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The Association of Self-Reported Neighborhood Disorganization and Social Capital with Adolescent Alcohol and Drug Use, Dependence, and Access to Treatment

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Abstract

Aims—This research examines adolescent perceptions of neighborhood disorganization and social capital to determine if they are associated with adolescent alcohol or drug (AOD) use, AOD dependence, and access to AOD treatment.

Design—This is a secondary analysis of data from the 1999 and 2000 National Survey on Drug Use and Health (NSDUH). The NSDUH is a cross-sectional survey of a random sample of the non-institutionalized United States population and is conducted in respondents' homes.

Participants—Youth between the ages of 12 and 17, yielding a sample size of 38,115 respondents.

Measurements—Neighborhood disorganization was self-reported by youth in response to eight items; ten items measured social capital. AOD use was also self-reported. AOD dependence was assessed by a series of questions regarding symptoms and impairment that is consistent with the criteria specified in the DSM-IV.

Results—A little more than half of the youth reported never using alcohol or drugs (54.3%), 41.1% reported lifetime AOD use, and 4.6% were AOD dependent. Two percent reported receiving AOD treatment. Medium and high levels of social capital were negatively associated with AOD use and

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dependence. Social capital was unrelated to access to AOD treatment. Neighborhood disorganization was positively associated with AOD use, dependence, and access to treatment.

Conclusions—After controlling for individual- and family- level characteristics, neighborhood disorganization and social capital were associated with AOD use and dependence. The findings suggest that subjective measures of social context may be an important component of the complex biopsychosocial model of adolescent AOD addiction and treatment utilization.

Keywords

Adolescents; Substance-Related Disorders; Mental Health; Community Psychiatry; Social Capital; Neighborhood Disorganization

1. Introduction

Many adolescents will experiment with alcohol or drug (AOD) use before graduating high school. According to the 2005 Monitoring the Future Survey, 75% of high school seniors have tried alcohol and 50% have tried an illicit drug (Johnston et al., 2005). Adolescent AOD use is associated with negative consequences including criminal, health, and social problems (Hawkins et al., 1992; Brook et al., 2002; Green and Ensminger, 2006; Newcomb & Bentley, 1988). The negative consequences of adolescent AOD use may escalate as the teen transitions into adulthood. Early onset of AOD use is associated with a significant increased risk of later abuse or dependence (Schneider Institute for Health Policy, 2001), and late adolescence has been identified as a particularly high risk period for developing drug dependence (Anthony and Helzer, 2002). Consequently, theories and models of adolescent AOD use have focused on the initiation of AOD use and the transitions between the use of drugs with low dependence liability to drugs with a higher dependence liability (Kandel, 2002). More than 70 factors have been identified for adolescent AOD use (Swadi, 1999) and the majority of these fit into the categories of individual-, family- or peer-levels. A comprehensive review of adolescent risk factors (Hawkins et al., 1992; Swadi, 1999) and social-level factors for adults has been presented elsewhere (Galea et al., 2004). Within the field of public health, there has been a renewed interest in exploring the impact of environment- or community-level factors on various health conditions and research in this area has used census-based measurement of community effects, and census tracts may or may not reflect neighborhoods. This study will focus on two community factors, neighborhood disorganization and social integration, which in adult samples have been associated with AOD use and there has been a limited amount of research looking at this association in adolescent samples.

1.1. Neighborhood Disorganization

Sampson and Groves (1989) have defined social disorganization as the “inability of a community structure to realize the common values of its residents and maintain effective social control” (Sampson and Groves, 1989, p.777) and defined as such it is referred to as neighborhood disorganization. There is no gold standard for the measurement of neighborhood disorganization and the measures of neighborhood disorganization are at times inconsistent. In the work of Crum and colleagues' (1996) measures of neighborhood disorganization included subjects' perceptions of areas to walk or play, safety outdoors, crime, racism or prejudice, litter, vandalism, publicly visible alcohol or drug use, abandoned buildings, poverty, church attendance, and sense of community. Other neighborhood characteristics that are indicators of neighborhood disorganization include: teenagers loitering, homeless persons, burglary, drug selling, robbery, and prostitution (Latkin and Curry, 2003; Hadley-Ives et al., 2000). Ennett and colleagues (1997) also included population density and high residential mobility, which are thought to erode social control and social integration within neighborhoods.

A community disorganization framework has been applied to studies of adolescent drug use. Studies of neighborhood characteristics and AOD use/dependence among adolescents have used several measures of neighborhood, with varying results. Using a perceived measure of neighborhood disorder, Jang and Johnson (2001) found that neighborhood disorder was associated with adolescent drug use, independent of social bonding and social learning. In an adolescent sample, Hadley-Ives and colleagues (2000) found that youth reported neighborhood characteristics, such as abandoned buildings and crime, were associated with AOD problems and mental health. Additionally, Duncan and colleagues (2002) using a multilevel model found results that support a community disorganization framework and in a study based in Oregon, lower social cohesion (as reported by neighborhood residents) was associated with higher rates of adolescent drug- and alcohol-related arrests. A contrary finding was reported by Ennett and colleagues (1997) who used a measure of neighborhood disorganization based on both parents' reports of neighborhoods and census tract information. Ennett and colleagues (1997) found that lifetime rates of both alcohol and cigarette use were higher in neighborhoods with greater social advantages. So while there have been a number of studies that have examined adolescent drug use from a community disorganization framework, measures have varied as have the results.

