the equation, parental use, $\beta = .18$, $p < .001$, and peer use, $\beta = .60$, $p < .0001$, were significant individual predictors of the adolescents' L1 drug use. Age and race were no longer significant predictors at this step. The addition of school norms for use and the level of educational placement on the third block accounted for an additional 5% of variance in the prediction of adolescent drug use. School norms for L2 drug use, $\beta = .26$, $p < .0001$, along with peer and parental use were significant predictors relative to the other variables in the equation.

In the second hierarchical regression predicting individual self-reports of L2 Drug Use (results are presented in Table VI), demographic variables (gender, age, SES, and ethnicity) accounted for 5% of the variance in use, with gender, $\beta = .14$, $p < .05$ and age, $\beta = .16$, $p < .05$ demonstrating significant contributions relative to the other variables in the equation. Males and older students were more likely to report higher levels of L2 drug use. The addition of peer and parental use on the second block accounted for an additional 3% of variance in L2 drug use. Relative to the other variables in the equation, friend's use of drugs, $\beta = .20$, $p < .01$, was the best predictor of L2 use, and gender remained a significant individual

Table VI. School Hierarchical Regression: Predicting Level 2 Drug Use

Variable ^a	β Block 1	β Block 2	β Block 3
Sex	.14 ^b	.13 ^b	.05
Age	.16 ^b	.10	.05
Race	-.03	-.10	-.07
SES	.00	-.00	-.06
FU		.20 ^c	.15 ^b
PU		-.04	-.01
Status			.11
Level 2			.22 ^b
<i>F</i>	2.91 ^b	3.33 ^b	5.12 ^d
<i>df</i>	(4, 228)	(6, 226)	(8, 224)
Adjusted <i>R</i> ²	.03	.06	.12
<i>R</i> ² -change		.03 ^b	.07 ^d

^aFU = friend's use; PU = parent's use.

^b*p* < .05.

^c*p* < .01.

^d*p* < .001.

predictor. With the addition of the third block, school variables accounted for an additional 7% of the variance in L2 drug use, with school norms demonstrating a significant relationship to L2 drug use relative to other predictors, $\beta = .22$, $p < .05$, and peer use remaining the only other significant individual predictor.

STUDY 2: NEIGHBORHOOD FACTORS

Methods

Sample

Students were recruited from the two local high schools from a midsize urban area in the northeastern United States. The high schools reported an enrollment of approximately 1,100 students in the 9th and 10th grades. Students were solicited from freshman or sophomore English or social studies classes (courses required of all students at these grade levels). Approximately 400 students were approached for participation. One hundred fourteen adolescents from the 9th and 10th grades agreed to be respon-

dents. These participants ranged in age from 14 to 17. Mean age was 15. The sample of 86 girls and 26 boys (2 respondents did not indicate their gender) was predominately African American (71.9%), but also contained Caucasian (14.9%), Hispanic (7.9%), and Asian American (0.9%) respondents. Based on reports of parental education and occupation, the sample largely comprised individuals from skilled, working-class families (Hollingshead $M = 31.7$, $SD = 11.3$).

Measures

The data collection for Study 2 was not specifically targeted to examine adolescent drug use, however several indices contained items assessed respondents' drug involvement.

The Urban Adolescent Life Experiences Scale (UALES) was designed to tap the life experiences of urban adolescents. Development of the measure is described in Allison *et al.* (in press). The measure has a total of 127 items which were grouped within four categories: School (17 items); Family/Community (37 items); Peer (22 items); and Personal (51 items). In responding to the scale, students were asked to indicate whether the events had occurred over the past 6 months, the frequency of the event (i.e., how often it had occurred), and the type of impact it had on them using a 5-point scale ranging from *very bad* to *very good*. These rating procedures are simplified versions of the frequency, and a combined index of impact desirability ratings used by other life events researchers (e.g., Compas, Davis, Forsythe, & Wagner, 1987). In a sample of middle-school students, the measure demonstrated test–retest reliability of .84 over a 2-week period for the occurrence and nonoccurrence of events.

Although not designed to specifically tap students' experiences of use, the instrument contains several items that allow respondents to report on their own alcohol and drug use. In addition, two items each related to the frequency of the youth's parents' use, and their friends' drug use. These item pairs were summed to create parental and peer use indices, respectively. In addition, the measure contained items where students were able to indicate whether they have been approached to sell drugs.

In addition to the UALES, parents completed the Child Behavior Checklist (CBCL) and student respondents completed the Youth Self-Report (YSR) (Achenbach & Edelbrock, 1983). Individual items from the CBCL and YSR ("I use alcohol or drugs for nonmedical purposes.") were also used to tap reported substance use. In addition three items from Wills (1986) coping inventory for early adolescents that specifically tap substance use were also used to index youth's substance involvement. Self-report items

from the UALES, YSR, and Wills's measure as well as the item from the CBCL were converted to z scores and summed to create a substance use index.

