Substance Use & Misuse, 45:2323–2339

ISSN: 1082-6084 (print); 1532-2491 (online)
DOI: 10.3109/10826084.2010.484320

informa
healthcare

Special Populations: Indian Youth

Differences in Illicit Drug-Use Rates Among Oklahoma and Non-Oklahoma Indian Youth

SARAH L. TRAGESSER,[1] FREDERICK BEAUVAIS,[2] MARTHA BURNSIDE[2] AND PAMELA JUMPER-THURMAN[2]

[1]Washington State University, Department of Psychology, Richland, Washington, USA
[2]Colorado State University, Fort Collins, Colorado, USA

Demographic factors may serve as risk or protective factors for drug use in American Indian communities. The purpose of the present study was to compare drug-use rates among Oklahoma and Non-Oklahoma Indian youth, and test corresponding rates of preventative and protective community, family, and social–demographic factors. Participants' data included 1,928 Indian 7th–12th graders from non-Oklahoma schools and 1,938 Indian students from schools in Oklahoma, aggregated across 2–3 years from an ongoing survey study of substance use and prevention among Indian youth. As predicted, one-way analysis of variance tests indicated that Oklahoma youth showed lower rates of drug use, later ages of initiation of drug use, and greater levels of perceived harm from using drugs. These differences were reflected in the predicted protective factor differences, including higher levels of exposure to anti-drug campaigns in the community and schools, greater family involvement in drug-use prevention, and lower levels of peer drug associations. The strength of these protective factors is illustrated by the fact that drug-use rates were lower among Oklahoma youth despite the perception among Oklahoma youth that drugs were more available, compared with non-Oklahoma youth. Limitations and suggestions for future research are noted.

Keywords substance use; prevention; American Indian youth; community; adolescents

Introduction

Thirty years of surveillance of drug use among American Indian adolescents has demonstrated that Indian youth living on reservations are at some elevated risk for substance abuse compared with their non-Indian peers (Beauvais, Jumper-Thurman, Helm, Plested, and Burnside, 2004). While there is some indication that there may be differences in

This research was supported by a grant from the National Institute on Drug Abuse of the National Institutes of Health (R01 DA03371).

Address correspondence to Sarah Tragesser, Assistant Professor Department of Psychology, Washington State University, 2710 University Drive, Richland, WA 99354; E-mail: stragesser@tricity.wsu.edu

rates of use between regionally separated cultural/language groups, the consistent finding has been that, as an aggregate, rates have been higher for Indian youth (see Beauvais et al., 2004; Beauvais and LaBoueff, 1985; Beauvais, Chavez, Oetting, Deffenbacher, and Cornell, 1996). The cited studies have focused largely on those Indian youth living on reservations whose lands are set aside by the federal government, for exclusive use of and governance by Indian tribes. Typically, these are in rather remote areas and reservations have experienced substantial socioeconomic hardship over the years. There are, however, a significant number of Indian youth who do not live on reservations and thus have a different social context that may affect their rates of drug use. This article will focus on one such group—Indian youth in the State of Oklahoma. With a few exceptions, most Oklahoma tribes do not occupy reservations as such, rather they live on or near "historic tribal lands" that maintain some level of tribal jurisdiction. While Oklahoma Indian youth may live in areas where there is a concentration of tribal members, they are less isolated from their non-Indian peers than reservation youth might be. One important result of this is that Oklahoma Indian youth mainly attend public schools with non-Indian youth and, in contrast to most reservation youth, may not constitute the majority of youth in the schools. This provides a different social context that may have an effect on drug-use rates and patterns. The demographic configuration experienced by Oklahoma Indian youth may also result in other social differences that set them apart from reservation youth.

