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## Predictors of substance use among homeless youth in San Diego<sup>☆</sup>

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### Abstract

This study examined the frequency of substance use among 14- to 24-year-old homeless youth ( $N=113$ ) recruited from two community drop-in centers and explored the relationship between substance use and hypothesized psychosocial predictors. Audio-computer-assisted self-interviewing (A-CASI) was used for assessment. Including alcohol and tobacco, the mean number of different drugs used was 3.55 for lifetime and 2.34 for the last 3 months. A three-block hierarchical multiple regression was conducted to determine potential predictors of overall drug use (the sum of all different drugs used) during the last 3 months. Block 1 included demographic variables, Block 2 included a parental monitoring variable, and Block 3 included peer and environmental variables derived from learning theories. Parental monitoring (–) and peer variables (+) predicted overall 3-month drug use. The final model explained 36% of the variance in overall drug use. Results suggest that homeless adolescent drug use exists at high levels and is related to parental monitoring and peer modeling of

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other risk behaviors. These results may inform future prevention strategies for homeless youth and other high-risk populations.

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## 1. Introduction

It is estimated that, in the United States, 300,000 youth are homeless (National Coalition for the Homeless, *Homeless Youth*, 1999); the annual prevalence of homelessness is at least 5% among youth aged 12–17 (Robertson & Toro, 1998). In California, estimates indicate that 35,000–100,000 children/adolescents are homeless, which constitutes 10–38% of the homeless population in the State (California Office of the Governor, March 2002). In San Diego County, approximately 800 youth are homeless at any given time (Regional Task Force on the Homeless, Youth and Homelessness, 1997), with only 202 shelter beds set aside (Regional Task Force on the Homeless, *Homeless Service Profile*, 2001). This leaves a substantial number of youth who are forced to live on the streets, “squat” in abandoned buildings, or sleep on the beach.

Substance use has been shown to be related to health risks in youth (Grunbaum, Tortolero, Weller, & Gingiss, 2000; Huba & Melchior, 2000). It is reported that 75% of homeless youth use drugs because they believe it keeps them warm and/or suppresses their appetite (Regional Task Force on the Homeless, Youth and Homelessness, 1997). Research has shown that rates of drug use are much higher among homeless adolescents than among other youth (Kipke, Montgomery, & MacKenzie, 1993; Klein, Woods, Wilson, Prospero, Greene & Ringwalt, 2000). Huba and Melchior (2000) reported that homeless male and female youth have 2.27 and 1.75 greater odds of substance use, than do their respective non-homeless counterparts.

A paucity of literature exists on the determinants of homeless adolescents' substance use. Current research has primarily focused on the prevalence of homeless adolescent substance users and their service needs (Kipke et al., 1993; Klein et al., 2000). Descriptions of the problem and a framework from which determinants can be assessed have been presented (Robertson & Toro, 1998; Whitbeck & Hoyt, 1999); however, only a few studies have identified possible determinants (Ennett, Bailey, & Federman, 1999; Hawkins, Catalano, & Miller, 1992; Swadi, 1999). Attempted suicide, history of sexual and physical abuse, “survival sex”, sexual orientation, lack of a social network, and long periods of homelessness have been found to be associated with substance use in homeless adolescents (Ennett et al., 1999; Kipke et al., 1993).

Many studies have investigated risk factors associated with substance use in non-homeless youth. Peer influences have been the most consistently reported positive predictors (Hawkins et al., 1992; McCuller, Sussman, Dent, & Teran, 2001; Sullivan & Farrell, 1999; Swadi, 1999). Violence/crime (Huba & Melchior, 2000; Sullivan & Farrell, 1999), poor school performance (Grunbaum et al., 2000; Sullivan & Farrell, 1999), and family conflict (Brook,

Brooke, De La Rosa, Duque, Rodriguez, & Montoya, 1998; McCuller et al., 2001; Ellickson & Morton, 1999) have also been shown to be significantly related to increased substance use in youth.

A number of factors have also been reported as being significantly negatively related to youth substance use. These include religiosity (Grunbaum et al., 2000; McCuller et al., 2001), parental monitoring (Griffin, Botvin, Scheier, Diaz, & Miller, 2000; Li, Feigelman, & Stanton, 2000), and physical activity (Collingwood, Sunderlin, Reynolds, & Kohl, 2000). Inconsistent findings have been reported for self-esteem (Brook et al., 1998; Grunbaum et al., 2000), depression (Grunbaum et al., 2000; McCuller et al., 2001; Sussman, Dent, & Leu, 2000), and coping (Grunbaum et al., 2000; Sussman et al., 2000). These results may be attributed, in part, to the lack of a “gold standard” and to inconsistencies in the measurement of these constructs.