Neighborhood Indices

Adolescents were asked to indicate the name of their neighborhood as well as their street address. This information was linked to census tract designations within the urban area. Because of concerns linked to variability of demographic and other neighborhood characteristics within census tracts (Allison *et al.*, in press; Burton *et al.*, 1997), census data were aggregated at the block-group level. These area designations had been determined in extensive ethnographic work in this community by Burton. Several indicators were examined. Indices associated with a range of conceptual factors such as youths' access to economic resources within the community (indexed as childhood poverty), neighborhood stability (operationalized as percentage of homes not owned and vacant housing), access to social/educational capital (measured as rates of High School Dropout), and community economic viability (male unemployment) were measured. Because the examination of neighborhood factors to assist in understanding child and adolescent development in general, and adolescent substance use in particular, is in its reasonably early stages, and conceptual work has only recently articulated the range of strategies for examining neighborhood effects (Burton *et al.*, 1997), at present there is no clear empirical support for the selection of one conceptually reasonable factor over another; therefore each of the five census variables was aggregated for clusters of residential block-groups. These five indices were then converted to z scores and summed to create a composite index for each neighborhood. Table VII contains the original aggregated Census indices for the 18 cluster sectors from the urban area studied. Census data were taken from Summary Tape File 3A (U. S. Department of Commerce, 1993).

In addition, two indices from the Neighborhood Assessment of Community Characteristics (NACC; Spencer, McDermott, Burton, & Cole, 1997) were used to tap presence of drugs within each neighborhood. The NACC is a windshield survey that examines a range of physical and social characteristics of specified neighborhoods. Trained observers indicate the presence of a range of housing characteristics and quality, and the presence of commercial and service resources. These assessments were available from assessments made for the Intergenerational Relationships in Adolescent Pregnancy Project (IRAP; Burton, 1987). For the current analyses, two items examining the social milieu of the neighborhood specifically

Table VII. Percentage Rates for Neighborhood Area Census Indicators

Cluster Sector	Male Jobless	Welfare Receipt	Vacant Housing	H.S. Dropout	Homes Owned
1.1	34.00	25.88	13.20	10.80	34.00
1.2	18.00	06.40	33.00	20.20	20.00
1.3	30.00	17.70	10.10	50.70	20.00
1.4	25.14	15.71	12.60	28.80	17.70
1.5	27.00	22.00	14.00	40.90	50.00
1.6	22.50	09.25	55.00	12.50	45.00
2.1	61.00	59.00	06.00	40.30	20.00
2.2	49.30	15.00	24.00	06.30	62.00
2.3	37.00	05.00	35.00	25.10	46.00
2.4	16.33	13.67	50.00	21.10	34.00
3.1	39.80	25.60	12.40	48.00	38.00
3.2	28.00	17.20	10.00	31.70	35.00
3.3	25.83	08.00	10.00	40.20	35.10
3.4	41.25	26.00	20.00	39.40	43.00
3.5	28.00	25.00	33.00	44.90	53.00
4.1	27.50	00.00	00.00	10.08	07.00
4.2	57.00	60.00	05.00	46.70	76.00
4.3	14.00	14.01	01.00	12.50	64.00

linked to the presence of drug use in the area (seeing a “Person who is visibly high” or “Person selling drugs”) were summed to create a neighborhood drug presence index.

Setting and Procedures

Students were provided with a description of the project, and asked to participate in the study. All students who indicated interest were provided with parental consent forms and forms to obtain parental ratings of their adolescent’s adjustment using the CBCL (Achenbach & Edelbrock, 1983).

Measure administration sessions were held during the school day, and students completed measures including the life events scale, and a general information sheet which requested information on ethnicity, address of residence, and parental education and occupation. Measures were completed in small groups. Measures were administered by teams of graduate and undergraduate students. Students were also provided with a self-referral form that allowed them to set up a time to discuss issues raised in the measures with school guidance staff. Students were paid \$5 for their participation.

Results

Means, standard deviations, and variable ranges, as well as bivariate relationships between predictors and with the dependent variable are presented in Table VIII. Similar to the school analyses, hierarchical regressions were conducted with demographic variables (SES measured as mother's level of educational attainment indexed on a 7-point scale, gender, age, and ethnicity indexed as a dichotomous, Black, non-Black variable) entered in the first block, family and peer use variables entered on the second block and the two neighborhood variables (i.e., the composite Census and summed NACC drug items) entered on the third block.

