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DRUG RISK: A CROSS-SECTIONAL EXPLORATION OF THE INFLUENCE OF FAMILY-OF-ORIGIN AND CURRENT SITUATIONAL CIRCUMSTANCES¹

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Abstract

The main objective of this paper is to investigate potential predictors of drug risk among a community-based sample of individuals who are exposed to illicit drugs. The four domains of interest are individual socio-demographic and social-psychological attributes, current situational circumstances and family-of-origin characteristics. Interviews were conducted with 242 individuals who were recruited in Atlanta, Georgia. Initial descriptive analyses were followed by multivariate analyses. The final model predicted 60% of the variance in drug risk. Current situational circumstances were statistically significant regarding drug risk. Family-of-origin characteristics also were significant, even when entered into the predictive model after current situational circumstances. In addition to individual social-psychological characteristics such as depression and self-esteem, the impact of childhood emotional abuse is noted. The findings indicate a need for considering proximal as well as more distal influences on drug risk behavior when designing drug use prevention and intervention programs.

INTRODUCTION

Individuals who are exposed to illicit drugs, including users, show a greater propensity to become users, and subsequently to experience negative drug-related social and health consequences, as compared to those who are unexposed (Braine, et al.; Essien et al., 2004; Ford & Beveridge, 2004; Latkin, Curry, Hua, & Davey, 2007). The exposure thesis builds on earlier criminological theories of differential association (Sutherland & Cressey, 1955), supplemented by those who emphasize strain caused by social disadvantages and the lack of opportunities for upward social mobility (Merton, 1938; Agnew, 1999, 2005).

There seems to be consensus that the link between drug exposure and subsequent drug risk is complex. Self-control theory (Gottfredson & Hirschi, 1990; Hirschi & Gottfredson, 1994) postulates that individuals who have low self-control are more likely to engage in illegal behaviors, including drug use, than those with higher self-control. Unfortunately, the self-control paradigm does not consider shifts in individual self-control throughout the life course (Akers 1991; 2000; Laub & Sampson 2003). Social control theory (Hoffman 2003; Kierkus & Baer 2002; Sorenson & Brownfield 1995) emphasizes that inadequate social bonds, including low parental attachment and lack of family stability, create weak networks

¹Whereas mediation implies a chain of relations among three variables (an independent variable *x* causes a mediator *M* and the mediator causes the dependent variable), a moderator implies an interaction effect (the effect of *X* on *Y* depends on the level of a third variable). For a detailed explanation of the difference between a mediation effect and a moderator effect see Baron and Kenny (1986).

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of social control, thereby increasing the likelihood of criminal involvement, including drug use (Alarid, Burton & Cullen, 2000). Again others stress the importance of social learning and link negative childhood learning experiences to subsequent criminal involvement, including drug use (Farrington, Barnes & Lambert, 1996; Fergusson, Swain-Campbell & Norwood, 2004). Following Akers' (2000:240) suggestion of "integration by conceptual absorption," in this paper we build on these various paradigms by considering current situational circumstances, early life course experiences, specifically family-of-origin characteristics, and individual attributes.

Extensive research shows a link between current situational circumstances and drug risk (Brook, Brook, Gordon, Whiteman & Cohen, 1990; 2006; Jessor, 1991; Jessor & Jessor, 1977). For example, negative peer influences have been shown to increase involvement in deviant activities, including drug use (Brook, Pahl, Morojele, & Brook, 2006; Jessor, 1991; Jessor & Jessor, 1977; Osgood, Wilson, Bachman, O'Malley, & Johnston, 1996; Sanchez, Chitwood, & Koo, 2006). Other drug-related situational factors that have been identified include crime, criminal justice involvement, and participation in various illegal income-generating activities (Debeck et al., 2007; Osgood et al., 1996; Newcomb, Galaif, & Carmona, 2001). In addition, tobacco and alcohol use have been identified as yielding subsequent illicit drug use (Weitzman & Chen, 2005; Weden & Zabib, 2005).

In addition to current circumstances, family-of-origin characteristics have been linked to drug risk, specifically family structure (Argys, Rees, Averett, Witoonchart, 2006; Barret & Turner, 2006; Reinhertz et al., 2000) and family processes (Conger, Patterson & Ge, 1995; Brook et al., 2007; Dube et al., 2003; Hoffman & Cerbone, 2002; King & Chassin, 2004; Stein, Leslie & Nyamathi, 2002). Childhood neglect and abuse also have been linked to drug risk (Klein, Elifson, & Sterk, 2007; Miller & Mancuso, 2004; White & Widom, 2008; Widom et al., 2006). Some pose that parental drug use may be a form of childhood maltreatment that increases drug risk (Chapple, Hope, & Whiteford, 2005; Dunn et al., 2002; Fagan & Najman, 2005; Goldsmith & Freyd, 2005; Iwaniec, Larkin, & Higgins, 2006; Windle, 1996).