While personality traits and other individual characteristics appear to play a role in the risk for substance abuse problems (e.g., Oetting, Swaim, Edwards, and Beauvais, 1989; Weinberg, Rahdert, Colliver, and Glantz, 1998), social and environmental factors continue to be of central focus and provide a powerful explanatory paradigm for youth drug use and prevention (Argawal, Lynskey, Bucholz, Madden, and Heath, 2007; Beauvais, Wayman, Jumper-Thurman, Plested, and Helm, 2002; Oetting and Beauvais, 1987a; Oetting and Donnermeyer, 1998). Peer influence continues to be of central focus, as nearly every large-scale study, whether it be cross-sectional or longitudinal, has concluded that one's peer behavior and influence is one of the strongest predictors of drug use (Ary, Tildesley, Hops, and Andrews, 1993; Chavez, Deffenbacher, and Wayman, 1996; D'Amico and McCarthy, 2006; Graham, Marks, and Hansen, 1991; Guo, Hill, Hawkins, Catalano, and Abbott, 2002; see Hawkins, Catalano, and Miller, 1992 for a review; Hawkins, Lishner, Catalano, and Howard, 1985; Kandel, 1985; Kobus, 2003; Oetting and Beauvais, 1987a, 1987b; Swaim, Bates, and Chavez, 1998). In addition, family factors are receiving increasing attention (e.g., Dick et al., 2007). Family factors are consistently associated with levels of adolescent drug use (see Hawkins et al., 1992 for review; Oetting, Beauvais, and Edwards, 1989; Resnick et al., 1997; Velleman, Templeton, and Copello, 2005; Younge, Oetting, and Deffenbacher, 1996), and their influence is increasingly being demonstrated in studies of family-based prevention and intervention programs (Mason, Kosterman, Hawkins, Haggerty, and Spoth, 2003; Sale et al., 2005) as well as longitudinal investigations (Simons-Morton and Chen, 2005). More distally, school, religious affiliation, and community contexts provide an umbrella of risk or protective factors (Battistich and Hom, 1997; Napoli, Marsiglia, and Kulis, 2003; Oetting et al., 1989; Oetting, Donnermeyer, and Deffenbacher, 1998; Resnick et al., 1997; Yu and Stiffman, 2007). According to Primary Socialization Theory (Oetting and Donnermeyer, 1998; Oetting et al., 1998), these socialization factors are expected to operate to socialize youth into either prosocial or antisocial norms and to shape beliefs such as perceptions of risk associated with drug use.

As a broad proxy for the collective social set of drug-use-related variables, the demographic context in which a youth lives should lead to varying rates and patterns of drug use when these contexts differ. Intuitively, for instance, one would expect differences between

youth growing up in an inner city environment that is rife with drug use and sales, and fewer prosocial socialization influences, and a youth growing up in a more prosperous and protected environment that may have a strong religious tradition or other prosocial influences. These larger community level effects have also been demonstrated as being important moderators in twin studies (Dick, Rose, Viken, Kaprio, and Koskenvuo, 2001).

On a national scale, demographic differences in drug-use rates have been found for high school seniors in different regions of the United States. Johnston, O'Malley, and Bachman (2004) report that the South has lower rates of overall drug use. The rates for the use of "any illicit drug" in the past year are as follows: Northeast (44%), West (41%), North Central (40%), and South (35%). Additionally, some differences in rates of drug use were found for community size, level of parental education, and racial/ethnic background. While the overall conclusion of this study is that the differences found are not large, it is clear that there is some demographic influence on the rates of drug use among adolescents.

Given the demonstrated effects of differing socio-demographic influences on drug-use behavior, it is reasonable to expect that there may be differences in these behaviors between Oklahoma Indian youth and Indian youth living on reservations. The purpose of the present study was to test (a) whether there are expected differences between Oklahoma Indian youth and Indian youth living on reservations in terms of rates of drug use, and (b) whether or not there are corresponding differences in risk and protective factors that are predicted on the basis of Primary Socialization Theory (PST; Oetting and Donnermeyer, 1998; Oetting et al., 1998). The protective factors emphasized by PST are community transmission of prosocial norms (e.g., anti-drug campaigns), family transmission of prosocial norms (e.g., communication and sanctions against drug use), and peer transmission of prosocial norms (e.g., extent to which peers try to stop friends from using drugs). The level of encouragement of prosocial norms is expected to reflect beliefs (e.g., perceptions of harm from drug use) and behaviors (e.g., drug use in past 30 days or past year, age of first use).