Results for this analysis are presented in Table IX. Demographic variables entered on the first step contributed 5% of variance in predicting the use index, but were not significant as a group. Mother's education did demonstrate a significant individual relationship with use, $\beta = -.18$, $p < .05$. On the second step, parental and peer use contributed an additional 19% of variance to the prediction of use. Parental use was the only significant individual predictor of use, $\beta = .39$, $p < .001$. On the third step, the composite Census and the NACC index contributed a nonsignificant, additional 1% of variance to the model. While not focal in the present analyses, it is interesting to note that respondents' reports of pressure to sell drug were not correlated with either neighborhood index, but were associated with both peer and parental use.

DISCUSSION

Although results from the first study suggest that peer, family, and school domains are important in understanding adolescent drug use, the peer domain appears, as suggested in previous work (e.g., Dishion, 1978; Kandel *et al.*, 1988) to contribute substantially to the understanding of adolescents' Level 1 drug use. It is notable, however, that the school domain, which has received relatively little empirical attention with respect to adolescent drug use, was an important predictor of adolescent drug use. This suggests that school settings, as social contexts that affect adolescent development, may present important social norms for adolescent substance use or may vary with respect to the access to and availability of alcohol and drugs. Although it could be argued that drug use in the school context is simply an alternative index of peer drug use, the associations between school norms and reports of friend's use of drugs and alcohol were low to moderate ($r = .23$ to $.32$). These findings demonstrate that the school context is an important developmental setting and should be examined

Table VIII. Descriptives and Correlations of Independent Variables Within Neighborhood Domain

Variable	<i>M(SD/range)</i>	1	2	3	4	5	6	7	8	9
1. Gender	1.23 (0.42/1-2)	—								
2. Age	15.29 (0.92/14-17)	.06	—							
3. Race	1.28 (0.45/1-2)	-.13	-.17	—						
4. Mother's education	4.24 (1.13/2-7)	.06	-.07	-.10	—					
5. Friend's use	5.93 (6.12/0-20)	-.06	-.31 ^b	.01	-.17	—				
6. Parental use	0.82 (1.43/0-6)	-.05	.03	.01	-.24 ^a	.47 ^b	—			
7. Census	0.00 (1.91/-2.29-5.39)	-.04	.10	.17	.14	-.09	-.04	—		
8. NACC	3.18 (0.88/2-4)	.20	-.29 ^b	.01	.20	.23 ^a	.20	.30 ^b	—	
9. Use	0.00 (3.66/-1.98-15.77)	.08	.10	.03	-.19	.24 ^b	.45 ^b	.04	.19	—
10. Sell	1.38 (1.98/0-8)	.15	-.15	.05	-.03	.44 ^b	.21 ^a	.06	.08	.12

^a*p* < .05.

^b*p* < .01.

Table IX. Neighborhood Hierarchical Regression: Predicting Youth Drug Use

Variable ^a	β Block 1	β Block 2	β Block 3
Gender	.09	.11	.13
Age	.10	.12	.16
Race	.01	.02	.03
Mother's education	-.18 ^a	-.08	-.06
Friend's use		.09	.09
Parental use		.39 ^c	.37 ^c
Census			-.00
NACC			.13
<i>F</i>	1.46(ns)	5.33 ^c	4.25 ^c
<i>df</i>	(4, 109)	(6, 107)	(8, 105)
Adjusted <i>R</i> ²	.02	.19	.19
<i>R</i> ² -change	.05	.18 ^d	.02(ns)

^a*p* < .05.^b*p* < .01.^c*p* < .001.^d*p* < .0001.

more closely relative to its impact on adolescents' use of alcohol and other drugs.

Note that the level of school placement demonstrates a very strong association with the normative level of advanced drug use in the school setting; however, our results indicate that normative rates of drug use within the school are better predictors of youth use than educational status. Work by Botvin and his colleagues (Bauman, Botvin, Botvin, & Baker, 1992; Botvin *et al.*, 1992) reported that normative expectations (i.e., adolescents' beliefs about the extent of cigarette use among their peers) are important in understanding adolescent smoking behavior beyond the impact of the perception of peer use. In addition, prevention work by Hansen and Graham (1991) has indicated that correcting the erroneous perceptions of adolescents regarding the alcohol and drug use of their peers is effective in reducing alcohol, cigarette, and marijuana use. While the present investigation did not examine normative expectations, when present results are considered in combination with the work of Botvin and Hansen, perceptions of peer use, expectations for peer use, and actual rates of peer use have each been identified as important influences on adolescent drug use. Future research should further examine the relative and specific contribution of youth perceptions, expectations, and actual behavioral norms in both proximal (e.g., peer) and distal (e.g., school norms) social contexts.

In the second study, neighborhood factors were not relevant to youths' self-reports of drug and alcohol use, although family use contributed to the prediction of youth use. While there was a significant bivariate relationship between peer use with youth use, parental use appeared to be more central to youth use in this sample. This may be related to the high representation of adolescent females in this sample and work emphasizing family and home as important influences in the social contexts of African American females (e.g., Scott & Black, 1989). It is also interesting to note that the NACC index, which assessed the presence of drug activity in the neighborhood, was significantly and positively associated with peer use.