Though evidence indicates that some family of origin characteristics may not influence substance use directly, few studies have investigated potential mediators of these relationships (Barret & Turner, 2006; Stein et al., 2002; Stuewig & McCloskey, 2005). Some research indicates that low self-control and internalizing problems, such as depression, are important mechanisms through which family factors may influence drug use (Chapple, Hope, & Whiteford, 2005; Stein et al., 2002). Negative self concept, resulting in low self esteem and lack of self determination, is another adverse outcome often linked with parental maltreatment and the propensity to use drugs (Amaro, Blake, Schwartz, & Flinchbaugh, 2001; Brook et al., 2007; Connor, Poyrazli, Ferrer-Wreder, & Grahame, 2004; Epstein, Griffin, & Botvin, 2004). However, these associations are understudied and not well understood, especially with regard to adult behavior (Hussong, Curran, & Chassin, 1998). For example, a recent study of 581 homeless women residing in shelters in Los Angeles showed that parental substance use had a strong direct effect on drug and alcohol problems among this adult population, whereas other forms of abuse, including physical and sexual abuse, influenced substance use indirectly through lower self esteem and recent victimization (Stein, Leslie & Nyamathi, 2002).

While a substantial body of research links low self-esteem and low self control (or sensation-seeking) to drug use (Donehew et al., 1999; Hofman & Cerbone, 2002; Sterk, Klein & Elifson, 2004), the evidence for other social-psychological factors, such as depression, is inconsistent (Ilomaki et al., 2004; Turner, 2003). Some research indicates that these effects may vary according to certain personal characteristics, such as age, race, and

gender, but these findings are not conclusive (Hussong et al., 1998; Kaukinen & DeMaris, 2005; Pedersen, 1991; White & Widom, 2008). Extensive evidence shows that adolescent women overall tend to have lower self-esteem as compared to their male counterparts. Consequently, they are at greater risk of becoming drug users (Epstein, Griffin, & Botvin, 2004). However, recent research into gender differences in self esteem among young adults indicates that men who have been exposed to multiple forms of childhood violence may be more vulnerable than women who are exposed to the same level of violence (Shen, 2009).

In this paper, we investigate the relative contribution of four types of predictors hypothesized to influence drug risk: socio-demographic characteristics, current situational characteristics, family of origin characteristics, and social-psychological characteristics. Based on the literature presented, we hypothesize that: (1) current situational circumstances will be the most salient predictors of drug risk, (2) family of origin characteristics will explain a smaller portion of the variance above and beyond situational characteristics, and (3) social-psychological attributes will have a direct effect on drug risk and also, to some extent, mediate or attenuate the effect of family of origin characteristics on drug risk. Although we expect certain socio-demographic characteristics (e.g., gender and age) to moderate ¹ the relationship between social-psychological characteristics and drug risk, because previous research is inconclusive, we made no hypotheses regarding the direction of these effects.

METHODS

STUDY PROCEDURES

This paper focuses on 242 adults who were part of a larger cross-sectional, community-based research study on intergenerational dynamics that explored topics such as family socialization, childhood experiences and their impact on adult functioning, physical and mental health, and drug use. Respondents for this study were recruited between September 2002 and August 2006 in Atlanta, Georgia. Inclusion criteria included being a resident in the Atlanta metropolitan area, being age 18 or older, and being able to conduct the interview in English since non-English speakers are uncommon in the study area. In order to ensure that a non-institutionalized sample was selected, we also excluded persons who had been institutionalized (e.g., in jail, prison or drug treatment) during the 30 days preceding the interview.

As is typical in community-based studies, the initial recruitment phase entailed a windshield survey and ethnographic mapping to identify the physical environment (e.g., location of schools, social and health service agencies, stores and businesses) and the social environment with a specific focus on the level of social activity, the type of social activity (e.g., formal gathering, social gathering). In order to have background information on topics of interest such as drug use and crime, we reviewed available data from a wide range of agencies (e.g., health care providers and law enforcement) (Tashima, Crain, O'Reilly & Sterk-Elifson, 1996; Sterk, 1999). Targeted sampling was employed to ensure the inclusion of a wide representation of individuals. This sampling was complemented with chain referral and theoretical sampling (Glaser & Strauss, 1967; Kaplan, Korf & Sterk, 1986; Strauss & Corbin, 1998). This mix of sampling strategies has shown to be effective in community-based studies for the recruitment of respondents from a wide range of settings to ensure representativeness of the sample. Contrary to quota sampling, which assumes that the main

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characteristics relevant to the sampling frame are known a priori, theoretical sampling is driven by knowledge that is acquired as part of the recruitment process.

The study staff was given alternative instructions on sites and types of respondents as additional information emerged. Additional recruitment locations, for example, were explored as the field staff learned of new locations in which respondents tended to gather in groups versus those areas known as isolate hangouts. Less than three percent of the eligible respondents declined participation, most often due to lack of ability to commit to an interview time. Eligible and invited individuals who did not participate were similar to those who did in terms of the recruitment location, area of residence, and socio-demographic characteristics.