Method

The present data were selected from a larger ongoing study of substance use and prevention among Indian youth. Eight to twelve schools are surveyed per year to contribute to this larger dataset. It is our standard policy to not identify the tribes with which we work in order to respect the confidentiality and reputation of the communities participating in this research. Each year a sample of reservations is selected that includes tribes from the major cultural/linguistic groups of American Indians. While this approach provides demographic distribution, care is also taken to ensure that reservation or community size and socioeconomic variability are sampled. A separate sampling frame is used to collect data from Oklahoma Indian youth. The State of Oklahoma, geographically, is represented by Woodlands tribes and Plains tribe with the former occupying primarily the eastern part of the state and the latter the western part. Each year 10 schools that have at least a 20% enrollment of Indian students are selected for survey from each half of the state. This ensures some degree of cultural representation. Data are aggregated and reported over a 2–3-year span to provide stable samples of youth. Each data point includes from 1,500 to 2,500 students. Some schools elect to give the survey over multiple years but the same school is never included more than once for a given data point. Specifically excluded from the sample are youth from Alaska. Note that the selection procedure used in this project is not based on the assumption that all reservations/tribes are culturally similar. Rather it is an attempt to sample the cultural variability that occurs in Indian communities. The surveys are given to all youth attending the selected schools and thus the results are limited to youth

attending school and do not represent the drug-use rates of school absentees or dropouts. In a previous paper, we documented the effects from not including school dropouts (Beauvais et al., 1996). As might be expected, given the higher rates of drug use among dropouts and the high rate of dropping out among Indian youth, school-based data underestimate drug use of the entire age cohort.

Participants

Participants' data selected for the present analysis included 1,928 Indian 7th–12th graders from non-Oklahoma schools and 1,938 Indian students from Oklahoma schools matched on the basis of age. The non-Oklahoma sample consisted of all Indian youth attending schools on or near reservations. The Oklahoma sample included all Indian youth attending schools in areas of high Indian concentration; the schools had to have an enrollment of greater than 20% Indian youth. This sample composed of 51% female with an average age of 15.01 years. Because of possible developmental differences across grades, participants were separated into two groups (7th–9th graders and 10th–12th graders). The 7th–9th grade group consisted of 2,217 youth and the 10th–12th grade group consisted of 1,629 youth.

Materials

The survey that is used with Indian youth (The American Drug and Alcohol Survey™) has been developed and refined over the course of the project and has proven highly effective in eliciting reliable and valid drug-use information from ethnic minority populations and in particular American Indian youth (Oetting and Beauvais, 1990). These data have been used in a variety of ways, such as providing each tribe with a comprehensive report of their drug-use rates for use in seeking program funding and design and in evaluation of prevention programs. In addition, the database has provided a rich source of information for examining the etiology of substance use. Reliabilities for the various scales on the survey range from.78 to.95.

Drug-use variables included lifetime, annual and 30-day prevalence (see Tables 1–3 for the list of substances asked about). Lifetime use was measured by asking participants if they had "ever" tried each drug with "yes" and "no" response categories. For annual prevalence the question for each drug was "Have you used ____ to get high in the last 12 months" with six response categories ranging from "None" to "50 or more times." A similar question was used for use in the last month with six categories from "None" to "20 or more times."

Age of first use for getting drunk or using marijuana or inhalants was measured by the items, "How old were you the first time you 'got drunk?' or 'used___.'" The age categories ranged from "less than seven" to "greater than 19."

Perceived harm was measured using items "How much do you think people harm themselves (physically or otherwise) if they 'get drunk,' or 'use____ regularly?"' (see Table 7 for the substances asked about). Responses were on a 4-point scale from "No harm" to "A lot of harm."

Family variables included the extent to which parents care whether or not youth use substances (4-point scale, from "not at all" to "a lot") as well as whether family members would try to stop substance use (same scale as above); see Table 4 for items.

Peer variables consisted of items asking participants the extent to which their friends would stop them from using drugs (4-point scale, "not all" to "a lot"), how many of their

Table 1
Percentages of Indian Oklahoma and non-Oklahoma students who have ever tried substances by drug and grade level

	7th–9th		10th–12th	
Variable	Non-Oklahoma	Oklahoma	Non-Oklahoma	Oklahoma
Gotten drunk	44	25*	66	54*
Marijuana	63	28*	79	51*
Uppers	10	6*	13	10*
Cocaine	10	4*	22	7*
Crack	8	4*	11	5*
Inhalants	13	9*	11	7*
LSD	5	3*	11	4*
Other psychedelics	10	4*	18	7*
Heroin	3	3	3	3
Crystal meth	8	4*	13	5*
N	1,112	1,117	816	821

*$p < .05$.

friends use drugs (4-point scale, "none" to "all of them"), and the extent to which their friends ask them to use drugs (4-point scale "not at all" to "very often"); see Table 5.