1.2 Social Capital

The link between health conditions and social integration has been firmly established (House et al., 1988). Social capital is one indicator of social integration and at the collective level it refers to the “features of social organizations, such as networks, norms, and trust that facilitate action and cooperation for mutual benefit” (Putnam, 2000, pp. 35-36). Much of the research on social capital and health in the past decade has used Putnam's definition of social capital as civic participation, which frequently occurs through involvement in community organizations or voluntary associations (Putnam, 1995). Weitzman and colleagues (1999) found that social capital, as measured by volunteerism, was associated with decreased rates of binge drinking and alcohol abuse among college students. A Swedish study found a weak association between individual-level social capital and cigarette use (Lindstrom et al., 2003). While social capital and AOD use have not been extensively studied in adult or adolescent samples, other indicators of social integration have been. Specifically, peer affiliation and social bonding have been associated with adolescent drug use (Hawkins et al., 1992; Ensminger et al., 2002). Low social bonding has been associated with early onset of drug use (Ellickson et al., 2001) and low social bonding in adolescence was found to predict adult drug use among females in a longitudinal study (Ensminger et al., 2002).

1.3 Adolescent Factors Associated with Access to Treatment

Given the pervasiveness of AOD use in adolescents, understanding the potential differences in factors associated with AOD use versus dependence are important to the design of targeted primary and secondary interventions. This distinction is particularly important given the significant unmet need for adolescent AOD treatment. Using a nationally representative sample, the National Survey on Drug Use and Health (NSDUH) 2000 found that only 11.4% of 12- to 17-year-olds who needed treatment for illicit drug addiction received treatment (Epstein, 2002). Adolescent AOD treatment research usually recruits samples from treatment facilities. Therefore, participants include only the treatment-seeking population, which represents only one out of ten adolescents who need treatment. Adolescent AOD treatment can be efficacious and effective (McLellan et al., 2000; Morral et al., 2004); however, the low rate of treatment utilization limits the potential benefits.

Few studies have identified factors associated with adolescent access to AOD treatment, and barely a handful of community indicators have been investigated. Aday and Andersen's emerging model of access to care (Andersen, 1995) has been extended to AOD treatment

(Stiffman et al., 2000; Wu et al., 2001; Wu et al., 2002). Wu and colleagues (2003) focused on predisposing and need factors associated with adolescent access and found that age, gender, co-occurring mental health problems, and severity of drug problems were associated with access to drug treatment. The only community factor Wu and colleagues (2003) included was living in an urban area, which was unrelated to access to substance abuse treatment in the multivariable model.

The purpose of this study is to examine the influence of self-reported neighborhood disorganization and social capital as community factors for adolescent AOD use, dependence and access to treatment. While there is existing research to support an association between neighborhood disorganization and social capital and AOD use/addiction, the empirical evidence yields mixed results and few of these studies have utilized adolescent samples nor relied on subjective measures of the social context.

Based on the existing literature, it is hypothesized that higher levels of neighborhood disorganization and lower levels of social capital are associated with AOD use and dependence. In respect to access to treatment, we hypothesize that youth reporting high rates of neighborhood disorganization would be less likely to access AOD treatment and that youth with high social capital would be more likely to access AOD treatment. While there is limited literature on which to base our hypotheses regarding access to AOD treatment, neighborhoods that are disorganized may lack adequate local resources, and it seems logical that AOD treatment facilities may be one of the resources lacking. In respect to social capital, social integration has been hypothesized to have a positive influence on physical and mental health in part because of the provision of health information through social ties. This is the first study to examine the association of neighborhood disorganization and social capital with adolescent AOD use, AOD dependence, and receipt of AOD treatment using a nationally representative sample.

2. Methods

This is a secondary data analysis of the 1999 and 2000 National Survey on Drug Use and Health (NSDUH). The NSDUH, funded by the Substance Abuse and Mental Health Services Administration, has been conducted annually since 1971, and it is a publicly available dataset. The NSDUH uses a multi-stage sampling design to achieve a probability sample of the non-institutionalized civilian population and is estimated to represent 98% of the United States population. The NSDUH is *not* generalizable to children under the age of 12 years; active military personnel; non-English or Spanish speakers, or those living in institutional settings of care such as a correctional facility, medical hospital, or an inpatient mental health facility. The weighted screening response rate was 90% in 1999 and 93% in 2000. The weighted interview response rate was 69% in 1999 and 74% in 2000 (U.S. Department of Health and Human Services, 2002; U.S. Department of Health and Human Services, 2001). In this study we focus on those in the sample between the ages of 12 and 17. The 1999 and 2000 versions of the public release data sets were combined and resulted in a sample size of 38,115 youth respondents. Five hundred and three of these interviews were conducted in Spanish. The Committee on Human Subjects at Johns Hopkins Bloomberg School of Public Health approved this research.