Data collection involved computer-assisted, structured interviews. Interviewers were available for the respondents to complete computer-assisted interviews. The interview staff was diverse in terms of gender, race, and age and was systematically assigned to respondents in order to reduce interviewer bias. The average length of time to complete the interviews was approximately two hours (range from 1 to 3.5 hours). Respondents were reimbursed \$25 for their participation. Upon approval by the university institutional review board, a federal Certificate of Confidentiality was obtained for the study.

MEASURES

Data were collected using an instrument developed specifically for the study, based on findings from our previous research (see for example, Elifson, Klein, & Sterk, 2006; Klein, Elifson, & Sterk, 2003; Sterk, Theall, and Elifson, 2006; Theall, Elifson, Sterk, & Klein, 2003). The instrument included several established scales, as referenced in the text below, as well as items drawn from instruments shown to produce both valid and reliable results from drug users such as the risk behavior assessment (RBA), the Addiction Severity Index (ASI), and the DSM-IV partial substance abuse module (SAM) (Coyle, 1998; McLellan, 1985). These measures, which are based on self reports, exhibit excellent face validity and have good internal consistency, as indicated below.

Dependent variable—*Drug risk* was assessed using a newly constructed 11-item dichotomous (yes/no) scale that demonstrated good reliability (Kuder-Richardson (KR_{20}) = .77.)² and validity³ in the current study. Scale items were derived from findings of our previous research (see for example, Elifson, Klein, & Sterk, 2004; Theall, Elifson, Sterk, & Klein, 2003) and gauge problems associated with drug use, such as family dysfunction, as well as situational factors that may influence initial substance use or increased use, such as living with a drug user, and other health and safety risks. Scores on this measure range between 0 and 11, with higher scores representing greater risk. Items included: experienced drug-related problems with family, past 30 days; experienced drug-related problems with friends, past 30 days; experienced drug-related legal problems, past 30 days; involved in fights resulting from drug use, past 30 days; used drugs with strangers, past 30 days; used drugs with a dealer, past 30 days; used drugs in risky settings, such as a crack house, shooting gallery, abandoned building, car, or outdoors (past 30 days); engaged in poly-drug

²The Kuder-Richardson (KR_{20}) internal consistency reliability coefficient is equivalent to Cronbach's alpha and is appropriate for use with dichotomous items.

³We used both exploratory (EFA) and confirmatory (CFA) factor analyses in the Mplus program (Muthen & Muthen, 1998-2007) to evaluate the factor structure underlying these items using tetrachoric correlations, which are treated as having an underlying continuous scale. Results from EFA indicated a one-factor solution with all loadings > .53 and an eigenvalue of 5.8. CFA supported the one-factor solution (RMSEA = .06; CFI = .97; TLI = .97) and provided evidence of construct and factorial validity. Model fit statistics are consistent with suggested cut off values for the Root Mean Square Error of Approximation (RMSEA) of .06 and cut off values of > .95 for the Comparative Fit Index (CFI) and the Tucker Lewis Index (TLI) (Hu & Bentler, 1999). Multiple group CFA showed no significant differences across gender, providing further evidence of construct and factorial validity.

use (using more than one drug in the past 90 days); lived with a drug-user, past year; traded sex for food, money, or drugs, past year; and sold, distributed, or helped to make drugs, past year.

Independent variables—The independent variables cover four domains: (1) socio-demographic characteristics; (2) current situational characteristics; (3) family-of-origin characteristics; and (4) social-psychological characteristics.

Socio-demographic characteristics: These variables included: *gender*, *age*, *racial background* (white/non-white), *education* (years in school), *personal income* (wages from legal employment, past 90 days), *relationship status* (cohabiting/not cohabiting), and whether the respondent had any *children* (yes/no).

Current situational characteristics: *Tobacco and alcohol use* was a dichotomous (yes/no) measure of use in the past 7 days. *Recent criminal justice involvement* (arrested, charged, and booked on a charge in the past year) was a dichotomous (yes/no) variable and *revenue from illegal activities* was based on a continuous measure of income from non-legal activities in the past 90 days. *Involvement in criminal activities* was assessed using a dichotomous (yes/no) measure ($KR_{20} = .78$) and was based on reported offending over the past year. It included the following 13 items: purposely destroyed property, past year; passed bad checks, forged or altered prescriptions, past year; took money from a store; broke into a building; stole a car; used a weapon or strong arm method to get something; hit someone, or got into a physical fight; hurt somebody bad enough that they needed medical care; used a gun or knife to get something; forced someone to have sex; involved in death or murder of someone; involved in arson; and member of a gang, past year. *Association with deviant peers* was measured using a dichotomous (yes/no) measure ($KR_{20} = .88$) and was based on reported associations that occurred over the past year. It included the following 16 items: had friends who purposely destroyed property; had friends who passed bad checks, forged or alters prescriptions, took money; had friends who took money from a store; had friends who, other than from a store, took money; had friends who broke into a building; had friends who stole a car; had friends who used a weapon, or strong arm method to get something; had friends who hit someone, or got into a physical fight; had friends who hurt someone badly enough that they needed medical help; had friends who used a gun or knife to get something; had friends involved in the death or murder of someone; had friends who drove a vehicle under the influence; had friends involved in arson; had friends who sold, distributed, or helped to make drugs; had friends who traded sex for food, money, or drugs; and had friends who were members of a gang.