Perceived availability was measured using the item, "How easy do you think it would be for you to get each of the following types of drugs if you wanted some?" (see Table 8), rated on a 5-point scale from "Very Easy" to "Probably Impossible."

Table 2
Percentages of Indian Oklahoma and non-Oklahoma students who have used in the past year by drug and grade level

	7th–9th		10th–12th	
Variable	Non-Oklahoma	Oklahoma	Non-Oklahoma	Oklahoma
Gotten drunk	33	17*	48	40*
Marijuana	54	21*	63	38*
Uppers	4	4	7	8
Cocaine	7	2*	15	5*
Crack	5	2*	7	3*
Inhalants	9	7*	3	3
LSD	3	1*	6	2*
Other psychedelics	3	2	7	3*
Heroin	2	2	2	0*
Crystal meth	4	2*	10	4*
N	1,112	1,117	816	821

*$p < .05$.

Table 3
Percentages of Indian Oklahoma and non-Oklahoma students who have used in the past 30 days by drug and grade level

	7th–9th		10th–12th	
Variable	Non-Oklahoma	Oklahoma	Non-Oklahoma	Oklahoma
Gotten drunk	20	10*	29	22*
Marijuana	40	13*	46	21*
Uppers	2	2	3	4
Cocaine	4	1*	6	2*
Crack	3	1*	3	1*
Inhalants	3	3	1	2
LSD	1	1	3	1
Other Psychedelics	2	1	2	1
Heroin	1	1	1	0*
Crystal meth	3	1*	6	3*
N	1,112	1,117	816	821

*$p < .05$.

Exposure to anti-drug programs was measured with the item, "Have you ever participated in any of the following drug prevention programs? Mark all that apply," including DARE, Just Say No activity, Red Ribbon Campaign Activities, School education program, and other drug/alcohol prevention program or activity. Items were summed to create a composite of the number of prevention programs participants were exposed to.

Procedure

Prior to survey administration, parents are sent a first class letter describing the survey and indicating that they may remove their child from the project by returning a signed form, calling the school or dropping by the school for notification. In addition to this notification, at least one other announcement regarding the survey is made through an appropriate media outlet in the community where the school is located. Just prior to survey administration, instructions are provided by the classroom teacher including the stipulation that the survey is totally voluntary and that students can refuse to answer any or all of the questions without penalty. The refusal rate, either by parents or students, is generally under 2%. The surveys are anonymous and precautions are taken to make certain that no student's answers can be observed. These procedures, as well as other human subjects issues, have been approved by Colorado State University's Institutional Review Board. Because the survey is anonymous and confidential, the potential risks are seen as relatively low (see Beauvais et al., 2004 for a more complete description of the survey process).

Results

Drug-Use Rates

To determine the overall prevalence of drug use and specific drugs among Oklahoma and non-Oklahoma Indian youth, differences in proportions of students who reported that they

Table 4
Means for family influence variables among non-Oklahoma and Oklahoma students

	7th–9th Graders				
Family care	Non-Oklahoma	Oklahoma	*F*	*p*	R^2
Got drunk	3.62	3.70*	5.236	.022	.00
Smoked marijuana	3.52	3.76*	47.926	<.001	.02
Used other drugs	3.67	3.83*	23.856	<.001	.01
Used inhalants	3.68	3.82*	19.881	<.001	.01
A higher score means greater family caring.					
Family stop	Non-Oklahoma	Oklahoma	*F*	*p*	R^2
Getting drunk	3.69	3.78*	8.688	.003	.00
Using marijuana	3.62	3.85*	58.875	<.001	.03
Using other drugs	3.79	3.92*	26.823	<.001	.01
Using inhalants	3.80	3.90*	14.852	<.001	.01
A higher score means greater pressure to stop.					
	10th–12th Graders				
Family care	Non-Oklahoma	Oklahoma	*F*	*p*	R^2
Got drunk	3.59	3.58	.060	.807	
Smoked marijuana	3.49	3.78*	53.148	<.001	.03
Used other drugs	3.75	3.90*	22.369	<.001	.01
Used inhalants	3.79	3.89*	10.358	.001	.01
A higher score means greater family caring.					
Family stop	Non-Oklahoma	Oklahoma	*F*	*p*	R^2
Getting drunk	3.62	3.64	.187	.666	
Using marijuana	3.54	3.82*	56.882	<.001	.03
Using other drugs	3.81	3.93*	18.346	<.001	.01
Using inhalants	3.84	3.92*	9.874	.002	.01
A higher score means greater pressure to stop.					

