

The Effect of Neighborhood Context on the Drug Use of American Indian Youth of the Southwest

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SUMMARY. This study examined neighborhood effects on the drug use of American Indian youth of the Southwest. We compared these effects with American Indian and non-American Indian youth in order to examine the universality of neighborhood disorganization as a risk factor for drug use. Neighborhood level variables included unemployment, poverty, education, and violent crime rate. Results indicated that American Indian youth were not as adversely affected by these neighborhood factors. American Indian youth may possess cultural characteristics that protect them from the adverse effects of neighborhood disorganization, including close familial relationships and ethnic pride. Culturally competent practice with American Indian youth may best be implemented through the enhancement of relational and cultural strengths as described in the literature. doi:10.1300/J233v06n02_11 [Article copies available for a fee from The Haworth Document Delivery Service: 1-800- HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2007 by The Haworth Press, Inc. All rights reserved .]

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INTRODUCTION

Drug use is one of the major issues facing American Indian populations, including American Indian youth. Research indicates that by 11 years of age, nearly one third of all American Indians have tried alcohol (Mail, 1995; NIAAA), and that 78% of American Indians have tried alcohol, compared with 53% of the general population (Cabape & Howley, 1992; Spicer et al., 2003). Much of the literature has examined the reasons that account for these alarming statistics, such as peer group and family offerers (Kulis, Okamoto, Dixon Rayle, & Nyakoe, 2006) and forced assimilation, colonization, and acculturation (Beauvais, 1998; Frank, Moore, & Ames, 2000; OTA, 1990). In general, these studies have examined the various contexts of drug use for American Indian youth, including the historical and relational contexts that may contribute to its development. However, to date, no studies have examined the possible effects of the neighborhood context on the drug-using behaviors of American Indian youth. While prior studies have examined the neighborhood influence on youth substance use in general (Boardman, Finch, Ellison, Williams, & Jackson, 2001; Dembo, Schmeidler, Burgos, & Taylor, 1985; Schier, Botvin, & Miller, 1999), American Indian youth

may respond differently to these neighborhood contexts due to their unique experiences and position within American society.

Using data from a large-scale drug prevention efficacy trial, this study examined the neighborhood effects on the drug use of American Indian youth of the Southwest. In this study, we compared these effects with non-American Indian youth, in order to examine the universality of neighborhood disorganization as a risk factor for youth drug use. Finally, we explored the role that cultural resiliency might play in protecting youth from adverse outcomes associated with neighborhood disorganization. The implications of this study for understanding the culturally specific etiology of drug use of American Indian youth are discussed.

LITERATURE REVIEW

Social Disorganization and Control

Social disorganization theory suggests that when neighborhoods have higher levels of social and ecological disorder, adolescents who live within them have poorer outcomes on a variety of domains (Sampson & Groves, 1989). For example, Brooks-Gunn et al. (1993) found that neighborhood socioeconomic status was positively related to adolescent intellectual development, even after controlling for the socioeconomic status of the adolescents' families. In addition, young African American female adolescents were found to have higher rates of sexual initiation when they lived in neighborhoods with less professional employment (Brewster, 1994), and disadvantaged neighborhoods had higher levels of teen high school dropouts and delinquency (Chow, 1998) and drug use (Crum, Lillie-Blanton, & Anthony, 1996). Specifically for adolescents, three mechanisms that link social and ecological disorganization to substance use are a lack of social control, a lack of positive role models, and psychological stress.

Social control of young people is challenging in neighborhoods with high social and ecological disorganization, such as those with a high proportion of single parent families, and those with high levels of poverty and crime (Sampson & Groves, 1989). Neighborhoods with a high concentration of single parent families are commonly characterized by increased adolescent risk, even controlling for the fact that these parents (overwhelmingly mothers) are disproportionately likely to be poor (Coulton & Pandey, 1992). The single parents' burden of the sole responsibility for supporting and raising children may lessen the capacity

for monitoring adolescent behavior compared to two-parent households, resulting in increased peer influence toward the acceptance of deviant behaviors such as alcohol and drug use (Oetting, Donnermeyer, & Deffenbacher, 1998; Sampson, 2001). Research suggests that after marital disruption, parents are less effective at monitoring their children. Reasons may include the reduced number of parents in single-parent households, the loss of parental respect by children, and the increased influence of peers (Thornton, 1991).