2.1. Measurements

2.1.1 Dependent Variables—The two dependent variables are 1) AOD use, including AOD dependence and 2) receipt of AOD treatment. The first dependent variable, AOD use, is categorized as: never used AODs, used AODs, and AOD dependent. AOD use included licit and illicit drug use, including the misuse of prescription drugs. Tobacco use and dependence was excluded from this analysis because of differences in treatment protocols for tobacco versus AOD dependence. Never used versus used AODs was based on participants' lifetime

use self-reports. Youth self-reports of AOD use demonstrate reliability, particular when confidentiality is assured by the computer-assisted interview method (Ensminger et al., 1997; Gfroerer, 1985; Gfroerer et al., 2002). The NSDUH utilizes a series of questions regarding symptoms and impairment that are consistent with the criteria specified in the DSM-IV, and researchers have created an algorithm that identifies probable AOD dependence diagnostic categories (Kandel et al., 2001). Variables are available indicating lifetime AOD abuse and dependence in the 2000 dataset, but only for AOD dependence in the 1999 dataset. Because the 1999 and 2000 datasets were combined, the lifetime dependence category does not include abuse, which was combined with the AOD use group.

The second dependent variable is AOD treatment. All of the treatment variables were preceded by the stem question: “have you received treatment or counseling for your use of alcohol or any drug, not counting cigarettes?”. The following items begin with “have you received treatment for your X” (where X refers to the use of or dependence on a specific drug) and include the following settings of care: “in a hospital overnight as an inpatient?”, “in a residential drug or alcohol rehabilitation facility where you stayed overnight?”, “in a drug or alcohol rehabilitation facility as an outpatient?”, “in a mental health center or facility as an outpatient?”, “in an emergency room?”, “in a private doctor’s office?”, “in a prison or jail?”, “in a self-help group such as Alcoholics Anonymous or Narcotics Anonymous?”, and “in some other place besides these that have been listed?” A summary variable was created to indicate no treatment versus receipt of any AOD treatment.

2.1.2 Covariates—The covariates are grouped into categories, which were then used to build the multivariable models. The categories were individual- and family- level characteristics. The individual characteristics include age, gender, race/ethnicity, and school performance (A, B grades versus C, D, F grades). In the public release data set, age is only available as an ordinal level variable with the following categories: 12-13 years old, 14-15 years old, and 16-17 years old. Race and ethnicity were combined into White, Black, Hispanic, and Other. “Other” includes Native Hawaiian and Pacific Islander, Asian, Native American, and more than one race. The family-level characteristics included family income, poverty, health insurance, and household composition. Family income was an ordinal level variable used only in the descriptive statistics. The poverty status variable was created using the DHHS 1999 and 2000 Poverty Guidelines whereby poverty level is determined by a combination of family income and the number of persons in the household (U.S. Department of Health and Human Services). However, the public-release NSDUH dataset does not include family income as a continuous variable; therefore, categories of income were used to approximate poverty status. Health insurance was categorized as a family-level variable because adolescents are usually covered by their parents’ health insurance. Health insurance combined several variables to create these categories: no health insurance, public health insurance (Medicaid and Medicare), and private health insurance (including military or federal health insurance). Household composition collapsed multiple variables into a summary of neither mother nor father in the household, father only, mother only, and both mother and father in the household.

2.1.3 Neighborhood Disorganization Measurement—There were eight items that indicated neighborhood disorganization which were combined to create a composite measure of neighborhood disorganization. These items used a four point likert scale from strongly agreed to strongly disagreed with the following statements regarding the neighborhood in which the respondent currently lived: 1) “There is a lot of crime in your neighborhood.”, 2) “A lot of drug selling goes on in your neighborhood.”, 3) “People in your neighborhood often help each other out.”, 4) “There are lots of street fights in your neighborhood.”, 5) “There are many empty or abandoned buildings in your neighborhood.”, 6) “People in your neighborhood often visit in each other’s homes.”, 7) “There is a lot of graffiti in your neighborhood.” and 8) “People move in and out of your neighborhood often.” The responses were recoded as agreed

versus disagreed for the descriptive statistics (see Table 1) and then summed to generate a single variable (range 0-8). This summary variable was divided into low (0), medium (1), and high categories (2-8) based on tertiles for the multivariable analyses. Exploratory factor analysis was used to confirm a one-dimensional scale based on the eigenvalues (>1) in a principal components analysis and the scree-plot (Kim and Mueller, 1978). The scale demonstrated good internal consistency (Cronbach's $\alpha = 0.73$).

2.1.4 Social Capital Measurement—The social capital questions ask if “During the past 12 months have you participated in” the following activities: 1) “a Big Brother/Big Sister/Big Buddy program or peer mentoring or tutoring program.”, 2) “center activities, at the YMCA, YWCA, or other similar community centers.”, 3) “Boy Scouts or Girl Scouts.”, 4) “team sports such as football, basketball, swimming, or gymnastics.”, 5) “a 4-H Club.”, 6) “a school band, orchestra, or choir.”, 7) “school-related clubs.”, 8) “volunteer or community work, such as recycling or clean-up projects.”, 9) “student government.”, and 10) “church choir.” These variables were combined in order to capture the degree of civic participation (range 0-10). This summary variable was divided based on tertiles into low (0-1), medium (2-3), and high (4-10) categories for the multivariable analyses.