Note: $^*p < .05$.

had tried each drug in their lifetime, in the last year, and in the last 30 days were calculated for each drug (see Tables 1–3). The difference in proportion tests for both the 7th–9th grade samples and the 10th–12th grade samples indicated that for most substances, non-Oklahoma students had higher rates of trying drugs on average compared with Oklahoma students for all three prevalence measures. As expected, rates are lower for the younger students. Of particular note is the extremely high level of marijuana use among the non-reservation youth. This has been noted over the years and it appears that marijuana use has become nearly normative in many of these communities (Beauvais et al., 2004).

Comparisons of Predictors of Drug Use

One-way analysis of variance was used with a matched sample of Oklahoma and non-Oklahoma Indian 7th–12th graders to generate the following results. They are reported by two grade levels.

Table 5
Means for peer influence variables among Oklahoma and non-Oklahoma students

	7th–9th Graders				
Peers stop	Non-Oklahoma	Oklahoma	F	p	R^2
Getting drunk	2.40	2.77*	50.019	<.001	.02
Using marijuana	2.37	3.00*	146.142	<.001	.06
Using uppers	3.10	3.34*	22.256	<.001	.01
Using cocaine	3.08	3.40*	53.574	<.001	.02
Sniffing	3.03	3.23*	14.912	<.001	.01
A higher score means greater pressure to stop.					
Peers use	Non-Oklahoma	Oklahoma	F	p	R^2
Get drunk once in a while	2.36	2.00*	75.566	<.001	.03
Get drunk every weekend	2.12	1.68*	91.968	<.001	.04
Use marijuana	2.36	1.68*	298.746	<.001	.12
Use uppers	1.20	1.19	.224	.636	
Use cocaine	1.32	1.18*	33.953	<.001	.02
Sniffing	1.32	1.24*	8.966	.003	.00
A higher score means more friends to use.					
Peers ask	Non-Oklahoma	Oklahoma	F	p	R^2
Get drunk	2.11	1.68*	98.814	<.001	.04
Use marijuana	2.47	1.70*	251.594	<.001	.10
Use uppers	1.21	1.20	.190	.663	.00
Use cocaine	1.30	1.19*	14.118	<.001	.01
Use "sniff"	1.28	1.21*	4.818	.028	.00
A higher score means more friends ask.					
	10th–12th Graders				
Peers stop	Non-Oklahoma	Oklahoma	F	p	R^2
Getting drunk	2.21	2.47*	26.925	<.001	.01
Using marijuana	2.17	2.76*	109.439	<.001	.06
Using uppers	3.10	3.30*	12.962	<.001	.01
Using cocaine	3.07	3.50*	65.538	<.001	.04
Sniffing	3.15	3.42*	25.360	<.001	.02
A higher score means greater pressure to stop.					
Peers use	Non-Oklahoma	Oklahoma	F	p	R^2
Get drunk once in a while	2.70	2.65	.809	.368	
Get drunk every weekend	2.51	2.33*	11.720	.001	.01
Use marijuana	2.64	2.13*	152.765	<.001	.09
Use uppers	1.25	1.33*	8.215	.004	.01
Use cocaine	1.52	1.27*	61.327	<.001	.04
Sniff	1.22	1.22	.003	.958	
A higher score means more friends to use.					

Table 5
Means for peer influence variables among Oklahoma and non-Oklahoma students (Continued)

Peers ask	Non-Oklahoma	Oklahoma	*F*	*p*	R^2
Get drunk	2.56	2.34*	17.974	<.001	.01
Use marijuana	2.80	2.18*	126.351	<.001	.07
Use uppers	1.26	1.30	1.343	.247	
Use cocaine	1.44	1.23*	34.032	<.001	.02
Use "sniff"	1.19	1.21	.232	.630	
A higher score means more friends to ask.					