To date, no studies have examined both potential risk and protective factors for substance use in homeless youth. Given the high rates of substance use found in this population, and the increasing numbers of children and adolescents becoming homeless each year, it is critical that potential predictors of substance use in homeless youth are investigated.

In addition, the majority of the data on youth substance use has been collected using face-to-face or paper-pencil methods. These approaches may introduce biases via the interviewer or participant. Face-to-face interviews may be vulnerable to social desirability bias (Bloom, 1998); paper-pencil surveys may be complicated by literacy issues. Both methods may raise concerns about the lack of privacy for respondents, which, in turn, may lead to false reporting.

Recently, computer-based surveys have been used to attempt to reduce these types of errors. Audio-computer-assisted Self-interviewing (A-CASI) allows for the collection of sensitive information without the direct participation of an interviewer (Turner et al., 1998). Several studies (Macalino, Celentano, Latkin, Strathdee, & Vlahov, 2002; Murphy, Durako, Muenz, & Wilson, 2000) have used A-CASI to assess HIV-related risk behavior in adolescents and adults and have found higher rates of risk behaviors compared with those using face-to-face interviews. While conclusive evidence of increased accuracy of reporting with A-CASI has not yet been demonstrated, its potential for reducing possible biases merits further investigation. To date, no studies have used A-CASI in any homeless youth population. The purpose of the present study is to investigate potential risk and protective factors of substance use in homeless youth, using data collected with A-CASI technology. Learning theories were used as the theoretical bases for inclusion of the potential predictors examined.

## 2. Methods

### 2.1. Design

This study was part of a larger investigation designed to evaluate four youth drop-in centers in Southern California. These centers offered a variety of training/support services,

referrals to schools and health/social services, recreational activities, and, in addition, focused on HIV risk reduction. The San Diego State University Institutional Review Board approved all measures and procedures for this study. A Federal Certificate of Confidentiality (No. MH-00-177) was obtained to protect the participants. For the present study, baseline data obtained from two drop-in centers were used to explore possible predictors of substance use among homeless youth. Both of the centers' target populations included homeless youth, and one of the centers additionally provided services to youth identifying as gay, lesbian, bisexual, or transgender.

### *2.2. Screening and recruitment*

Drop-in center staff referred potential participants to a trained research assistant (RA) for screening and recruitment. Youth were eligible to participate if they were aged 14–24 and had attended their drop-in center less than three times. The screening and recruitment process took approximately 15 min and included informed consent/assent. For participants under the age of 18, parental consent was obtained via mail; however, parental consent was waived if obtaining such consent would put the youth at risk for verbal or physical abuse.

### *2.3. Participants*

A total of 113 homeless youth was recruited. Participants were considered to be homeless if they were without a home or considered themselves to be homeless at the time of the interview. The sample was 55.4% male and 48.2% Caucasian, 20.5% Latino(a), 14.5% African-American, 4.8% Native American, 1.2% Middle Eastern, and 10.8% other. The mean age of the participants was 17.8 years (S.D.=2.24), and the mean number of years of education completed was 10.43 (S.D.=1.73). Nearly half (46%) reported earning money for themselves and the mean income was US\$241.02 (S.D.=216.89) per week.

### *2.4. Procedures*

Participants completed (using A-CASI technology) a 30-min survey, regarding HIV/STD-related risk behavior, drug use, violence, peers, family, sexual activity, and service utilization. These surveys were conducted on laptop computers, using headphones and a mouse, and QDS version 2.0 software (Nova Research, 2001). Range and validity checks were programmed into the administered survey. Written definitions of terms used in the interview were given to each participant. A trained RA was always present to answer questions and to assist with difficulties using the A-CASI. To protect privacy, this RA was stationed at a distance, where it was not possible to see the computer screen. Upon completion of the interview, all participants received a US\$15 gift certificate to a local music store. The data obtained from each interview were saved to a disk and later transferred to a central database.

## 2.5. Measures

The survey used for the larger study was developed to evaluate the participating youth drop-in centers. For the present study, individual items and/or scales regarding alcohol and drug use, demographics, violence, family, and peers were used to explore possible predictors of substance use. Most individual items used Y/N formats (yes=1, no=0) or three-point ordinal scales with explicit anchors (e.g., never=0, sometimes=1, and always=2).