While the importance of school norms in understanding adolescent drug use seems supported, it would be premature based on the current analyses to accept that neighborhoods have no effect on adolescent drug use. The present examinations must be considered preliminary and the findings interpreted with caution and in the context of the available empirical and conceptual literature. Several factors warrant attention and further consideration. For example, it is important to note that there was a low response rate and a notable gender imbalance in the second study. This relatively low representation of males, who, in urban African American neighborhoods, have been described as having more street-oriented social networks (Scott & Black, 1989) and higher levels of drug use, may result in an underestimation of neighborhood contributions to youth use. Similarly, the lack of findings may be linked with other research on neighborhood effects where relationships have not been established for females, but have been present for males (e.g., Ensminger, Lamkin, & Jacobson, 1996; Entwisle, Alexander, & Olson, 1994). It is also possible that the students who were not available for participation in this second sample (i.e., youths who were absent due to their own choice or due to suspension or expulsion, and youths who were not interested in participating, who possibly were not organized enough or did not have the adequate parental support and connection to return consent forms) may be adolescents who demonstrate higher levels of drug involvement and may have greater exposure to both neighborhood and peer influences. In addition, research has often described lower levels of substance use among African American adolescents in comparison to European Americans (e.g., Maddahain, Newcomb, & Bentler, 1985; Welte & Barnes, 1987). It is also possible that neighborhood factors are more relevant to drug use among African Americans slightly later in the life course, when substance abuse problems may be more likely to be diagnosed.

These studies should also be considered preliminary relative to other limitations and related conceptual issues. Data for the second study were

collected in a single urban site. It is possible that the variability of neighborhood indicators and types of neighborhoods sampled within this single setting are not adequate for the examination of neighborhood effects on drug use. Although many of the areas sampled have some history of drug trafficking, the intensity of sales may not be as high as in larger urban areas. The operationalization of the contextual constructs linked with family, peers, and schools were selected by the authors and are clearly a small subset of potential indices available to describe each setting. While these choices were based on the conceptual and theoretical focus of the current work and emphasize the influence of social learning and contextual norms, there are a wealth of other constructs and dimensions that are relevant to understanding the influence of each of these contextual domains on adolescent substance use. Perceptions of family, neighborhood, and school environment, peer, and family support, and a wealth of other structural and process variables may be (and have been) linked with adolescent substance use. For example, the quality of the school environment, access to drugs in the school or in the local community, processes that encourage student's attachment to school and adults within that setting as well as stress experiences in the school setting may also be important in understanding other pathways through which schools might influence adolescent drug use. There were also limitations in some of the measures utilized, most notably the drug use index in the second study which was computed from other measures not specifically designed to measure drug use. In addition, both studies had relatively low response rates and data are not available to examine potential differences between individuals who participated and those who did not. Although this presents problems regarding potential sample bias in the first study, this would be even more problematic were only regular educational settings sampled. Although each sample has clear limitations, each also provides access to data examining unique and important contextual factors. Few studies have examined contributions of school use norms, level of educational placement, census data, or objective measures of neighborhood drug presence. Finally, because of limitations in the sampling for both studies, it was not possible to use hierarchical linear modeling (e.g., Raudenbush & Bryk, 1988) which would have allowed for a more appropriate estimation of parameters for nested data. Specifically, it is not possible in the current analyses to consider the contribution of school norms and neighborhood factors to the potential variability in the relationship between demographic or social predictors of youth use across each school or neighborhood setting.

Despite these limitations, findings from the present examinations and available literature underline the importance of contextual effects

on behavior, and point to schools as important developmental settings for understanding adolescent substance use. There is the clear need to further examine adolescent drug use within both neighborhood and school contexts. Implications at the neighborhood level are less clear; however, the association between neighborhood presence of drug models, and peer use, especially considering the association between the neighborhood index and youth use, warrants further examination. If peers serve as conduits for neighborhood effects as suggested by Crane (1991), then a prevention focus with peers at the neighborhood level may be efficacious.

Although the present results have implications for prevention and intervention, these must be moderated by the preliminary nature of the present studies. The results do suggest that the organization of schools that cluster and concentrate students with limited coping strategies may support student's continued use of substances and limit opportunities for learning and implementing alternative and more adaptive coping options. Prevention and intervention programs may also need to be emphasized within special educational placements, where in some school districts such programs are absent. In addition, the present results do support the continuation of peer-orientated interventions.