Family-of-origin characteristics: Due to large amounts of missing data on fathers, we limit parental drug use to that among mothers.⁴ *Maternal drug use* was assessed by asking the respondents if they knew their mother to have had a drug problem while they were up (yes/no). Measures of *parental neglect* and *emotional abuse* were derived from the Childhood Trauma Questionnaire (Bernstein *et al.*, 1994). The items were scored as “never true,” “rarely true,” “sometimes true,” “often true,” or “very true.” We used five items to measure *parental neglect*, including not having enough to eat, parents too drunk or high to take care of family, having to wear dirty clothes, lack of adequate medical care, and an overall lack of parental care and protection (Cronbach's alpha = 0.76). *Emotional abuse* was measured using 4 items, including being called “stupid,” “lazy” or “ugly” by family members, believing that one's parents wished they had not been born, having family members say

⁴A large percentage (70%) of participants reported living in female-headed households while growing up (defined as before the age of 18) and almost one-half (47%) reported having no contact with their biological father during this time.

hurtful and insulting things, and feeling hated by someone in the family (Cronbach's alpha = 0.78).

Social-psychological characteristics: *Self-esteem* was based on the ten item Rosenberg (1965) Self-esteem Scale, used to measure general feelings of self worth. Scores ranged from 1 to 50, with higher scores representing higher levels of reported self-esteem (Cronbach's alpha = 0.83). Indicators of *depression* were derived from an abbreviated 8-item version of the 20-item Center for Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977). The abbreviated version has exhibited a high correlation with the original 20-item CES-D (Cronbach's alpha = .93). Possible scores range from 0 to 24, with higher scores reflecting more depressive symptoms (Cronbach's alpha = 0.85). *Lack of self-determination* was assessed using the 12-item Social Life Feeling Scale (Cronbach's alpha = 0.71) (Schuessler, 1982). Responses were scored on a 5-point scale, ranging from 0 "never true" to 4 "very often true," with higher scores indicating more perceived doubt regarding self-determination. *Low self-control or sensation seeking* was captured with ten categorical items (strongly disagree to strongly agree, 1 to 5) derived from the 20-item Impulsive Sensation-Seeking subscale of the Zuckerman-Kuhlman Personality Questionnaire Form III (Zuckerman et al., 1993). Possible scores range from 20 to 100, with higher scores representing lower levels of self-control (Cronbach's alpha = 0.89).

ANALYSIS—STATA 10.0 software (StataCorp, 2007) was used to estimate a series of regression equations predicting drug risk. Because this study included family members, observations were non-dependent. Therefore, we used the Huber-White Sandwich estimator, a regression-based technique in STATA, which takes the correlation of error terms between individuals within the same family into account to obtain robust standard errors (Rogers, 1993; Williams, 2000).

Hypothesized mediating effects were tested individually and jointly (Baron and Kenny, 1986). Evidence of a multiple mediated association was determined if more than one mediating variable was significantly associated with drug risk when entered into the model simultaneously and each mediator was shown to contribute uniquely and significantly to the reduction of the effect of family-of-origin characteristics on drug risk. Statistical significance was established using the Sobel-Goodman mediation test in STATA. Finally, to determine whether various socio-demographic variables, such as gender and age, moderated the relationship between the hypothesized mediators and drug risk, we computed and tested for two-way interactions between these variables.

Prior to conducting multivariate analyses, Pearson correlations were computed and the findings showed that none of the independent variables were highly correlated ($r > .45$). We also used the variance inflation factor (VIF) test to rule out multicollinearity. Because family size and family structure had no influence on drug risk in preliminary analysis and showed little association with the other hypothesized predictors, we excluded these two variables as predictors in subsequent analyses. Other theoretically relevant predictors were excluded due to a lack of cases. For example, only four participants in this sample reported living in unstable living conditions (e.g., living on the street or in a car, shelter, or boarding house) and only five reported injecting drugs in the past 90 days. Physical and sexual abuse exhibited low predictive power and were excluded prior to fitting the final models.⁵ Because

⁵Physical abuse was significantly correlated with drug risk in preliminary bivariate analyses, but exhibited neither a theoretically sensible direction for its predictive effect nor had a significant association with drug risk in multivariate analyses. Sexual abuse was not significant in either bivariate or multivariate analyses. Although these findings are contrary to much of the literature, they are consistent with findings from one of our earlier studies predicting drug use among a similar population (Klein, Elifson, & Sterk, 2003).

the distributions of the two income variables (income from legal employment and illegal income) were highly skewed, prior to conducting multivariate analyses, we transformed these variables using the natural log of 1 + the reported income. To address a minimal amount of missing data (1.1%), we used a multiple imputation procedure in PRELIS (Joreskog & Sorbom, 2003).⁶