2.2 Missing Values

The public release version of the NSDUH includes variables with imputed values for the majority of the demographic characteristics using unweighted hot deck imputation (U.S. Department of Health and Human Services, 2001; U.S. Department of Health and Human Services, 2002). For the other variables included in this analysis that were not already imputed, the IMPUTE command in Stata was used to generate missing values. If any of the variables were systematically missing a covariate, then these covariates were entered into the imputation regression equation in order to minimize bias. In respect to the dependent variables, no respondents were missing data for AOD use.

2.3 Analysis

Stata SE Version 8 was used to conduct all of the analyses. Descriptive statistics are presented followed by the multivariable models for both outcome variables. The OMODEL (chi-square=80.3, $p<0.01$) and BRANT (chi-square=79.6, $p<0.00$) commands in Stata indicated that the proportional odds assumption would be violated if the first outcome variable was considered ordered (no lifetime AOD use, lifetime AOD use and AOD dependence) and therefore multinomial logistic regression was utilized. The second outcome variable was assessed via logistic regression because AOD treatment was a dichotomous variable (no/yes). For both outcome variables, the multivariable analyses were adjusted for the complex sampling design [robust cluster (verep)]. The multivariable model begins with the individual-level variables, adds the family-level variables, and finally adds neighborhood disorganization and social capital variables. The multivariable model for AOD treatment controlled for AOD use and dependence since these factors have already been demonstrated as important determinants of entering treatment.

3. Results

3.1.1 Demographic Characteristics

The sample was relatively evenly balanced in terms of gender and age. There were slightly more males (50.6%) than females (49.4%), and approximately one-third of the sample was in each age category. Sixty-seven percent of the sample was White, 13.5% was Black, 13.7% was Hispanic, and 5.9% was in the “other” racial category. Most youth reported either A or B grades (78%). Six percent ($n=2,253$) reported a family income of \$10,000 or less and 20.8% ($n=7,937$) reported a family income of \$75,000 or more. The majority (70.9%) of youth were living with

both parents, 20.9% were living with only their mother, 4.0% were living only with their father, and 4.2% were living with neither parent. Most youth (77.2%) had private health insurance, 12.3% had public health insurance, and 10.5% reported no health insurance.

A little more than half of the youth reported never using AODs (54.3%), 41.1% reported lifetime AOD use, and 4.6% meet the criteria for AOD dependence. Among those who reported lifetime AOD use, 48.2% (n=8,403) reported trying only alcohol and 23.5% (n=4,099) reported trying only alcohol or marijuana. The frequencies for the neighborhood disorganization and the social capital items are displayed in Table 1. The three neighborhood disorganization items that were most frequently endorsed were people move in and out (29.7%), people don't visit each other (26.2%), and drug selling (25.1%). The mean neighborhood disorganization score was 1.7 (SD=1.7, IQR=2.0), where 0 equals no disorganization and 8 equals extreme disorganization. The three most frequently endorsed social capital items were team sports (62.4%), school clubs (48.3%), and volunteer work (36.6%). The mean social capital score was 2.7 (SD=2.0, IQR=3.0), where 0 equals no civic participation and 10 equals very high civic participation.

Few respondents reported receiving AOD treatment. Eight hundred and thirteen (2.2%) youth reported ever receiving AOD treatment and 609 (1.6%) reported receiving AOD treatment within the past 12 months. The frequencies for the modality of treatment are: 23.5% (n=118) overnight in hospital, 25.8% (n=130) overnight residential rehabilitation center, 34.3% (n=170) outpatient residential rehabilitation center, 25.3% (n=125) mental health center, 15.1% (n=75) emergency room, 17.1% (n=85) private doctor's office, 6.6% (n=33) jail or prison, 47.0% (n=236) self-help group, and 47.2% (n=238) other. Seventeen percent (n=295) of those who were AOD dependent reported ever receiving AOD treatment.

3.2 Multivariable Analyses for AOD Use/Dependence

The results of the analyses are presented in Table 2. In model 3, youth reporting either medium or high levels of social capital had a lower odds of AOD use and dependence compared to youth reporting low levels of social capital. Youth who reported either medium or high levels of neighborhood disorganization had a higher odds of AOD use or dependence compared to youth reporting low levels of neighborhood disorganization. For example, youth who reported high levels of neighborhood disorganization had 2.6 the odds of AOD dependence compared to youth reporting low levels of neighborhood disorganization. Youth who were female, older, had poor grades, or lived with either one or neither parent had a higher odds of AOD use and dependence. For example, youth 16- to 17- years old had a 17.8 odds of AOD dependence compared to youth who were 12- to 13- years old. Youth who were non-White had a lower odds of AOD use or dependence compared to White youth. Youth living in poverty had a lower odds of AOD use (OR=0.78, $p<0.01$), but poverty was not related to AOD dependence. Youth with public health insurance had a slightly higher odds of AOD use (OR=1.03, $p<0.01$) and youth with private health insurance had a lower odds of AOD dependence (OR=0.86, $p<0.01$) compared to youth with no health insurance.