Considering the current direction of preventive interventions, the results further suggest that there may be value in thinking about prevention across different levels of analysis, in different settings, and around goals that may have both direct impact (e.g., individual interventions geared toward altering adolescent risk behaviors) and indirect impact (e.g., reducing the availability of drugs and drug use models in the neighborhood) on drug use. At present, the implications of the ecological perspective have not been fully reflected in the predominately individually based interventions in the prevention arena. Broadening our lens may be important, including examinations of contextual effects beyond the microsystem. This could involve work at the meso-, exo-, and macrosystemic level, such as international comparisons of government drug policy. Overall, the current work suggests that there is utility in examining different levels of analysis, and that there is a need for empirical work to more thoroughly examine school and neighborhood effects. Such research should consider a range of conceptual and measurement issues, across school and neighborhood settings (see Burton *et al.*, 1997). Answers to these research questions may assist us in understanding how different neighborhood factors differentially affect adolescents and their families who differ in risk factor, family structure, and school connectedness. Resulting work may lead to increased precision about which neighborhood and school processes mediate specific aspects of adolescent substance use.

REFERENCES

- Achenbach, T. M., & Edelbrock, C. S. (1983). *Manual for the Child Behavior Checklist*. Burlington, VT: Author.
- Allison, K. W., Burton, L., Marshall, S., Perez-Feblez, A., Yarrington, J., Kirsh, L. B., & Merriwether-DeVries, C. (in press). Life experiences among urban adolescents: Examining the role of context. *Child Development*.
- Allison, K. W., & Richardson, K. A. (1989). *Annotated bibliography of substance abuse among handicapped, disabled, and high risk individuals and treatment resources for the handicapped or disabled substance abuser*. College Park: University of Maryland Department of Special Education.
- Barnea, Z., Teichman, M., & Rahav, G. (1992). Personality, cognitive, and interpersonal factors in adolescent substance abuse: A longitudinal test of an integrative model. *Journal of Youth and Adolescence, 21*, 187-201.
- Barnes, G. M., Farrell, M. P., & Banerjee, S. (1994). Family influences on alcohol abuse and other problem behaviors among Black and White adolescents in a general population sample. *Journal of Research on Adolescence, 4*(2), 183-201.
- Barnes, G. M., & Welte, J. H. (1986). Patterns and predictors of alcohol use among 7-12th grade students in New York State. *Journal of Studies on Alcohol, 47*, 53-62.
- Bauman, K. E., Botvin, G. J., Botvin, E. M., & Baker, E. (1992). Normative expectations and the behavior of significant others: An integration of traditions in research on adolescent cigarette smoking. *Psychological Reports, 71*, 568-570.
- Blackwell, J. E. (1991). *The Black community: Diversity and unity*. New York: Harper Collins.
- Blane, H. T. (1982-1983). Problem drinking in delinquent and nondelinquent adolescent males. *American Journal of Drug and Alcohol Abuse, 9*, 221-232.
- Blount, W., & Dembo, R. (1984). Personal drug and attitudes toward prevention among youth living in a high risk environment. *Journal of Drug Education, 14*, 207-225.
- Botvin, G. J., Botvin, E. M., Baker, E., Dusenbury, L., & Goldberg, C. J. (1992). The false consensus effect: Predicting adolescents' tobacco use from normative expectations. *Psychological Reports, 70*, 171-178.
- Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology, 22*, 723-742.
- Bronfenbrenner, U., Moen, P., & Garbarino, J. (1984). Child, Family, and Community. In R. Parke (Ed.), *Review of Child Development Research* (Vol 7, pp. 283-328). Chicago: University of Chicago Press.
- Brook, J. S., Nomura, C., & Cohen, P. (1988). A network of influences on adolescent drug involvement: Neighborhood, school, peer, and family. *Genetic, Social and General Psychology Monographs 115*, 125-145.
- Brooks, J. S., Lukoff, I. F., & Whiteman, M. (1977). Correlates of marijuana use as related to age, sex and ethnicity. *Yale Journal of Biology and Medicine, 50*, 383-390.
- Burton, L. M. (1987). *Intergenerational relationships and adolescent childbearing: Socioeconomic context and family transitions* (Contract No. 5929MH46057-02). Washington, DC: National Institute of Mental Health.
- Burton, L. M., Price-Spratlen, T., & Spencer, M. B. (1997). On ways of thinking about measuring neighborhoods: Implications for studying context and developmental outcomes for children. In J. Brooks-Gunn, G. J. Duncan, & J. L. Aber (Eds.), *Neighborhood poverty: Context and consequences for children*. New York: Russell Sage Foundation Press.
- Calhoun, T., Parker, K. D., & Weaver, G. (1995). Attitudes of African American toward drugs in the community: A multivariate analysis. *Western Journal of Black Studies, 19*, 143-148.
- Carroll, C. R. (1993). *Drugs in modern society* (3rd ed.). Dubuque, IA: Brown and Benchmark.
- Chassin, L. (1984). Adolescent substance use and abuse. *Advances in Child Behavioral Analysis & Therapy, 139*, 9-152.