Additionally, high poverty neighborhoods often lack funding and support for local institutions that may provide societal stability such as clubs, after-school centers, and community groups (Boardman et al., 2001; Pattillo, 1998; Peterson, Krivo, & Harris, 2000). Instead of these prosocial institutions, high poverty neighborhoods typically have a surplus of liquor stores, empty lots, and abandoned buildings (Freisthler, Needell, & Gruenewald, 2005; Peterson, Krivo, & Harris, 2000). These features can increase the availability of substances and provide neighborhood sites for youth to congregate without ready supervision. In addition to poverty, social and ecological disorganization in the form of crime also reduces the monitoring of youth within neighborhoods. Sampson and Raudenbush (1999) found that violent crime in neighborhoods reduced "collective efficacy" in neighborhoods, defined as residents' feelings of cohesion and their willingness to monitor neighborhood children and intervene in their delinquent behaviors.

Another mechanism that links neighborhood social and ecological disorganization to youth substance use is a lack of positive role models. The lack of role models has been often used to describe a wide-ranging set of problems among inner city youth, often focusing on the issues of disadvantage of young African Americans (Wilson, 1987). These problems include single-parent families, early teen sexual activity, and teen childbearing (Brewster, 1994; South & Baumer, 2000; South & Crowder, 2000). With regard to crime and deviance, youth living in disorganized neighborhoods may mimic the behaviors of those who appear the most successful in these communities, which may be violent, gang-affiliated individuals (Massey, 1995; Pattillo, 1998). Selling drugs is often viewed as a way to make money in communities where there are limited opportunities for formal employment. Participating in the drug trade is also one way adolescents can support their own drug habits (Joseph & Pearson, 2002). The high availability and use of drugs and alcohol also promotes harmful role models. In these neighborhoods, youths encounter more pro-drugs norms and they are more likely to see adults drinking

and “getting high” in public (Kadushin et al., 1998; Raudenbush & Sampson, 1999).

Research also suggests that social disorganization can lead to substance use via stress and strain (Boardman et al., 2001). Strain theory predicts that individuals faced with stress and strain will be more likely to be deviant (Agnew, 1985). For example, clinical studies of stress and drug abuse have shown a relationship between these phenomena (Fox et al., 2005; Sinha, 2001). Further, in youth, stress has been found to be correlated with substance use (Hoffman & Su, 1997). Recent research has broadened the notions of stress and strain and expanded them to examine the neighborhood as a root cause of strain. Boardman et al. (2001) proposed that living in highly disorganized neighborhoods stricken with crime and poverty leads to psychological stress and subsequent drug use. A proposed reason for this relationship is that neighborhood disadvantage presents numerous stressors in coping with everyday life in these neighborhoods, and drug use is one strategy of “stress reduction” (Boardman et al., 2001). Thus the stress caused by life in crime and violence-ridden neighborhoods may be an important predictor of adolescent alcohol and other drug use (Dembo et al., 1985; Schier et al., 1999) and may weaken youth resilience.

Another mechanism of stress may be the minority or majority status of a young person within a neighborhood. For example, prior research found that when American Indian youth perceive discrimination, they have higher substance use (Whitbeck, Hoyt, McMorris, Chen, & Stubben, 2001). Other research found that an ethnic group’s size within a school influences the substance use of students from that ethnic group (Kulis, Marsiglia, Nieri, Sicotte, & Hohmann-Marriott, 2004). Being a member of a minority group, relative to the majority ethnic composition of the neighborhood or school, may cause stress and possibly subsequent substance use.

Resiliency Theory

Resilience has been defined as “positive adaptation in response to adversity” (Waller, 2001, p. 292). Related to the concept of resilience are the concepts of risk and protective factors. Matsen and Coatsworth (1998) identify two categories of risk factors: (1) challenging life circumstances (e.g., parental drug use, financial stress in the family), and (2) trauma (e.g., death of a parent, family or community violence). Conversely, protective factors are individual or environmental characteristics that enhance youths’ ability to resist stressful life events and promote

adaptation and competence (Bogenschneider, 1996). Individual protective factors include problem-solving skills, high intelligence, and a strong positive ethnic identity, while environmental protective factors include a sense of community and supportive friends or neighbors (Waller, 2001). Resiliency theory suggests that these factors operate when risks are present to prevent adverse life outcomes (Rutter, 1987).

Recent drug prevention research indicates that risk and protective factors are discrete and separate, and are moderated by gender and ethnicity (Moon, Jackson, & Hecht, 2000). However, the relationship between risk and protection factors and drug use has also been shown to be complex, such that similar circumstances might constitute risk in one situation and protection in another, or might simultaneously present both risk and protection (Waller, Okamoto, Miles, & Hurdle, 2003). This phenomenon is particularly true for American Indian populations, as various environmental contexts (e.g., family, school, neighborhood, and community) tend to be more fluid and may overlap with each other (Waller et al., 2003).