### 2.5.1. Dependent variable: substance use

Survey Y/N questions asked respondents about their lifetime and past 3-month use of the following substances: tobacco, alcohol, marijuana, methamphetamine, ecstasy, and inhalants. Overall scores were created for lifetime and past 3-month drug use by summing all substances. Overall drug scores ranged from 0 to 6, with higher scores indicating greater number of drugs used. The primary dependent variable was overall drug use for the past 3 months.

### 2.5.2. Independent variables

Other than demographics, all independent variables assessed the past 3 months. Three additive scales were created to represent peer pressure to use alcohol/drugs, peer modeling of weapon use and/or jail time, and the number of times the participant was suspended and/or expelled. The peer pressure scale was created using two Y/N items: “During the past 3 months has a friend tried to get you to drink alcohol when you didn’t want to?” and “During the past 3 months has a friend tried to get you to use drugs when you didn’t want to?” This scale (Cronbach’s  $\alpha=0.64$ ) ranged from 0 to 2, with high scores indicating more peer pressure to use alcohol/drugs. The peer modeling scale contained two Y/N items assessing peers’ jail time and weapon carrying, adapted from the Youth Risk Behavior Survey (Centers for Disease Control, 2001). This scale ( $\alpha=0.69$ ) ranged from 0 to 2, with high scores indicating more negative peer modeling. A third scale was created using two items representing the raw number of times suspended and expelled from school, respectively. Prior to scaling, both items were corrected for skewness using a natural log transformation. The final scale ( $\alpha=0.57$ ) combined the two transformed variables and was used in all inferential analyses.

Additional independent variables were individual items assessing parental monitoring, vigorous exercise, and school status, as well as age, gender, and ethnicity. The parental monitoring question used a three-point ordinal scale (*never* through *always*) and asked participants how often their parent(s) knew where they were and who they were with. Vigorous exercise was measured as the number of days in the past 90 days in which participants engaged in activity that produced heavy sweating or a large increase in breathing for duration of at least 10 min. A Y/N school status measure was used to determine if participants were currently attending school.

## 2.6. Statistical analyses

All analyses were conducted using SPSS version 10.0 (SPSS, 2000). Descriptive statistics were used to examine the frequency of lifetime and 3-month reported use of alcohol and

drugs. Bivariate correlational analyses were used to identify sociodemographical factors associated with substance use. An hierarchical multiple regression analysis was conducted to determine which hypothesized risk and protective factors predicted overall drug use during the past 3 months after adjusting for basic demographics. Using the same hierarchical model, an exploratory regression analysis was conducted for lifetime overall drug use. Regression diagnostics were performed to test for collinearity, outliers, and the overall fit of the models.

### 3. Results

#### 3.1. Frequency of substance use

The frequencies of lifetime and 3-month drug use are presented in Table 1. Almost 96% (95.6%) of the sample reported use of at least one drug in their lifetime (80.5% excluding tobacco and alcohol). Over three quarters (75.2%) of the youth reported the use of three or more drugs, and 31.0% reported the use of five or more drugs in their lifetime. The mean number of lifetime drugs used was 3.55 (S.D.=1.64). The most commonly reported drugs ever used were alcohol (89.4%), tobacco (85.8%), and marijuana (77.0%).

In the past 3 months, 84.1% of the participants used at least one drug (64.3% excluding tobacco and alcohol). Just over half (54.1%) of the youth reported the use of three or more drugs, and 2.7% reported the use of five or more drugs in the past 3 months. Similar to lifetime use, tobacco (72.6%), alcohol (70.8%), and marijuana (56.6%) were the most

Table 1  
Lifetime and 3-month substance use

	Lifetime % (n)	3-month % (n)
<i>Drug</i>		
Alcohol	89.4 (101)	70.8 (80)
Tobacco	85.8 (97)	72.6 (82)
Marijuana	77.0 (87)	56.6 (64)
Methamphetamine	47.8 (54)	23.0 (26)
Ecstasy	34.5 (39)	4.4 (5)
Inhalants	21.2 (24)	7.1 (8)
<i>Number of drugs used</i>		
0	4.40 (5)	15.9 (18)
1	8.80 (10)	12.4 (14)
2	11.5 (13)	17.7 (20)
3	21.2 (24)	31.9 (36)
4	23.0 (26)	19.5 (22)
5	17.7 (20)	2.7 (3)
6	13.3 (15)	0.0 (0)

frequently reported drugs used during the past 3 months, although tobacco was the most commonly reported drug used during this time period.