- Clements, J. E., & Simpson, R. (1978). Environmental and behavioral aspects of glue sniffing in a population of emotionally disturbed adolescents. *International Journal of the Addictions, 13*, 129–134.
- Compas, B., Davis, G. E., Forsythe, C. J., & Wagner, B. M. (1987). Assessment of major and daily life stressful events during adolescence: The Adolescent Perceived Events Scale. *Journal of Consulting and Clinical Psychology, 55*, 534–541.
- Coombs, R. H. (Ed.). (1988). *The family context of adolescent Drug use*. New York: Haworth.
- Coombs, R. H., & Landsverk, J. (1988). Parenting styles and substance use during childhood and adolescence. *Journal of Marriage and Family, 50*, 473–482.
- Coombs, R. H., Paulson, M. J., & Richardson, M. A. (1991). Peer vs. parental influence in substance use among Hispanic and Anglo children and adolescents. *Journal of Youth and Adolescence, 20*, 73–88.
- Crane, J. (1991). The epidemic theory of ghettos and neighborhood effects on dropping out and teenage child bearing. *American Journal of Sociology, 96*, 1126–1260.
- Dembo, R., Hughes, P., Jackson, L., & Mieczkowski, T. (1993). Crack cocaine dealing by adolescents in two public housing projects: A pilot study. *Human Organization, 52*, 89–96.
- Denton, R. E., & Kampfe, C. (1994). The relationship between family variables and adolescent substance abuse: A literature review. *Adolescence, 29*, 475–495.
- De Obaldia, R., & Parsons, O. A. (1984). Relationship of neuropsychological performance to primary alcoholism and self-reported symptoms of childhood minimal brain dysfunction. *Journal of Studies on Alcohol, 45*, 386–392.
- Dishion, T., Capaldi, D., Sprackelen, K., & Li, F. (1995). Peer ecology of male adolescent drug use. *Development and Psychopathology, 7*, 803–824.
- Dishion, T. J., Patterson, G. R., & Reid, J. R. (1988). Parent and peer factors associated with drug sampling in early adolescence: implications and treatment. *Adolescent Drug Abuse: Analysis, Treatment, Research* (NIDA Research Monograph). Washington DC: U.S. Government Printing Office.
- Elliot, D. S., Huizinga, D., & Ageton, S. S. (1982). *Explaining delinquency and drug use* (Report No. 21). Boulder, CO: Behavioral Research Institute.
- Elmquist, D. L., Morgan, D. P., & Bolds, P. K. (1992). Alcohol and other drug use among adolescents with disabilities. *International Journal of the Addictions, 27*, 1475–1483.
- Ensminger, M. E., Lamkin, R. P., & Jacobson, N. (1996). School leaving: A longitudinal perspective including neighborhood effects. *Child Development, 67*, 2400–2416.
- Entwistle, D. R., Alexander, K. L., & Olson, L. S. (1992). The gender gap in math: Its possible origins in neighborhood effects. *American Sociological Review, 57*, 822–838.
- Fagan, J., & Chin, K. (1990). Violence as a regulation and social control in the distribution of crack. In M DeLaRosa, E. Y. Lambert, & B. Gropper (Eds.), *Drugs and violence: Causes, correlates, and consequences* (NIDA Research Monograph No. 103, pp. 8–43). Rockville, MD: NIDA.
- Fawzy, I., Coombs, R. H., & Gerber, B. (1983). Generational continuity in the use of substances: The impact of parental substance use on adolescent substance use. *Addictive Behaviors, 8*, 109–114.
- Feigelman, S., Stanton, B. F., & Ricardo, I. (1993) Perceptions of drug selling and drug use among urban youths. *Journal of Early Adolescence, 13*, 267–284.
- Foxcroft, D., & Lowe, G. (1995). Adolescent drinking, smoking and other substance use involvement: links with perceived family life. *Journal of Adolescence, 18*, 159–177.
- Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1993). Prevalence and comorbidity of DSM-III-R diagnoses in a birth cohort of 15 years olds. *Journal of the American Academy of Child and Adolescent Psychiatry, 32*, 1127–1134.
- Gorusch, R. L., & Butler, M. C. (1976). Initial drug abuse: A review of predisposing social-psychological factors. *Psychological Bulletin, 83*, 120–137.
- Grilo, C. M., Becker, D. F., Fehon, D. C., & Edell, W. S. (1996). Conduct disorder, substance use disorders, and coexisting conduct and substance use disorders in adolescent inpatients. *American Journal of Psychiatry, 153*, 914–920.
- Guba, E. G., & Lincoln, Y. S. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