3.3 Multivariable Analysis for AOD Treatment

The results of the multivariable analyses for AOD treatment are displayed in Table 3 and the analysis controlled for AOD use and dependence. Youth reporting high levels of social capital had a lower odds of receiving AOD treatment compared to youth reporting low levels of social capital, however the coefficient was only marginally statistically significant ($p=0.06$). Youth reporting medium and high levels of neighborhood disorganization had a higher odds of receiving treatment compared to youth reporting low levels of neighborhood disorganization. For example, youth reporting high levels of neighborhood disorganization had 1.5 the odds of receiving AOD treatment compared to youth reporting low levels of neighborhood

disorganization. Youth who were older, in the 'Other' racial category, had poor grades, or lived with either only their mother or neither parent had a higher odds of receiving AOD treatment. Youth who were female (OR=0.88, $p<0.01$) or Black (OR=0.53, $p<0.01$) had a lower odds of receiving treatment.

4. Discussion

4.1 AOD Use/Dependence and Neighborhood Disorganization

AOD use and dependence was found to be associated with neighborhood disorganization even after controlling for individual- and family- level characteristics. This finding is consistent with previous research (Hadley-Ives et al., 2000; Jang and Johnson, 2001; Duncan et al., 2002), although these studies used slightly different techniques to measure neighborhood disorganization. The data may suggest a positive linear relationship between AOD involvement and neighborhood disorganization given that the odds increase between the lowest category of neighborhood disorganization compared to the medium and high levels for both AOD use (medium category OR=1.14, high category OR=1.42) and dependence (medium category OR=1.45, high category OR=2.60). An item asking whether the respondent had been approached by someone selling drugs was added to the final multivariable model (data not shown) and the neighborhood disorganization coefficient remained statistically significant. Although this item does not comprehensively measure illegal drug exposure opportunities, it may control for neighborhoods with explicit illegal drug dealing.

4.2 Social Capital

The observed relationship between social capital, AOD use, and AOD dependence was consistent with research using other indicators of social integration in college and adult samples (Weitzman et al., 1999; Lindstrom et al., 2003). Youth reporting higher levels of social capital have a lower odds of both AOD use and dependence. Family connectedness and parental support, which may represent social integration, have been linked to AOD use (Pagliaro and Pagliaro, 1996). Social capital, as it is operationalized in this study, represents one domain of social integration, which Putnam (1995) referred to as civic participation. Many of the social capital items assess participation in school- or community-based organizations that generally offer some adult supervision and may explicitly prohibit drug use. Given the role of peer influence on adolescent AOD use, civic participation may be moderated by the presence of an adult. The NSDUH does not provide information regarding adult supervision of the social capital organizations; therefore, this assumption could not be tested. Social capital may represent what the social development model refers to as prosocial involvement (Hawkins et al., 1992). Social integration outside of the family may be particularly important for youth from dysfunctional families.

4.3 Receipt of AOD Treatment

Social capital was unrelated to AOD treatment access, but youth who report higher levels of neighborhood disorganization had a greater odds of receiving AOD treatment in comparison to youth reporting low levels. Youth reporting medium- and high-levels of neighborhood disorganization are *more* likely to receive services, not *less* likely to receive treatment as we had hypothesized. This may suggest that treatment resources are being appropriately placed, but this may also raise concerns regarding treatment access in more organized neighborhoods. While there was limited empirical evidence on which to base our hypothesis regarding social capital, we had borrowed evidence from research on other health conditions, which suggested that social capital was a potential conduit of positive health information. There are three plausible explanations for the lack of an association between social capital and access to AOD treatment. First, civic participation, as a measure of social capital and social integration, may not be a conduit for health promotion information or it may not be applicable as such to

adolescents. Second, given the stigma associated with AOD dependence and AOD treatment, the provision of health promotion information through civic participation may not relate directly to access to AOD treatment. And third, youth who report belonging to prosocial organizations may be less in need of services. Given the dearth of literature on the association between the social context and access to substance abuse services beyond geographic location, additional research is need to better understand the results observed in this study.

A comparison of the individual- and family- level characteristics associated with AOD use/dependence (see Table 2) and AOD treatment (see Table 3) may illuminate gaps in service provision. Females have a higher odds of AOD dependence, but a lower odds of receiving treatment compared to males. Other studies have documented that females and younger adolescents are less likely to access treatment (Wu et al., 2002). Non-White youth had a lower odds of AOD use or dependence, however Black youth had a lower odds and the 'Other' racial category had a higher odds of receiving treatment. Future research is needed to determine whether the unmet need for services among Black youth partially explains why Black youth are more likely continue AOD use into adulthood (Ensminger et al., 1997) and disproportionately experience the negative consequences of persistent AOD use, including AOD dependence and incarceration. Youth with public health insurance had a higher odds of AOD use and those with private health insurance had a lower odds of AOD dependence. However, health insurance was unrelated to receipt of AOD treatment. Living in poverty was only related to a lower odds of AOD use and was unrelated to either AOD dependence or receipt of treatment. Youth living with neither parent were more likely to use AODs and be AOD dependent than are youth living in any other household configuration. Pagliaro and Pagliaro (1996) documented that the absence of the mother in a household is a risk factor for AOD use, and Cornelius and colleagues (2001) found an association between household composition and adolescent access to mental health treatment.