FINDINGS

Table 1 shows the descriptive statistics for the study sample. The sample was primarily non-white (84%) and slightly less than half (49%) were male. The mean age of respondents was 22.51 (range = 18-46, SD = 4.05). The mean for educational attainment was 11.18 (range = 5-15, SD = 1.70). Most respondents (81%) were not married or cohabiting, and almost one-half (48%) had at least one child. The mean previous 90-day income from legal employment for the sample was \$2,871 (range = 0-\$33,600, SD = 3,922). Reported mean income from illegal sources for the same time period was \$1,003 (range = 0-\$3,000, SD = 3,199). Approximately one-third (33 %) of respondents reported having been arrested and charged with a crime in the past year. A large percentage reported drinking alcohol and smoking cigarettes in the past week (66% and 63% respectively).

The correlations presented in Table 1 provide preliminary support for several of the study hypotheses. For example, depression, lack of self-determination, and low self-control were significantly and positively correlated with drug risk, while self-esteem was significantly and negatively associated with drug risk. In addition, all variables in the family-of-origin domain were significantly and positively related to drug risk. Similar patterns were identified for the link between current situational characteristics and drug risk.

Table 2 shows the results of four multivariate regression models predicting what effect the family of origin characteristics variables had on drug risk without the hypothesized social-psychological mediating variables. When the family-of-origin variables were entered individually, while controlling for socio-demographic characteristics and current situational characteristics, maternal drug use (Model 1), parental neglect (Model 2), and emotional abuse (Model 3) emerged as significant predictors of drug risk. In the full model (Model 4), which included all three of the family-of-origin predictors, only emotional abuse maintained significance ($b=0.120$, $p < .001$).

This analysis indicates that emotional abuse has an important effect on drug risk independent of other familial risk factors, such as parental drug use and parental neglect. Due to the moderately strong bivariate association between parental neglect and parental drug use ($r = .44$) in the preliminary analyses and some evidence in the literature that parental drug use may be a precursor to other forms of abuse, we investigated this relationship. However, this analysis did not indicate a mediating effect (not shown). Relative to other variables in the final model (Model 4), the standardized coefficients (not shown) revealed that emotional abuse ($\beta = .403$) was more important in predicting drug risk than three of the more proximal current situational factors, which were hypothesized to be stronger predictors of drug risk: smoking cigarettes in the last 7 days ($\beta = .340$), having deviant peers ($\beta = .398$), and recent criminal justice involvement ($\beta = .282$), and alcohol use in the past 7 days ($\beta = .465$).

⁶This multiple imputation method employs an estimation-maximization (EM) algorithm and is more efficient than traditional methods, such as listwise deletion (the default in STATA) or mean-substitution, in that it provides more accurate standard error and test statistics, and performs well with small sample sizes (Allison, 2002; Tomarken & Waller, 2005). A parallel analysis that including missing values showed nearly identical results to those reported here.

The regression models presented in Table 3 investigated what influence each of the social-psychological predictors had on drug risk and the extent to which the effect of emotional abuse (the only family-of-origin characteristic found significant in the final model in Table 2) was explained by these variables. We entered the hypothesized mediators individually (Models 2-5) and collectively (Model 6), adjusting for socio-demographic characteristics and current situational characteristics. Model 1 served as a baseline model for assessing the effect of the hypothesized mediators. As these variables were added to the models, any reduction in the effect of emotional abuse was deemed evidence of a mediating effect.

When entered individually, two of the four hypothesized mediators, self-esteem (Model 2) and depression (Model 3), were significant predictors of drug risk. The addition of self-esteem in Model 2 reduced the effect of emotional abuse by about 30% (to $b=.092$, $p < .01$), compared with the baseline effect. Similarly, when depression was added in Model 3, the effect of emotional abuse was reduced about 27% (to $b=.097$, $p < .01$), compared with the baseline effect. The inclusion of the other two hypothesized mediators (lack of self-determination and low self-control or sensation seeking) in Models 3 and 4 did not result in substantial reductions in the effect of emotional abuse, indicating little evidence of mediation. In Model 6, which included all four of the hypothesized mediators, the effects of self-esteem and depression remained fairly constant, indicating that these variables were, for the most part, independently related to drug risk. In addition, these results showed that self esteem and depression each uniquely mediated the relationship between emotional abuse and self esteem.

In separate analyses (not shown), we regressed self-esteem and depression (the only two hypothesized mediators that met our criteria for mediation in the analysis described above) on emotional abuse, holding socio-demographic and current situational characteristics constant. Findings from this analysis showed that emotional abuse was predictive of self-esteem ($b = -.562$, $p < .001$) and depression ($b = .506$, $p < .001$). The final criterion we used to establish mediation was the Sobel test (Sobel, 1982), which showed that the reduction in the effect of emotional abuse on drug risk due to low self-esteem was statistically significant ($z = 4.11$, $p < .001$) and so too was the reduction due to depression ($z = 2.85$, $p < .01$).