Early conceptualizations of resiliency suggested that protective factors reflected individual attributes. For example, Garnezy, Mastgen, and Tellegen (1984) suggested that resilience consisted of the influence of adaptive personal attributes and stress on the manifested competence of youth. Adaptive personal attributes were thought to function as a kind of "immunity" against life stress. However, contemporary resiliency theorists have challenged this notion in two ways. First, they have argued that resiliency is best conceptualized as a process, rather than an attribute (Bogenschneider, 1996; Rutter, 1987). The term *protective processes* suggests that resiliency is dynamic and reflects a bi-directional relationship between the person and the environment (Waller, 2001). Second, contemporary resiliency theorists emphasize that the concept exists within an ecosystemic context (Bogenschneider, 1996; Waller, 2001). Risk and protective processes occur at several levels of the human ecology, such as the individual, family, and community levels. The ecological risk and protective process model is reflected in research focused in the etiologies of disease (Link & Phelan, 1995) and mental illness and violence (Hiday, 1995), which argue that individually based risk factors must be contextualized in order to understand the development of adverse health outcomes. Finally, contemporary resiliency theorists also emphasize the importance of a strong, positive cultural/ethnic identity (ethnic pride) as a protective factor, which has been supported in recent research on drug use and American Indian youth (Kulis, Napoli, & Marsiglia, 2002).

In addition to the protective effect of ethnic pride (Kulis et al., 2002), a developing body of literature has emphasized the protective effect of immediate and extended family members on drug use and American Indian youth. For example, two focus group studies examined the protective impact of siblings and cousins on the drug use of Southwestern American Indian middle school students (Hurdle, Okamoto, & Miles, 2003; Waller et al., 2003). Because these family members attended schools and lived in the same communities as these youth, Waller et al. suggested that protection is intensified for these youth compared to their non-American Indian counterparts because same-generation family members were present in multiple environmental contexts. These findings were consistent with recent quantitative studies that have illustrated the importance of the relational context on substance use of American Indian youth (Kulis et al., 2006; Okamoto, LeCroy, Dustman, Hohmann-Marriott, & Kulis, 2004). While many minority cultures are collectivist in nature, the research on American Indian youth and drug use is unique, in that it illustrates the influence of interrelationships among same generation peers across multiple environmental contexts (e.g., school, home, reservation and non-reservation communities). This unique impact might protect these youth against factors that typically predispose other youth to risk, such as neighborhood disorganization.

This study examined the impact of one ecosystemic context—the neighborhood—on the drug use of both American Indian youth and non-American Indian youth, and the potential role that resiliency or protective factors may play in their drug use behaviors. This study has implications for understanding the unique social and environmental contributors related to the etiology of drug use of American Indian youth. We hypothesized that, while neighborhood social disorganization will have a harmful impact on substance use for all youth, these effects will differ between American Indian and non-American Indian youth. Due to their strong and unique patterns of ethnic pride and familial bonds, we hypothesized that American Indian youth would exhibit resiliency to their neighborhood social context.

METHOD

Participants

The data for our analyses were from the *keepin' it REAL* substance use prevention study. The *keepin' it REAL* curriculum is a SAMSHA model program that has been shown to be effective in reducing substance use

among adolescents (Hecht et al., 2003). In 1998, researchers recruited 35 Phoenix middle schools to participate in the program. These 35 schools represented more than 75% of all the middle schools in the city of Phoenix. Of the 35 schools, 25 were randomly chosen as treatment schools that received the *keepin' it REAL* program, and 10 were designated as control schools and received the standard substance prevention program already in place. Before the *keepin' it REAL* program was implemented, baseline assessments were conducted on students in all 35 schools. This pretreatment survey measured 7th grade students' past experience with substance use, their norms towards substance use, and ethnic and demographic background information. The pretreatment surveys were self-administered by students, and were available in both English and Spanish translations. Survey administrators from the research team conducted the survey during regular class periods and responded to student questions regarding completion of the survey. Although some students were not present to take the survey due to absences, 87% of enrolled students in the 7th grade completed the pretreatment survey instrument. After the initial survey interviews in fall, 1998, the *keepin' it REAL* program was implemented in the treatment schools, and a post-treatment interview was conducted in all schools in the spring of 1999. Two additional post-treatment interviews were conducted once the students had progressed to the 8th grade. Because our aim was to examine how patterns of American Indian substance use differed from non-American Indian adolescents before intervention, our analysis utilized the data only from the pre-treatment interview.