### 3.2. Predictors of substance use

Table 2 provides descriptive statistics for the primary dependent variable, overall drug use during the past 3 months, as well as the nine independent variables in the hierarchical multiple regression model. The mean number of reported drugs for the past 3 months was 2.34 (S.D.=1.41). Over half (51.3%) of the youth were currently attending school, and on average, the youth reported nearly eight lifetime suspensions/expulsions.

Results from the 3-month overall drug use hierarchical multiple regression analysis are reported by block in Table 3. Age, gender, and ethnicity were entered into the first block and significantly accounted for 19% of the variance in 3-month drug use [ $F(5,106)=4.94$ ,  $p<.01$ ]. Identifying as African-American ( $p<.01$ ) was the only significant (–) variable in Block 1.

The second block included one variable that measured the frequency of parental monitoring and significantly (–) explained an additional 4.5% of the variance [ $\Delta F(1,105)=6.16$ ,  $p<.05$ ]. Participants with greater parental monitoring reported lower levels of drug use.

Table 2  
Overall drug use and potential determinants of drug use during the past 3 months

Variable	%	Mean	S.D.	Range
<i>Primary outcome variable</i>				
3-month drug use	na	2.34	1.41	0–5
<i>Independent variables</i>				
Age	na	17.83	2.24	14–24
Gender				
Male	61.1	na	na	na
Ethnicity				
White	41.6	na	na	na
Black	18.6	na	na	na
Hispanic	23.9	na	na	na
Other	15.9	na	na	na
School status				
Attending	51.3	na	na	na
Peer pressure	na	0.35	0.65	0–2
Suspended/expelled <sup>a</sup>	na	7.60	13.0	0–55
Peer weapon/jail	na	0.86	0.87	0–2
Parental monitoring	na	0.95	0.68	0–2
Vigorous exercise	na	10.51	20.2	0–90

<sup>a</sup> The tabled descriptive information for the suspended/expelled scale is from the original data combining the raw numbers of times suspended and expelled. For analytical purposes, to correct skewness, the scale was transformed using the natural logarithm (mean=1.39, S.D.=1.17, range=1–4.03).

Table 3

Determinants of overall drug use during the past 3 months: contributions of each variable block to changes in  $R^2$ 

Determinant	$R^2$	$\Delta R^2$	$F$	$df$	$\Delta F$	Significance $\Delta F$
Block 1: Demographics	0.189	0.189	4.94	5,106	4.94	0.000
Block 2: Parenting	0.234	0.045	5.34	6,105	6.16	0.015
Block 3: Peers and environment	0.362	0.128	5.15	11,100	4.01	0.002

An hierarchical multiple regression strategy was used in which blocks of variables were added to the regression equation sequentially.  $R^2$ ,  $F$ , and  $df$  refer to the overall regression equation after each block has been entered into the model;  $\Delta R^2$ ,  $\Delta F$ , and significance  $\Delta F$  describe the contributions of each individual block.

Block 3 added peer pressure, peer weapon carrying/jail time, school attendance, history of suspension/expulsion, and exercise and explained an additional significant 13% of the variance in 3-month drug use [ $\Delta F(5,100)=4.01$ ,  $p<.01$ ]. Having peers that carry weapons and/or have been incarcerated ( $p<.01$ ) was the only significant (+) variable in Block 3.

Summary statistics for the complete model are presented in Table 4. The final regression model accounted for a significant 36% of the explained variance in 3-month drug use [ $F(11,100)=5.15$ ,  $p<.001$ ]. Parental monitoring ( $p<.05$ ) and peer weapon carrying and/or incarceration ( $p<.01$ ) remained significantly related to 3-month drug use in the complete model.

An exploratory multiple regression analysis was conducted testing the same hierarchical model with lifetime drug use. Despite the confound of using variables assessing 3 months to predict lifetime substance use, results were virtually identical to those found in the model testing 3-month drug use (other than slight differences in the values obtained). Overall lifetime drug use was also significantly correlated ( $r=.76$ ,  $p<.01$ ) with overall 3-month drug use.