Relative to other variables in the final model, the standardized coefficients (not shown in the table) indicate that the strongest predictor of drug risk was revenue from illegal activities in the past 90 days ($\beta = .861$, $p < .001$), followed by alcohol use in the past 7 days ($\beta = .492$, $p < .001$) and personal involvement in criminal activities not directly related to drug use in the past year ($\beta = .452$, $p < .001$). Other significant predictors of drug risk in order of importance, included association with deviant peers ($\beta = .348$, $p < .01$), self-esteem ($\beta = -.346$, $p < .01$), depression ($\beta = .289$, $p < .01$), and smoking cigarettes in the past 7 days ($\beta = .286$, $p < .01$). Although mediation analysis showed that self-esteem and psychological distress accounted for much of the influence of emotional abuse on drug risk, after controlling for these effects, emotional abuse maintained a significant effect on drug risk above and beyond that explained by the mediators ($\beta = .250$, $p < .05$). As shown in Table 3, none of the socio-demographic characteristics were significant predictors of drug risk.

As indicated in Table 3 (Model 6), collectively the variables retained in the final model accounted for 60% of the variation in drug risk. In separate analysis (not shown), we used hierarchical regression analysis to test to what extent variance in drug risk was explained by emotional abuse and the two significant mediators (self esteem and depression) above and beyond the proximal current situational characteristics. The variables were entered in the following order: socio-demographic characteristics, current situational characteristics, emotional abuse, and the two significant mediators, self-esteem and psychological distress. Socio-demographic characteristics explained 13 % of the explained variance. As expected,

current situational characteristics explained the most variance (41%) in drug risk. Adding emotional abuse into the equation resulted in a significant change of 3% of explained variance. Finally, the two mediators explained another 3% of the variance in drug risk beyond that explained by the other predictors in the model. Although the amount of variance explained by the family-of-origin predictors and their respective mediators is relatively small, overall, these findings suggest that these variables play a statistically important role in predicting drug risk. In separate analyses, none of the socio-demographic characteristics were shown to have a moderating effect.

DISCUSSION

Consistent with our first hypothesis and with findings from previous research (see for example, Brook et al., 2006) findings from this cross sectional study show that, overall, current situational/lifestyle characteristics, factors that are more proximal to drug use, have the strongest influence on drug risk. Within this domain, revenue generated from illegal activities was most significant, followed by alcohol use and involvement in non-drug-related crime. The link between illegal income and crime with drug use has been identified in other studies (Sherman & Latkin, 2002; DeBeck et al., 2007; Essien *et al.*, 2004). As noted by others, these findings indicate that drug use and illegal income-generating activities may be mutually reinforcing (Osgood, Wilson, Bachman, O'Malley & Johnston, 1996). Building on the strain, differential association, and social control perspectives, the link between illegal income and drug risk also may be due to the lack of social opportunities for those with low levels of educational attainment and the higher economic profits that may be gained through illegal activities (DeBeck et al., 2007; Edin & Lein, 1997; Fine & Weis, 1998; Newman, 1999). We also note that such activities place individuals at considerable risk for a number of negative consequences, including imprisonment, violent victimization, and other significant health risks (DeBeck et al., 2007; Essien et al., 2004).

As predicted by our second hypothesis, our findings show that family-of-origin characteristics contribute to drug risk at a significant level above and beyond that of the more proximal situational predictors. When assessed individually, parental neglect and parental drug use each had a significant effect on drug risk, but these effects were reduced to non-significance when included jointly as predictors with emotional abuse. Our finding that neither parental neglect nor parental drug use predicted drug risk, after controlling for other familial factors, indicates that these forms of childhood maltreatment may have less of a long-term impact on adult health risk behaviors, compared with emotional abuse.

Although several studies have shown a connection between drug use and childhood maltreatment (see for example, Barret & Turner, 2006; Stein et al., 2002), much of this research is primarily based on adolescent populations. Moreover, few studies have empirically examined the mechanisms through which abuse might influence drug use. In addition to identifying a significant link between emotional abuse and adult drug risk, this study identifies two important mediating processes, low self-esteem and psychological distress, which partially explain this relationship and provides support for our third hypotheses. Our findings that low self control (or sensation-seeking) and lack of self determination neither had a significant effect on drug risk nor mediated the relationship between emotional abuse and drug risk suggest that these variables may have less influence on adult drug use than shown in previous studies that have focused on adolescent drug use. These findings stress the importance of considering emotional abuse in the family-of-origin, especially its long-term effects, when designing drug prevention and intervention programs. As part of these efforts, depression and self-esteem also much be addressed. It appears that individuals who were emotionally abused may suffer more adverse long-term negative consequences than may have been previously assumed.