- Hansen, W. B., & Graham, J. W. (1991). Preventing alcohol, marijuana, and cigarette use among adolescents: Peer pressure resistance training versus establishing conservative norms. *Preventive Medicine, 20*, 414–430.
- Hirschi, T. (1969). *Causes of delinquency*. Berkeley: University of California Press.
- Huang, A. M. (1981). The drinking behavior of the educable mentally retarded and nonretarded students. *Journal of Alcohol and Drug Education, 26*, 41–50.
- Huba, G. J., Wingard, J. A., & Bentler, P. M. (1979). Beginning adolescent drug use and peer and adult interaction patterns. *Journal of Consulting and Clinical Psychology, 47*, 265–276.
- Jessor, R., & Jessor, S. L. (1978). Theory testing in longitudinal research on marijuana use. In D. Kandel (Ed.), *Longitudinal research on drug use: Empirical findings and methodological issues*. Washington, DC: Hemisphere.
- Kandel, D. (1978). Convergence in prospective longitudinal surveys of drug use in normal populations. In D. B. Kandel (Ed.), *Longitudinal research on drug use: Empirical findings and methodological issues*. New York: Halstead.
- Kandel, D. B. (1980). Drug and drinking behavior among youth. *Annual Review of Sociology, 6*, 235–285.
- Kandel, D. B., & Andrews, K. (1987). Processes of adolescent socialization by parents and peers. *International Journal of the Addictions, 22*, 319–342.
- Kandel, D., Kessler, R., & Margulies, R. (1978). Adolescent initiation into stages of drug use: A developmental analysis. In D. Kandel (Ed.), *Longitudinal research on drug use: Empirical findings and methodological issues* (pp. 73–100). Washington, DC: Hemisphere-Wiley.
- Kashani, J. H., Keller, M. B., Solomon, Reid, J. C., & Mazzola, D. (1985). Double depression in adolescent substance users. *Journal of Affective Disorders, 8*, 153–157.
- Klein, R. G., & Mannuzza, S. (1991). Long-term outcome of hyperactive children: A review. Special Section: Longitudinal research. *Journal of the American Academy of Child and Adolescent Psychiatry, 30*, 383–387.
- Leone, P. E. (1991). *Adolescent and other drugs: Use abuse and disabilities*. Reston VA: Council for Exceptional Children.
- Leone, P. E., Greenburg, J. M., Trickett, E. J., & Spero, E. (1989). A study of the use of cigarettes, alcohol, and marijuana by students identified as seriously emotionally disturbed. *Counterpoint, 9*, 6–7.
- Leone, P., Moss-Greenburg, J., Trickett, E. J., Gould, J., & O'Neil, J. (1987). Substance abuse among handicapped adolescents. Unpublished manuscript.
- Lie, G. Y. (1984). A longitudinal and multivariate study of adolescent alcohol involvement. *Dissertation Abstracts International, 46*, 264A.
- Lund, C. A., & Landesman-Dwyer, S. (1979). Pre-delinquent and disturbed adolescents: the role of parental alcoholism. In M. Galanter (Ed.), *Currents in alcoholism* (Vol. 5, pp. 339–348). NY: Grune and Stratton.
- Maddahain, E., Newcomb, M. D., & Bentler, P. M. (1985). Single and multiple patterns of adolescent substance use: Longitudinal comparisons of four ethnic groups. *Journal of Drug Education, 15*, 311–326.
- Martin, M., & Pritchard, M. (1991). Factors associated with alcohol use in later adolescence. *Journal of Studies on Alcohol, 52*, 5–9.
- Maryland Department of Health and Mental Hygiene, Drug Abuse Administration. (1985). *State of Maryland Adolescent Drug Survey*.
- Mayer, J. E. (1980). Adolescents alcohol misuse: A family systems perspective. *Journal of Alcohol and Drug Education, 26*, 1–11.
- Mayer, S. E., & Jencks, C. (1989). Growing up in poor neighborhood: How much does it matter? *Science, 243*, 1441–1445.
- Morrison, J. R. (1979). Diagnosis of adult psychiatric patients with childhood hyperactivity. *American Journal of Psychiatry, 136*, 955–958.
- Mounts, N., & Steinberg, L. (1995). An ecological analysis of peer influence on adolescent grade point average and drug use. *Developmental Psychology, 31*, 915–922.