4.4 AOD Use/Dependence Research Implications

These research findings have implications for future research. The results regarding neighborhood disorganization raise several important measurement issues. One methodological issue taps into a larger debate regarding the level at which community characteristics should be assessed. The majority of research on community indicators uses census data or other data aggregated at the neighborhood-level such as crime statistics. However, the results of this study suggest that individual perceptions of neighborhood characteristics are potentially as important as external or objective measures in AOD use/addiction research. The importance of perceptions of health status have been documented elsewhere. For example, general health status is frequently used in health services research as a subjective measure because it is a better predictor of morbidity and mortality than are physicians' objective reports of general health (Mossey and Shapiro, 1982). Further research is needed to determine the relationship between census-based objective measures and individuals' subjective perceptions of neighborhood disorganization, as well as illuminate how these perceptions may change during the transitions from non-use to use and use to abuse/dependence.

Another measurement issue pertains to variations in how community variables are conceptualized and operationalized which has created confusion and undoubtedly contributed to the difficulty in establishing the creditability of community factors. Hadley-Ives and colleagues (2000) hypothesize that conflicting data on effects of neighborhood characteristics and mental health may reflect measurement issues. The selection argument, drift hypothesis, or economic perspective argue that the observed community effect does not in fact exist independently of individuals, but rather reflects aggregated individual residential preferences. The drift hypothesis proposes that low socio-economic status (SES) does not cause poor health,

but that poor health leads to low SES (Yen and Syme, 1999). Given that the majority of adolescents are not living independently, the drift hypothesis may not be directly relevant to adolescents or it may be distally related as a function of parental drug use. The continued development of standardized measures of community-level variables such as neighborhood disorganization will be essential to advancing this area of research, as well as discriminating individual- versus community- level effects.

Social capital and neighborhood disorganization are interrelated and it is unclear to what extent indicators of these latent constructs are mutually exclusive. For example, mutual trust is an intrinsic component of social capital, and trust among neighbors is frequently included in neighborhood disorganization scales. The correlation between the continuous summary variables for neighborhood disorganization and social capital in this study is weak (Spearman's $\rho = -0.14$, $p < 0.00$). The correlation between the individual items in both scales ranged from a low of 0.00 to a high of 0.11. In this study, the low correlation between neighborhood disorganization and social capital may be a result of the way the constructs were operationalized. Future research is needed to determine which indicators are more consistent with neighborhood disorganization and which are more consistent with social capital.

4.5 Policy Implications

The identification of neighborhood disorganization might be used to target AOD abuse prevention programs as well as urban policy. For example, government funding priorities support AOD prevention programs that operate in federally designated high-intensity drug trafficking areas (HIDTA). Although HIDTA focuses primarily on reducing drug trafficking, the Office of National Drug Control Policy (2004) suggests that the designation also includes areas that experience harmful consequences of drug use. Neighborhood disorganization could be used as an empirical measure to supplement the police records currently used to designate HDTAs. Neighborhood disorganization is associated with a variety of other social problems, most notably crime, and thus may provide an essential tool for urban planning efforts to facilitate healthy neighborhoods and assess the extent to which neighborhoods are factors associated with adolescent AOD use, dependence, and access to treatment.

The findings on social capital may be relevant to AOD programs and policies, particularly since characteristics of communities are more malleable compared to individual-level characteristics. Participating in school and community organizations increases an adolescent's social capital and adolescents can choose organizational affiliations that reflect their areas of interest. The protective role of civic participation might be amplified by ensuring that the adult leaders of community organizations understand the activity's potential role in moderating adolescent AOD use and dependence. Clayton and colleagues (1996) found that drug information and education programs are largely ineffective in preventing AOD use and abuse, and the need for secondary prevention programs has been recognized. AOD prevention messages could easily address the importance of adolescent involvement in civic groups, just as current prevention messages emphasize the importance of parental involvement in their adolescents' lives.

Addressing the unmet need for adolescent AOD treatment is important in order to alter negative trajectories that may extend into adulthood, as well as to address disparities in access to AOD treatment. The concurrent assessment of factors associated with AOD use, dependence, and access treatment highlights these treatment access disparities. In this study, health insurance is unrelated to access to AOD treatment. Wu and colleagues (2002) found that only Medicaid and Medicare health insurance was related to access to adolescent substance abuse treatment; however, Wu and colleagues (2002) used a less stringent definition of need for treatment compared to that used in this study. One of the most frequently employed solutions to improve access to care is the expansion of health insurance coverage, yet this approach alone is unlikely

to be sufficient. Studies conducted in countries with universal health care have documented significant unmet needs for AOD and mental health treatment (Fournier et al., 1997; Glied et al., 1997; Parikh et al., 1999). Strategies need to be developed that address the disjunctions between the need for and access to AOD treatment.