Table 4

Final stage in the hierarchical multiple regression of overall drug use during the past 3 months ( $N=113$ )

Determinant	B	S.E.	$\beta$	$t$	$p$
Gender	-0.225	0.256	-0.078	-0.878	.382
Age	0.041	0.063	0.066	0.650	.517
White	0.044	0.336	0.015	0.131	.896
Black	-0.591	0.410	-0.160	-1.441	.153
Hispanic	-0.119	0.386	-0.036	-0.308	.759
Parental monitoring	-0.451	0.185	-0.215	-2.433	.017
School attendance	-0.508	0.275	-0.180	-1.846	.068
Peer pressure	0.144	0.198	0.067	0.731	.466
Suspended/expelled	0.104	0.106	0.086	0.973	.333
Peer weapon/jail	0.456	0.153	0.279	2.972	.004
Vigorous exercise	0.094	0.156	0.053	0.599	.550
(Constant)	1.808	1.381		1.309	.193

The table describes the complete model with all blocks entered. Statistics in the columns are unstandardized regression coefficients (B), associated standard errors (S.E.), standardized regression coefficients [betas] ( $\beta$ ), significance tests of each variable in the model ( $t$ ), and associated  $p$  values ( $p$ ).

#### 4. Discussion

The purpose of this study was to examine potential psychosocial determinants of substance use in homeless adolescents. Determinants were based on learning theories, with emphasis on adolescent high-risk behavior. This study was part of a larger evaluation designed to evaluate drop-in centers. This delimited the resources available for examining potential predictors of substance use. Thus, this analysis is a conservative test of learning theory-based predictors. Nonetheless, our results help inform the identification of homeless youth at greatest risk for substance use, support further in-depth study of the possible determinants of substance use based on learning theory, and should help guide prevention intervention development.

Consistent with previous findings regarding homeless youth, our results indicate high rates of substance use, with a relatively high proportion of our sample using multiple drugs. A majority of our participants reported polysubstance use both in their lifetime and in the past 3 months. Alcohol, tobacco, and marijuana were shown to be the most prevalent drugs used for both time periods measured. Interestingly, the rates of use of alcohol, tobacco, and marijuana reported in the past 3 months were only moderately different from those reported for lifetime. This may suggest easier access to these drugs relative to the other drugs being examined and/or imply possible addiction to these substances.

An hierarchical multiple regression model was used to examine the theoretical determinants of overall 3-month substance use. Although not retained in the final model, in Block 1, identifying as African-American was negatively related to 3-month drug use, which reflects findings in the current literature (McCuller et al., 2001; Ellickson & Morton, 1999). A recent report (San Diego Association of Governments, 2003) revealed declining rates of drug use among African-American juveniles in San Diego. This suggests that homeless African-American youth in San Diego may have benefited from exposure to drug prevention and intervention measures. However, future research utilizing a more rigorous model is needed to address this issue.

Block 2, representing parental monitoring, added significantly to the explained variance in 3-month drug use. Youth reporting greater parental monitoring were less likely to report drug use in the past 3 months. This relationship remained significant in the complete model and is consistent with recent findings regarding at-risk and minority youth (Griffin et al., 2000; Li et al., 2000). Although homeless youth inherently receive little parental contact, results suggest that parental monitoring may act as a deterrent to drug use. It is also possible that the youth in this study generalized the term “parental” to include individuals such as counselors, teachers, or drop-in center staff who regularly play a parental role in their life. Future studies of homeless youth should examine this relationship more completely.

The final block reflected peer and environmental influences, including peer pressure, peer weapon carrying and incarceration, school suspension/expulsion, and exercise. Youth reporting contact with peers who carry weapons and/or have been incarcerated were more likely to report past 3-month drug use. This finding suggests that peer modeling of one or more deviant behaviors may generalize to drug use behavior. This modeling and generalized imitation of behavior suggests a need for interventions that focus on reinforcement and modeling of healthy alternative behaviors (e.g., sports, art). Further investigation should focus

on the generalizability of other risk behaviors on drug use and examine the temporal order of these relationships.

Homeless youth who lack parental monitoring and have peers who carry weapons and/or have been incarcerated should be considered at high risk for drug use. Conversely, our findings suggest that homeless youth with more parental monitoring and little or no contact with weapon carrying and/or formerly incarcerated peers are less likely to engage in drug use. In addition, those homeless youth attending school or identifying as African-American may have a reduced likelihood of drug use; however, these factors were not statistically significant in the full model, possibly resulting from a small study sample. It also should be noted that the sample was not recruited using probability sampling and consisted of homeless youth who had utilized drop-in centers. Thus, the possibility that differences exist between homeless youth who utilize a drop-in center and those who do not may limit generalizability to other homeless youth populations.

The amount of information on homeless youth and their substance use behavior is very limited. It is incorrect to assume that homeless and non-homeless youth share the same risk factors for substance use; doing so is detrimental to programs serving homeless adolescents. Future studies should be designed to increase sample size and use a more comprehensive list of potential risk factors associated with drug use in homeless youth. Doing so may provide a more complete picture of homeless youth drug use behavior and advance future prevention efforts.

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