We also use data from the neighborhoods in which the adolescents' schools were located. The source of the data is a combination of United States Census data and data from the city of Phoenix. Students in a school were assigned the neighborhood measures from the census tract or tracts of the school's official enrollment boundaries. These boundaries, carved through 10 separate school districts, yielded 35 school enrollment areas using data obtained from the Arizona Department of Education. It is possible that the areas in which the students actually lived may not have been the same area in which their school was located. Parents could enroll children in schools that were outside the boundaries of their home school's district, but such transfers are uncommon, and nearly all children within each area lived nearby. Even for the relatively few cases where the school's census tract did not match the home of the student, the characteristics of the neighborhood surrounding the school should most likely be an important influence. The school is a location that students frequent on a regular basis, and thus exposure to the

school's surrounding neighborhood is likely to be high, forming another context in which young people receive socialization (Bronfenbrenner, 1989).

Substance Use Measures

The three main substances assessed in the pre-treatment survey were the use of alcohol, cigarettes, and marijuana. Other substances were also examined, but for this age group in 1998, their use was too rare to be effectively analyzed. Less than 5% of respondents said they had any lifetime experience with cocaine, crack, LSD, PCP, heroin, downers, speed or crystal methamphetamine. Use of alcohol was measured by a question that asked, "How many drinks of alcohol have you had in the past 30 days?" The response categories were a nine point ordinal scale, that varied from "none" and "only sips" on the low end to "8-15 drinks," "16-30 drinks," and "more than 30 drinks" on the high end. Using similar ordinal scales, cigarette use was measured with a question that asked, "How many cigarettes have you smoked in the past 30 days?" and marijuana use was measured by asking, "How many hits of marijuana have you had in the last thirty days?" Because substance use measures tended to be skewed, they were transformed with a logarithmic function.

Neighborhood Measures

Using ArcView (GIS) software, neighborhood level variables were constructed by mapping census tracts on to each school's official enrollment boundaries. Enrollment boundaries, however, did not consistently correspond to census tracts in our study. When an enrollment boundary was completely contained within a single census tract, that tract's characteristics were assigned to the school. When an enrollment boundary spanned multiple census tracts, data was proportionately assigned, by geographic area, from each spanned census tract to the school. For example, if 50% of a census tract fell into an area, ArcView designated 50% of the population within that tract to that area.

Neighborhood level variables constructed from the 2000 U.S. Census Summary File 1 or Summary File 3 were used in this study, and included the percent of individuals in the school enrollment area who (a) were unemployed, (b) lived in poverty, and (c) possessed less than a high school education. A fourth neighborhood level variable the violent crime rate per 1,000 people was constructed from Phoenix Police Department reports that provided the geographic location of crimes.

These four neighborhood variables were chosen to match important dimensions identified by the social disorganization literature (Sampson & Groves, 1989; South & Baumer, 2000; Wilson, 1987). Unemployment captures economic hardship, distressed neighborhoods, and a lack of role models in steady jobs. Low levels of education also represent economic disadvantage and a dearth of role models for higher educational aspirations. Neighborhoods with high levels of poverty lack community institutions that provide social control, such as clubs and community groups. Crime in neighborhoods may be a source of stress, and may be linked to negative role models for violent and drug behaviors.

Student Characteristics

Ethnicity was assessed through student responses to the question "What is your race/culture?" American Indian status was coded 1 if the student marked American Indian affiliation, and 0 otherwise. Students were allowed to choose as many ethnic and racial identities as desired. Students without any American Indian heritage were the reference group. Although this group contains all other students, they are mostly students of Latino origin. Several basic sociodemographic controls were also included: gender, grades, and free or reduced lunch status. Grades were self-reported and measured on a scale from 1 (mostly F's) to 9 (mostly A's). Socioeconomic status was captured with a dummy variable that indicated if the students received free or reduced lunches through the Federal school lunch program. Because students may not accurately know their household income, free or reduced lunch status is a frequent way of collecting socioeconomic measures from school-based surveys of students (Bankston & Caldas, 1996; Gerard & Buehler, 1999).

Analysis

We use linear regression to predict the level of alcohol, cigarette, and marijuana use in the last 30 days. Because we examined American Indian youths' resiliency within neighborhood social disorganization, we estimated models in which we interacted the American Indian measure with the neighborhood measures. A significant interaction coefficient for this term indicates the effect of neighborhoods is significantly different for American Indian compared to other youth.