Although gender was positively correlated with drug risk in bivariate analysis, indicating that males scored higher on drug risk, compared with females, gender was not a significant predictor of drug risk in multivariate analyses nor did it moderate the relationship between drug risk and either of the significant social-psychological mediators. This suggests that these variables, similar to parental neglect and drug use, may have less influence on adult drug risk than shown in previous research among adolescents. None of the socio-demographic attributes remained statistically significant after accounting for the influence of other predictors, a finding that is contrary to much of the literature. Recent research shows that the mechanisms underlying the associations between socio-demographic attributes and drug risk are complex and that caution is needed when interpreting cross-sectional findings such as these, indicating a need for more longitudinal research to disentangle the specific nature of these effects, including the potential moderating effects of other risk factors (Swendsen et al., 2009).

Despite important findings, a few additional limitations of this study should be acknowledged. The data were based on self-reports and some under- or over-reporting may have occurred as well as recall bias. However the time frames were chosen to incorporate a sufficient amount of time to facilitate meaningful variability from person to person and to minimize recall bias. Finally, we note that regional bias or cultural differences could affect the generalizability of the data. Given the community-based nature of the study population, the use of a random sampling strategy is difficult, if not impossible. Large parts of the study area are known for high levels of drug use and/or distribution and characterized by low levels of social capital, including high crime rates and high levels of social disorder and chaos. The residents living in these areas were socioeconomically disadvantaged and tended to belong to racial/ethnic minority groups as is reflected in the racial composition of the study sample as well as the relatively low income levels. If other opportunities for survival and upward social mobility were available, it is likely that drug risk would decrease. Intervention studies examining the impact of providing such opportunities in disadvantaged communities have shown that drug risk, as well as other related health risks, tends to decrease (Sterk, Elifson & Theall, 2007). Overall, the findings suggest that programs and policies focused on a reduction in drug risk will require attention to proximal (e.g., current situational circumstances) and more distal (e.g., family-of-origin characteristics) factors. This will require a multilevel orientation that considers the individual, the family, peers and partners, and the larger social context.

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TABLE 1
DESCRIPTIVE STATISTICS AND CORRELATIONS FOR THE STUDY VARIABLES (N= 242)

	Mean	SD	Drug Risk
Socio-demographic Characteristics			
Age	22.51	4.05	.58
Race (non-white)	.84	.36	.42
Gender (male)	.49	.50	.23 ***
Education (years)	11.18	1.69	-.25 ***
Income from legal employment, past 90 days	2870.70	3922.64	.11
Relationship status (cohabitating)	.19	.39	-.09
Children (at least one)	.48	.50	.01
Current Situational/Lifestyle Characteristics			
Tobacco use, past 7 days	.63	.48	.35 ***
Alcohol use, past 7 days	.66	.47	.28 ***
Association with deviant peers, past year	5.81	4.34	.47 ***
Involvement in non-drug related crime, past year	2.24	2.24	.47 ***
Criminal justice involvement, past year	.33	.47	.34 ***
Revenue from illegal activities, past 90 days	1003.15	3198.55	.55 ***
Family of Origin Characteristics			
Maternal drug use	.48	.50	.19 **
Parental neglect	3.43	3.48	.29 ***
Emotional abuse	3.65	3.36	.27 ***
Social-Psychological Characteristics (mediators)			
Self-esteem	39.46	5.91	-.40 ***
Depression	5.89	5.63	.28 ***
Lack of self-determination	38.59	6.09	.25 ***
Low self-control/sensation-seeking	28.52	5.64	.23 ***
Drug Risk	3.59	2.49	—

Note. Figures reported for income (legal and illegal) reflect non-transformed data.

*p < .05

**
p < .01

***
p < .001

TABLE 2

REGRESSION MODELS PREDICTING DRUG RISK WITH FAMILY CHARACTERISTICS AND
SELECTED INDEPENDENT VARIABLES (N=242)

	Model 1	Model 2	Model 3	Model 4
Family of Origin Characteristics				
Maternal drug use	.491 [*] (.249)			.343 (.276)
Parental neglect		.087 [*] (.037)		.019 (.045)
Emotional abuse			.133 ^{***} (.033)	.120 ^{***} (.036)
Sociodemographic Characteristics				
Age	.012 (.029)	.007 (.031)	.004 (.028)	.002 (.029)
Race (non-white)	-.659 [†] (.382)	-.535 (.382)	-.283 (.381)	-.441 (.393)
Gender (male)	.025 (.252)	-.059 (.251)	.028 (.249)	.099 (.254)
Education (years)	-.087 (.080)	-.069 (.082)	-.104 (.079)	-.092 (.081)
Income from legal employment, past 90 days	-.125 [†] (.073)	-.133 [†] (.071)	-.097 (.066)	-.103 (.066)
Relationship status (cohabitating)	-.456 (.287)	-.364 (.279)	-.384 (.267)	-.380 (.271)
Children (at least one)	.125 (.247)	.105 (.255)	.129 (.250)	.111 (.252)
Current Situational/Lifestyle Characteristics				
Tobacco use, past 7 days	.654 ^{**} (.264)	.661 ^{**} (.254)	.717 ^{**} (.251)	.705 ^{**} (.254)
Alcohol use, past 7 days	.905 ^{***} (.248)	1.03 ^{***} (.243)	.966 ^{***} (.238)	.981 ^{***} (.247)
Association with deviant peers, past year	.102 ^{**} (.031)	.092 ^{**} (.031)	.091 ^{**} (.029)	.092 ^{**} (.030)
Involvement in non-drug related crime, past year	.253 ^{***}	.234 ^{***}	.218 ^{***}	.209 ^{***}
Criminal justice involvement, past year	.709 ^{**} (.279)	.707 ^{**} (.282)	.612 [*] (.281)	.599 [*] (.279)
Revenue from illegal activities, past 90 days	.241 ^{***} (.044)	.247 ^{***} (.043)	.251 ^{***} (.043)	.243 ^{***} (.043)
R ^{2a}	.55	.55	.57	.57