4.6 Limitations

This research used a cross-sectional dataset, which limits conclusions to associations rather than causality. Some other issues also may circumscribe the findings of this research. Neighborhood disorganization and social capital are dynamic variables and may change over time just as adolescent perceptions may change relative to their drug involvement. The assessment of neighborhood disorganization was based on only individual perceptions and could not be geographically aggregated. Although there is some debate regarding the correct level of measurement of community characteristics, it is likely that the gold standard may include multiple levels of measurement and modeling (Subramaniam et al., 2003). Future research will investigate ecometrics (the ecological equivalent of psychometrics) in order to address some of these methodological issues (Raudenbush, 2003). Due to the limitations of the dataset, the categories AOD use and AOD abuse were collapsed and it is uncertain how this may have affected the results and if the results are generalizable outside of the United States. Additionally, this study focused only on access to AOD treatment and did not recognize the gradations inherent in service utilization. In addition to evaluating access to treatment, services research must address issues such as treatment duration and quality of care.

5. Conclusions

In conclusion, neighborhood disorganization and social capital are associated with adolescent AOD use, dependence, and access to treatment. These concepts have the potential to simultaneously address primary and secondary adolescent AOD prevention and may be worth incorporating into community-based interventions provided that future research demonstrates a causal association. The findings suggest that subjective measures of social context may be an important component of the complex biopsychosocial model of adolescent AOD addiction and treatment utilization.

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Table 1
Neighborhood Disorganization and Social Capital Items by AOD Use & Dependence

	Total ^a (n=37,795)	Non-AOD User ^b (n=20,482)	AOD User (n=15,563)	AOD Dependent (n=1,750)
Neighborhood Disorganization (statement agreement^c)				
People moved in/out *	29.7%	29.6%	29.3%	35.3%
Graffiti *	15.2%	14.3%	15.7%	21.7%
People don't visit *	26.2%	24.7%	27.9%	28.5%
Empty buildings *	11.4%	10.6%	11.9%	17.4%
Street fights *	14.1%	12.5%	15.2%	22.9%
Don't help each other *	21.2%	18.4%	23.9%	30.7%
Drug selling *	25.1%	19.2%	30.7%	45.3%
Lot of crime *	21.9%	20.8%	22.4%	30.0%
Social Capital (group participation)				
Church Choir *	19.3%	22.8%	15.3%	13.6%
Student Government *	12.4%	22.8%	15.3%	13.6%
Volunteer Work *	36.6%	37.7%	35.6%	32.8%
School Clubs *	48.3%	48.7%	48.8%	39.4%
School Band *	35.7%	41.6%	29.5%	21.9%
4-H Clubs *	6.8%	7.3%	6.3%	6.2%
Team Sports *	62.4%	64.0%	61.3%	53.0%
Boy/Girl Scouts *	10.6%	12.7%	8.1%	7.3%
Youth Center *	21.7%	24.2%	19.0%	16.5%
Big Brother/Sister *	13.5%	14.7%	12.0%	12.6%

^a 320 study participants were excluded because they were missing 5 or more of the 8 neighborhood disorganization items

^b AOD= Alcohol or/and Drug; The categories Non-AOD user, AOD user, and AOD dependent are mutually exclusive categories based on lifetime self-report data.

^c Reported is the percentage of participants who agreed with the following statements regarding the neighborhood in which they lived at the time the survey was administered.

* p<0.05

Table 2

Multinomial Logistic Regression for AOD Use and Dependence

	Model 1					Model 2					Model 3				
	AOD Use		AOD Dependence			AOD Use		AOD Dependence			AOD Use		AOD Dependence		
	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value
Sex															
Male (ref.)															
Female	0.99	0.99, 0.99	<0.01	1.13	1.10, 1.16	<0.01	0.98	0.97, 0.98	<0.01	1.12	1.11, 1.12	<0.01	1.01	1.01, 1.01	<0.01
Age															
12-13 Years (ref.)															
14-15 Years	3.11	3.09, 3.14	<0.01	5.98	4.00, 8.94	<0.01	3.09	3.09, 3.10	<0.01	6.05	4.01, 9.12	<0.01	3.08	3.04, 3.11	<0.01
16-17 Years	6.72	6.33, 7.13	<0.01	18.15	12.26, 26.87	<0.01	6.71	6.40, 7.04	<0.01	18.22	11.91, 27.88	<0.01	6.65	6.38, 6.93	<0.01
Race/Ethnicity															
White (ref.)															
Black	0.71	0.60, 0.85	<0.01	0.45	0.45, 0.45	<0.01	0.64	0.53, 0.76	<0.01	0.37	0.35, 0.38	<0.01	0.60	0.50, 0.72	<0.01
Hispanic	0.94	0.91, 0.98	<0.01	0.84	0.83, 0.84	<0.01	0.93	0.90, 0.96	<0.01	0.78	0.73, 0.84	<0.01	0.87	0.85, 0.89	<0.01
Other	0.76	0.71, 0.80	<0.01	0.72	0.52, 0.99	0.04	0.74	0.72, 0.77	<0.01	0.68	0.45, 1.00	0.05	0.73	0.70, 0.76	<0.01
Grades															
Good (ref.)															
Poor	1.70	1.63, 1.78	<0.01	3.16	2.83, 3.53	<0.01	1.66	1.58, 1.75	<0.01	3.01	2.66, 3.41	<0.01	1.58	1.52, 1.65	<0.01
Poverty															
No (ref.)															
Yes							0.81	0.73, 0.90	<0.01	0.79	0.55, 1.15	0.22	0.78	0.70, 0.88	<0.01
Health Insurance															
None (ref.)															
Public							1.05	1.03, 1.07	<0.01	1.01	0.70, 1.47	0.95	1.03	1.03, 1.04	<0.01
Private							0.92	0.80, 1.05	0.20	0.78	0.73, 0.84	<0.01	0.96	0.83, 1.11	0.60
Household Composition															
Both Parents (ref.)															
Mom Only							1.44	1.41, 1.47	<0.01	1.77	1.61, 1.93	<0.01	1.41	1.36, 1.46	<0.01
Dad Only							1.69	1.49, 1.91	<0.01	2.00	1.77, 2.27	<0.01	1.64	1.44, 1.86	<0.01
Neither Parent							1.49	1.49, 1.50	<0.01	1.83	1.81, 1.85	<0.01	1.49	1.45, 1.54	<0.01
Social Capital															