Multilevel modeling techniques addressed the issue of clustered data. Because students were sampled in 35 schools, there is non-independence between students in the same school. This violation of regression

assumptions biases the estimates, most likely in the form of deflated standard errors. Multilevel or hierarchical modeling procedures incorporated the clustered data and protected against Type I error (i.e., wrongly rejecting the null hypothesis). We used PROC MIXED in SAS 9.1 to estimate multilevel models with random intercepts, which allowed for different schools to have different base levels of drug use (Raudenbush & Bryk, 2002).

RESULTS

Table 1 presents descriptive statistics for the sample. In terms of substance use in the last 30 days, the average level of use among 7th grade adolescents tended to be low. Alcohol use averaged 1.8 on the 9 point scale, which was between the categories of “none” and “only sips.” Cigarette use averaged 1.3, which was between “none” and “only one puff.” Marijuana use averaged 1.5, which was between “none” and “one small hit.” Behind these low averages, however, there was substantial variation in use. Although not shown in Table 1, in the last 30 days, about 5% of students had more than 4 drinks, about 6% of students had more than 2 cigarettes, and about 7% of students had more than 4 hits of

TABLE 1. Descriptive Statistics

	Mean	Std.Dev	Minimum	Maximum
Substance Use in Last 30 Days (Ordinal Scales)				
Alcoholic Drinks	1.84	1.65	1.00	9.00
Cigarettes	1.32	1.03	1.00	8.00
Marijuana	1.51	1.46	1.00	8.00
Neighborhoods				
% Unemployed	0.09	0.04	0.03	0.30
% In Poverty	0.23	0.09	0.05	0.54
% Less than HS Education	0.46	0.18	0.07	0.70
Total Crime Rate	206.74	97.98	6.45	543.63
American Indian (1 = Yes, 0 = No)	0.10	0.30	0.00	1.00
Male (1 = Yes, 0 = No)	0.51	0.50	0.00	1.00
Grades (1-9 scale)	6.60	1.83	1.00	9.00
Free/Reduced Lunch (1 = Yes, 0 = No)	0.83	0.38	0.00	1.00

marijuana. Thus, some students in this population are regular monthly users of these substances.

The demographics of the sample indicated that 10% of the students claimed at least partial American Indian heritage. Of the American Indian students, 28% claimed exclusive American Indian heritage, suggesting that most of the American Indian students were multiracial. The sample was equally divided by gender (51% male), and students' self-reported grades averaged 6.6 on the 1 to 9 scale, which was between categories "B's and C's" and "mostly B's." A very large portion of the sample (83%) was receiving free or reduced cost lunches, which indicates a high level of economic disadvantage in this population of students. The school context was particularly relevant for our sample, as almost all of the American Indian youth in the study attended schools outside of their reservation communities. In this way, they were considered "urban" or "semi-urban" in nature.

The neighborhood measures suggested substantial variation in the social disorganization present near the students' schools. Unemployment averaged 9% (range = 3% to 30%), the average poverty level was 23% (range = 5% to 54%), and the percent of adults over age 25 without a high school diploma was 46% (range = 7% to 70% across neighborhoods). Lastly, crime data from the city of Phoenix showed that the total crime rate averaged about 207 incidents per 1000 people. From these neighborhood statistics, it is clear that the students in the population came from a wide variety of neighborhoods. When we compared differences in neighborhood social disorganization across American Indian and non-American Indian youth (table not shown), American Indian youth went to school in neighborhoods with slightly less unemployment (8% versus 9%), poverty (21% versus 24%), and adults without high school diplomas (42% versus 47%). The crime rate, however, was modestly higher in the American Indian neighborhoods (217 versus 206). T-tests comparing neighborhood conditions indicated that these differences across the two groups of students were significant at the .05 level.

In the multivariate tables, we examined if the effects of these neighborhood conditions varied by whether or not the student has claimed American Indian affiliation. Table 2 examines alcohol use in the last 30 days. In model 1, higher grades are significantly protective against alcohol use. Free or reduced lunch receipt, as a proxy of socioeconomic status, is also negatively correlated with use. Being male as opposed to female, however, was not a significant predictor of alcohol usage.