Note: Robust standard errors in parentheses

^aWhen using STATA's cluster subcommand, adjusted R² no longer has a clear interpretation (i.e., will no longer reflect the variation of the variables correctly) and, therefore, is not reported in this table or in Table 3.

[†]
p < .10

^{*}
p < .05

^{**}
p < .01

^{***}
p < .001

TABLE 3

REGRESSION MODELS PREDICTING DRUG RISK WITH EMOTIONAL ABUSE, MEDIATING VARIABLES, AND SELECTED INDEPENDENT VARIABLES (N=242)

	Model 1	Model 2	Model 3
Family of Origin Characteristics			
Emotional abuse	.133 *** (.033)	.092 ** (.037)	.097 ** (.035)
Social-Psychological Characteristics (Mediating variables)			
Self-esteem		-.074 **	
Depression			.070 **
Lack of self-determination			
Low self control/sensation-seeking			
Sociodemographic Characteristics			
Age	.004 (.028)	-.006 (.026)	-.018 (.026)
Race (non-white)	-.283 (.381)	-.144 .382	-.212 (.369)
Gender (male)	.028 (.249)	.042 (.242)	.211 (.255)
Education (years)	-.104 (.079)	-.039 (.078)	-.081 (.073)
Income from legal employment, past 90 days	-.096 (.066)	-.076 (.072)	-.081 (.064)
Relationship status (cohabitating)	-.384 (.267)	-.184 (.269)	-.253 (.266)
Children (at least one)	.129 (.250)	.144 (.251)	.078 (.260)
Current Situational/Lifestyle Characteristics			
Tobacco use, past 7 days	.717 ** (.251)	.611 ** (.245)	.661 ** (.243)
Alcohol use, past 7 days	.966 *** (.238)	.973 *** (.232)	1.06 *** (.232)
Association with deviant peers, past year	.091 ** (.029)	.081 ** (.029)	.089 ** (.029)
Involvement in non-drug related crime, past year	.218 *** (.062)	.213 *** (.061)	.198 *** (.060)
Criminal justice involvement, past year	.612 * (.281)	.555 * (.279)	.512 † (.276)
Revenue from illegal activities, past 90 days	.251 *** (.043)	.248 *** (.041)	.247 *** (.042)
R ²	.59	.59	.59
Family of Origin Characteristics			
Emotional abuse	.131 *** (.023)	.129 *** (.035)	.075 * (.039)
Social-Psychological Characteristics (Mediating variables)			
Self-esteem			-.059 ** (.024)
Depression			.051 ** (.021)
Lack of self-determination	.008 (.023)		-.008 (.023)
Low self control/sensation-seeking		.015 (.023)	.006 (.023)
Sociodemographic Characteristics			
Age	.003 (.028)	.004 (.028)	-.019 (.025)
Race (non-white)	-.310 (.378)	-.266 (.385)	-.087 .380

	Model 1	Model 2	Model 3
Gender (male)	.036 (.252)	.030 (.249)	.166 (.249)
Education (years)	-.096 (.086)	-.099 (.079)	-.042 (.078)
Income from legal employment, past 90 days	-.094 (.068)	-.094 (.249)	-.070 (.072)
Relationship status (cohabitating)	-.370 (.268)	-.403 (.269)	-.150 (.269)
Children (at least one)	.126 (.251)	.146 (.252)	.113 (.260)
Current Situational/Lifestyle Characteristics			
Tobacco use, past 7 days	.709 ** (.251)	.698 ** (.252)	.592 ** (.244)
Alcohol use, past 7 days	.967 *** (.239)	.951 *** (.239)	1.04 *** (.233)
Association with deviant peers, past year	.091 ** (.029)	.087 ** (.030)	.080 ** (.029)
Involvement in non-drug related crime, past year	.217 *** (.062)	.220 *** (.062)	.207 *** (.061)
Criminal justice involvement, past year	.608 * (.282)	.596 * (.282)	.492 [†] (.276)
Revenue from illegal activities, past 90 days	.249 *** (.043)	.251 *** (.042)	.247 *** (.042)
R ²	.57	.57	.60

Note: Robust standard errors in parentheses

[†]
p < .10

*
p < .05

**
p < .01

***
p < .001