- Needle, R., McCubbin, H., Wilson, M., Reineck, R., Lazar, A., & Mederer, H. (1986). Interpersonal influences in adolescent drug use—the role of older siblings, parents, and peers. *International Journal of the Addictions, 21*, 739–766.
- Nurco, D. N., Kinlock, T., O'Grady, K., Lerner, M., & Hanlon, T. E. (1996). Perceptions of social pathology in the neighborhood and the etiology of narcotic addiction: A retrospective study. *Journal of Nervous and Mental Disease, 184*, 35–42.
- O'Connell, D. L., Alexander, H. M., Dobson, A. J., Lloyd, D. M., Hades, G. R., Springthorpe, H. S., & Leeder, S. R. (1981). Cigarette smoking and drug use in school children: 11 factors associated with smoking. *International Journal of Epidemiology, 10*, 223–244.
- Paton, S., Kessler, R., & Kandel, D. (1977). Depressive mood and adolescent illicit drug use: A longitudinal analysis. *Journal of Genetic Psychology, 131*, 267–289.
- Pressons, C. C., Chassin, L., Sherman, S. J., Olshavsky, R., Bensenberg, M., & Corty, E. (1984). Predictors of adolescents' intentions to smoke: Age, sex, race and regional differences. *International Journal of the Addictions, 19*, 503–519.
- Protinsky, H., & Shilts, L. (1990). Adolescent substance use and family cohesion. *Family Therapy, 17*, 173–175.
- Raskin, R., Novacek, J., & Hogan, R. (1992). Drug culture expertise and substance abuse. *Journal of Youth and Adolescence, 21*, 625–637.
- Raudenbush, S., & Bryk, A. (1988). Methodological advances in studying effects of schools and classrooms on student learning. *Review of Research in Education*, Vol 15, pp. 423–475. Washington, DC: American Educational Research Association.
- Reichler, B. D., Clement, J. L., & Dunner, D. L. (1983). Chart review of alcohol problems in adolescent psychiatric patients in an emergency room. *Journal of Clinical Psychiatry, 44*, 338–339.
- Scheier, L. M., & Newcomb, M. D. (1991). Differentiation of early adolescent predictors of drug use initiation and escalation: A developmental risk model. *Journal of Substance Abuse, 3*, 277–299.
- Scott, J. W., & Black, A. (1989). Deep structures of African American family life: Female and male kin networks. *Western Journal of Black Studies, 13*, 17–24.
- Segal, B., & Stewart, J. (1996). Substance use and abuse in adolescence: An overview. *Child Psychiatry and Human Development, 26*(4), 193–210.
- Shilts, L. (1991). The relationship of early adolescent substance use to extracurricular activities, peer influence, and personal attitudes. *Adolescence, 26*, 613–617.
- 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 and Adolescent Substance Abuse, 3*, 37–46.
- Spencer, M.B., McDermott, P. A., Burton, L. M., & Cole, S. P. (1997). An alternative approach to assessing neighborhood effects. In J. Brooks-Gunn, G. J. Duncan, & J. L. Aber (Eds.), *Neighborhood poverty: Context and consequences for children*. New York: Russell Sage Foundation Press.
- Stephenson, A. L., Henry, C., & Robinson, L. (1996). Family characteristics and adolescent substance use. *Adolescence, 31*, 59–77.
- Tarter, R. E., McBride, H., Buonpane, N., & Schneider, D. U. (1977). Differentiation of alcoholics. *Archives of General Psychiatry, 34*, 761–768.
- Thompson, L. L., Riggs, P. D., Mikulich, S. K., & Crowley, T. J. (1996). Contribution of ADHD symptoms to substance problems and delinquency in conduct-disordered adolescents. *Journal of Abnormal Child Psychology, 24*, 325–347.
- U.S. Department of Commerce, Bureau of the Census. (1993). *Census of population and housing. 1990* (Summary Tape 3A computer file). Washington, DC: Author.
- Van Kammen, W. B., Loeber, R., & Stouthamer-Loeber, M. (1991). Substance use and its relationship to conduct problems and delinquency in young boys. *Journal of Youth and Adolescence, 20*, 399–413.
- Way, N., Stauber, H. Y., Nakkula, M. J., & London, P. (1994). Depression and substance use in two divergent high school cultures: A quantitative and qualitative analysis. *Journal of Youth and Adolescence, 23*, 331–337.

- Welte, J., & Barnes, G. M. (1987). Alcohol use among adolescent minority groups. *Journal of Studies on Alcohol, 48*, 329-336.
- Wills, T. (1986). Stress and coping in early adolescence: Relationships to substance use in urban school samples. *Health Psychology, 5*, 503-529.
- Wills, T. A., & Vaughn, R. (1989). Social support and substance use in early adolescence. *Journal of Behavioral Medicine, 12*, 321-339.
- Windle, M. (1990). A longitudinal study of antisocial behaviors in early adolescence as predictors of late adolescent substance use: Gender and ethnic group differences. *Journal of Abnormal Psychology, 99*, 86-91.
- Zetlin, A.G. (1985). Mentally retarded teenagers: adolescent behavior disturbance and its relation to family environment. *Child Psychiatry and Human Development, 15*, 243-254.