A significant test statistic for the interaction between a neighborhood measure and the American Indian indicator is evidence that neighborhood

TABLE 2. Neighborhoods, American Indian Status, and Logged Alcohol Consumption

	1	2	3	4
Neighborhoods				
% Unemployed	0.23 (0.51)			
% Unemployed * American Indian	-2.13* (0.96)			
% In Poverty		0.00 (0.22)		
% In Poverty * American Indian		-0.91** (0.33)		
% Less than HS Education			0.14 (0.13)	
% Less than HS Education * American Indian			-0.40* (0.17)	
Total Crime Rate				0.05* (0.02)
Total Crime Rate * American Indian				-0.01 (0.03)
American Indian	0.18* (0.08)	0.20* (0.08)	0.17* (0.08)	0.03 (0.07)
Male	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Grades	-0.05*** (0.01)	-0.05*** (0.01)	-0.05*** (0.01)	-0.05*** (0.01)
Free/Reduced Lunch	-0.10*** (0.03)	-0.10** (0.03)	-0.11*** (0.03)	-0.10*** (0.03)
Intercept	0.74*** (0.07)	0.76*** (0.07)	0.70*** (0.08)	0.67*** (0.06)
N	4137	4137	4137	4137

Coefficients are estimates from multilevel linear regression

Standard errors are in parentheses

*p < .05

**p < .01

***p < .001

effects vary by American Indian status. In model 1, the interaction between neighborhood unemployment and American Indian affiliation was significant and negative. For non-American Indian students, each 1 percent increase in neighborhood unemployment increased logged alcohol consumption by .0023 units ($.01 * .23 = .0023$). Conversely, for American Indian students, a one percent increase in unemployment decreased alcohol consumption by .019 units ($.01 * .23 - .01 * 2.13 = -.019$). The test statistic for the interaction indicated that the difference in these two slopes (.0023 and $-.019$) was significant. In model 2, similar results were found for neighborhood poverty—the significant interaction suggests that American Indian students showed resiliency to neighborhood poverty that was not seen for non-American Indian students. In model 3, the percent of residents in the neighborhood with less than a high school diploma tended to increase the rate of alcohol consumption for non-American Indian students, whereas for American Indian students, alcohol consumption decreased. As with the previous models, the significant interaction term is evidence that the slopes between American Indian and non-American Indian students are different. In model 4, however, there was no evidence that the total crime rate affected alcohol consumption differently across either of the student groups.

The main effects of neighborhood variables in models 1 through 3 were not significant. This means that for the reference group (non-American Indian students), neighborhood unemployment, poverty, and education were not significantly related to substance use. This finding is similar to previous studies of this population, which found weak neighborhood effects on substance use (Kulis, Marsiglia, & Nieri, 2004). However, the significant interaction coefficients in models 1 to 3 showed that these neighborhood effects differed significantly for American Indian and non-American Indian students—even if the main effects were not significant. The main effect in model 4 was significant, which indicated that the total crime rate had a positive effect on alcohol consumption for non-American Indian youth. In addition to models 1 through 4, we also estimated a combined model that included all four neighborhood variables (results not presented). In this combined model, however, none of the interactions were significant. This suggests that the neighborhood variables are related, and they represent an underlying dimension of neighborhood disadvantage.

Table 3 repeats these same models, but for cigarette consumption. The overall pattern of results for cigarettes was similar to the results for alcohol, although the effect of free or reduced price lunch was no longer

TABLE 3. Neighborhoods, American Indian Status, and Logged Cigarette Consumption

	1	2	3	4
Neighborhoods				
% Unemployed	0.15 (0.24)			
% Unemployed * American Indian	-1.95* (0.64)			
% In Poverty		0.14 (0.10)		
% In Poverty * American Indian		-0.79*** (0.22)		
% Less than HS Education			0.06 (0.05)	
% Less than HS Education * American Indian			-0.35** (0.12)	
Total Crime Rate				0.01 (0.01)
Total Crime Rate * American Indian				0.03 (0.02)
American Indian	0.23*** (0.06)	0.25*** (0.05)	0.22*** (0.05)	0.01 (0.04)
Male	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Grades	-0.03*** (0.00)	-0.03*** (0.00)	-0.03*** (0.00)	-0.03*** (0.00)
Free/Reduced Lunch	-0.03 (0.02)	-0.04 (0.02)	-0.04 (0.02)	-0.03 (0.02)
Intercept	0.37*** (0.04)	0.35*** (0.04)	0.36*** (0.04)	0.37*** (0.04)
N	4145	4145	4145	4145

Coefficients are estimates from multilevel linear regression

Standard errors are in parentheses

*p < .05

**p < .01

***p < .001

significant. Neighborhood unemployment, poverty, and low educational attainment appeared to decrease cigarette use for American Indians, while for non-American Indian students these slopes were positive. The main effects were not significant, but the interaction coefficients were, indicating significant differences in effects across the two groups of students. As before, the effects of the total neighborhood crime rate did not significantly differ for the two groups.