	Model 1						Model 2						Model 3					
	AOD Use			AOD Dependence			AOD Use			AOD Dependence			AOD Use			AOD Dependence		
	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value	AOR	95% CI	p Value
Low (ref.)																		
Medium													0.94	0.93, 0.96	<0.01	0.77	0.71, 0.83	<0.01
High													0.79	0.77, 0.81	<0.01	0.60	0.54, 0.67	<0.01
Neighborhood Disorganization																		
Low (ref.)																		
Medium													1.14	1.14, 1.15	<0.01	1.45	1.23, 1.72	<0.01
High													1.42	1.37, 1.48	<0.01	2.60	2.15, 3.14	<0.01

Notes: AOD=Alcohol or/and Drug; AOR=Adjusted Odds Ratios; CI=Confidence Interval; Ref.=reference group; The categories Non-AOD user (reference group), AOD user, and AOD dependent are mutually exclusive categories based on lifetime self-report data.

Table 3
Logistic Regression for Receipt of AOD Treatment Controlling for AOD Use and Dependence

	MODEL 1			MODEL 2			MODEL 3		
	Odds Ratio	95% CI	p Value	Odds Ratio	95% CI	p Value	Odds Ratio	95% CI	p Value
Sex									
Male (ref.)									
Female	0.86	0.73, 1.01	0.06	0.83	0.74, 0.92	<0.01	0.88	0.79, 0.97	<0.01
Age									
12- 13 Years (ref.)									
14-15 Years	1.46	0.90, 2.40	0.13	1.53	0.89, 2.63	0.13	1.52	0.91, 2.53	0.11
16-17 Years	2.01	1.62, 2.50	<0.01	2.13	1.62, 2.81	<0.00	2.10	1.59, 2.76	<0.01
Race/Ethnicity									
White (ref.)									
Black	0.66	0.63, 0.69	<0.01	0.53	0.51, 0.55	<0.01	0.53	0.51, 0.55	<0.01
Hispanic	1.02	0.89, 1.17	0.78	0.90	0.75, 1.09	0.27	0.86	0.74, 1.00	0.06
Other	1.26	1.24, 1.28	<0.01	1.13	1.10, 1.16	<0.01	1.11	1.09, 1.13	<0.01
Grades									
Good (ref.)									
Poor	1.70	1.27, 2.29	<0.01	1.60	1.19, 2.14	0.00	1.46	1.18, 1.82	<0.01
Poverty									
No (ref.)									
Yes				1.12	0.95, 1.32	0.19	1.09	0.93, 1.28	0.29
Health Insurance									
None (ref.)									
Public				1.16	0.91, 1.48	0.23	1.14	0.90, 1.44	0.28
Private				0.80	0.72, 0.90	<0.01	0.86	0.72, 1.02	0.09
Household Composition									
Both Parents (ref.)									
Mom Only				1.30	1.13, 1.50	<0.01	1.28	1.11, 1.47	<0.01
Dad Only				1.50	0.96, 2.35	0.07	1.44	0.84, 2.44	0.18
Neither Parent				2.03	1.43, 2.88	<0.01	1.97	1.47, 2.65	<0.01
Social Capital									

	MODEL 1			MODEL 2			MODEL 3		
	Odds Ratio	95% CI	p Value	Odds Ratio	95% CI	p Value	Odds Ratio	95% CI	p Value
Low (ref.)									
Medium							0.74	0.49, 1.12	0.16
High							0.60	0.36, 1.01	0.06
Neighborhood Disorganization									
Low (ref.)									
Medium							1.35	1.02, 1.77	0.03
High							1.48	1.31, 1.68	<0.01

Notes: AOD=Alcohol or/and Drug; CI=Confidence Interval; Ref.=reference group.