Lastly, Table 4 examined marijuana use in the last 30 days. The results in Table 4 differed from the prior substances in that the interaction results were not as robust. The signs of the interactions in models 1 to 3 were identical to the coefficients in Table 2 and Table 3 (negative), but only one interaction—American Indian * neighborhood poverty was significant. The main effects of neighborhood variables were significant in models 1 to 3, which suggested that these neighborhood conditions increased marijuana use for non-American Indian students.

DISCUSSION

This study examined the effects of neighborhood contexts on the drug use of an ethnically diverse sample of youth living in the Southwest. Drawing upon social disorganization and resiliency theories, we hypothesized that different neighborhood contexts might affect the drug use among American Indian youth differently compared to non-American Indian youth. Specifically, we compared the resulting effects with non-American Indian youth in order to examine the universality of neighborhood disorganization as a potential risk factor for youth drug use. We also explored the role that cultural resiliency might play in protecting American Indian youth from adverse outcomes associated with neighborhood disorganization.

Initial results revealed that a large proportion of the youth in our sample were from economically disadvantaged families/neighborhoods based on the percentage of students receiving free or reduced cost lunch and local crime statistics. In addition, it was evident that varying levels of social disorganization existed around the youths' school settings. Demographic results of drug use behavior suggested that varying percentages of the total sample of 7th grade students, which typically range in age from 11-13 years, had participated in regular monthly drug usage. For alcohol and cigarettes, the differences in the slopes of neighborhood effects between American Indian and non-American Indian youth were significant for neighborhood unemployment, poverty, and education. For marijuana, the

TABLE 4. Neighborhoods, American Indian Status, and Logged Marijuana Consumption

	1	2	3	4
Neighborhoods				
% Unemployed	1.21***			
	(0.35)			
% Unemployed * American Indian	-0.69			
	(0.8)			
% In Poverty		0.37*		
		(0.15)		
% In Poverty * American Indian		-0.60*		
		(0.28)		
% Less than HS Education			0.24**	
			(0.09)	
% Less than HS Education * American Indian			-0.25	
			(0.14)	
Total Crime Rate				0.02
				(0.01)
Total Crime Rate * American Indian				0.03
				(0.02)
American Indian	0.16*	0.23***	0.21**	0.04
	(0.07)	(0.07)	(0.07)	(0.05)
Male	0.07***	0.07***	0.07***	0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Grades	-0.05***	0.05***	0.05***	0.05***
	(0.00)	(0.00)	(0.00)	(0.00)
Free/Reduced Lunch	-0.09***	-0.09***	-0.09***	-0.07**
	(0.02)	(0.03)	(0.03)	(0.02)
Intercept	0.45***	0.47***	0.45***	0.52***
	(0.05)	(0.05)	(0.06)	(0.05)
N	4130	4130	4130	4130

*p < .05
 **p < .01
 ***p < .001
 Standard errors are in parentheses

differences in neighborhood effects were less robust, with only poverty showing a different effect according to American Indian status.

Thus, when exploring possible differences between non-American Indian youth and American Indian youth, we found significant differences in the effects of neighborhood contexts on the alcohol, cigarette, and marijuana use behaviors. The current findings reveal somewhat unexpected trends among the American Indian youth participants. Our findings might suggest that the American Indian youth in our sample were "super-resilient" to socially disorganized neighborhoods and factors that traditionally have been found to negatively influence drug use behaviors among adolescents (Brooks-Gunn et al., 1993; Sampson & Groves, 1989; Sampson & Raudenbush, 1999). Instead, it was the non-American Indian youth that appeared to be using drugs more frequently when living within in these neighborhoods, despite past studies that reveal that American Indian youth actually report significantly greater drug usage (Cabape & Howley, 1992; Spicer et al., 2003). This "super resiliency" might have been the result of supportive immediate and extended family members in their ecosystem, which has been found to be a protective factor for American Indian youth in prior studies (Hurdle et al., 2003; Waller et al., 2003). Future research should examine the relative contributions of multiple environmental systems in which American Indian youth are exposed and embedded, in order to further delineate the separate and combined effects of family members, friends/peers, and neighborhood contexts on drug use decisions for American Indian youth.

Another interpretation of the findings might be that the American Indian youth in our sample were in the ethnic, social, and economic minority in neighborhoods with higher socioeconomic status, prompting them to use drugs to cope with the ecological stress associated with this status in their communities. In other words, these youth may have been considered relatively poor or from disadvantaged families in their communities, and therefore experienced greater stress and discrimination from living in these neighborhoods in which their peers and neighbors were better off socioeconomically. American Indians were only 2.0% of the Phoenix population in 2000 (U.S. Bureau of the Census, 2000), and thus American Indian youth were likely to be a small minority in most social settings within Phoenix. As mentioned earlier, compared to non-American Indian youth, the American Indian youth in the sample also went to schools in neighborhoods that had lower levels of unemployment and poverty, and higher education levels. Because these youth may have not felt as if they fit in within their neighborhoods, the

stress of believing that others were watching them more often may have led to their drug usage. This interpretation of our findings is consistent with prior research, which has shown that perceived discrimination can be a pathway to substance use in American Indian youth (Whitbeck et al., 2001). Future research should focus on American Indian youths' perceptions of their neighborhoods, how they view themselves fitting in within these contexts, and whether they feel comfortable in the neighborhoods within which they live.

Another explanation for our findings may be considered within the context of social desirable responding. Social desirable responding is the tendency of individuals to cast themselves in a positive light according to current cultural norms when answering questions in a research study (Messick, 1960; Paulhus, 1984). The adolescents in this study were asked to reflect upon their actual drug usage behaviors within the last 30 days and they were sure to know that their responses would be examined and reported. They may have reported less drug usage in order to "better" themselves and their current life situations, which in turn may have helped them feel better and view themselves more positively (Paulhus).

Interestingly, there were no significant differences in alcohol, cigarette, and marijuana use between American Indian and non-American Indian youth based on neighborhood crime rates. Community level poverty and crime have been found to reduce the monitoring of youth within neighborhoods (Sampson & Raudenbush, 1999) and have led to youth crime and deviance (Massey, 1995; Pattillo, 1998) such as the selling and trafficking of drugs as well as drug usage. Contrary to these research findings, our results also indicated no direct link between American Indian youth drug use and neighborhood crime rates. This suggests that these youth in our sample may have experienced neighborhood crime and drug use as separate events within their ecosystem, which did not have an influence on each other. As such, neighborhood crime did not appear to directly affect American Indian youths' decisions to use drugs in our study.

Finally, with regard to the reported drug use behaviors of American Indian youth in our study, it is important to note the distinct differences between cultural/ceremonial and neighborhood recreational drug use for American Indian youth. Hallucinogens and other drugs play critical roles at valued tribal and familial cultural activities; however, this practice represents religious and spiritually sanctioned use of substances and is believed to reinforce cultural cohesion and commitment (Grob, 1994; Grob & Dobkin de Rios, 1996). Most likely, based on the framing of the

survey questions, the American Indian youth in this study were not reporting drug use that occurred in culturally appropriate situations.

LIMITATIONS OF THE STUDY

The generalizability of this study's findings are limited because our sample included American Indian youth in public middle schools which include a majority of non-American Indian students in a large southwestern metropolitan area, and nearly all the American Indian youth lived off tribal reservations. Further, the American Indian sample consisted of youth with complex multi-ethnic identities, as more than two thirds of the sample claimed American Indian ethnicity with another ethnic affiliation (e.g., Mexican). This may limit the generalizability of the findings to American Indian youth in primarily reservation communities or those of "pure" descent. Additionally, there are 562 federally recognized tribes across the U.S. (Bureau of Indian Affairs, 2002) and numerous non-recognized tribes, with significant cultural and regional differences such as living situations, degree of Indian ancestry or blood quantum, and cultural affiliation, identity, and participation (Hawkins, Cummins, & Marlatt, 2004). The findings from the current study may not reflect these differences, and thus may not be generalizable to American Indian youth across the U.S.

Another limitation from our study reflected the lack of precision in the measurement of neighborhood variables. Specifically, the four measures of neighborhood social disorganization were correlated with each other, suggesting an underlying dimension of neighborhood disadvantage. Therefore, it was not possible to identify which specific features of neighborhoods were related to American Indian resiliency. Further, the data lacked the ability to control for parental-level variables (e.g., unemployment, education). Thus neighborhood measures of unemployment or education could partially reflect individual-level phenomena.

CONCLUSIONS

Despite these limitations, findings from this study have implications for furthering our understanding of the possible effects of social disorganization and neighborhood contexts on the reported drug use among American Indian and non-American Indian youth. The results contribute to our knowledge of resiliency and protective factors that exist among American Indian youth in the Southwest in regard to neighborhood

drug use behaviors. The differences in American Indian and non-American Indian drug use patterns based on neighborhood factors from this study contribute to a larger body of future research related to the ecological risk and protective factors for American Indian youth and Indigenous youth populations. Further, the findings from this study may also inform drug prevention programs for these youth, particularly in their incorporation of neighborhood and school contexts that place these youth at risk for drug use. Future research might explore these phenomena, as well as examine other culture-specific aspects of drug use risk and resiliency with American Indian youth in a variety of regional contexts across the U.S.

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