Note: *p <.05.

Family Influence. This domain consists of the extent to which parents are perceived to care about the youth using drugs and the extent that parents are perceived to try to stop drug use (see Table 4). Among the 7th–9th graders, there were significant differences on all items, such that Oklahoma students reported higher rates of family caring about drug use and family stopping use. The pattern for the 10th–12th graders was similar except there was no difference between the groups on the concern about and willingness to stop getting drunk.

Peer Encouragement. To test differences in the extent to which peers encourage or discourage use of various drugs one-way ANOVAs were conducted on reports of the extent to which peers would *stop* participants from using these drugs, perceptions of the extent to which peers *use* drugs, and the extent to which peers *ask* participants to use these drugs. Each type of peer influence was significantly different between Oklahoma and non-Oklahoma students for most drugs (see Table 5), such that Oklahoma students received less influence from peers to use drugs compared with non-Oklahoma students.

Age of First Use. There were significant differences among Oklahoma and non-Oklahoma students in the average age that they used marijuana and tried inhalants for the first time, such that Oklahoma students tried these substances at a later age compared with non-Oklahoma students (see Table 6 for means and ANOVA statistics). However, there was not a difference between groups in the age students got drunk for the first time.

Perceived Harm. The general trend among the 7th–9th graders was for the Oklahoma youth to have higher levels of perceived harm than the non-Oklahoma youth with four of

Table 6
Mean age of first use among non-Oklahoma and Oklahoma 7th–12th graders

	Non-Oklahoma (248)	Oklahoma (118)	*F*	*p*	R^2
Got drunk	12.16	12.18	.007	.933	.00
Marijuana	11.40	12.21*	10.816	.001	.03
Inhalants	12.17	12.86*	8.008	.005	.02

Note: *p <.05.

Table 7
Mean perceived harm ratings for non-Oklahoma and Oklahoma students

	7th–8th Graders				
	Non-Oklahoma	Oklahoma	*F*	*p*	R^2
Get drunk regularly	3.39	3.71*	75.775	<.001	.04
Use marijuana regularly	3.17	3.61*	67.784	<.001	.03
Use uppers regularly	3.98	4.05	2.462	.177	
Use cocaine regularly	3.86	3.99*	8.193	.004	.00
"Sniff" regularly	3.90	3.99	3.380	.066	
Use LSD regularly	4.02	4.11	3.789	.052	
	10th–12th Graders				
	Non-Oklahoma	Oklahoma	*F*	*p*	R^2
Get drunk regularly	3.62	3.67	1.741	.187	
Use marijuana regularly	3.11	3.35*	15.919	<.001	.01
Use uppers regularly	4.08	3.93*	8.490	.004	.01
Use cocaine regularly	3.92	3.95	.444	.505	
"Sniff" regularly	4.03	3.94	3.545	.060	
Use LSD regularly	4.12	4.04	2.465	.177	

Note. *p <.05. Perceived harm means and analyzes were conducted only on participants who answered 1–4 on the scale for rated harm; participants who rated "don't know" were excluded from the analyzes.

the items achieving significance (see Table 7). This pattern held for the 10th–12th graders for marijuana and uppers but there were no differences for the other drugs asked about.

Perceived Availability. The general trend for most of the drugs asked about, among both age groups, was for greater perceived availability among the Oklahoma students compared with the non-Oklahoma Indian students (see Table 8). The major exception to this was for the non-Oklahoma students to perceive marijuana as being widely available.

Prevention Programs. To compare the perceived prevalence of anti-drug programs, the average number of reported anti-drug programs were compared among Oklahoma and non-Oklahoma students. For both age groups, mean differences reached statistical significance such that Oklahoma students reported a greater number of anti-drug programs compared with non-Oklahoma students. For 7th–9th graders, non-Oklahoma students reported exposure to fewer anti-drug campaigns ($M = 1.12$) compared with Oklahoma students ($M = 1.75$), $F(1,2227) = 122.554$, $MSE = 1.80$, $p < .001$, $R^2 = .05$. For 10th–12th graders, non-Oklahoma students reported exposure to fewer anti-drug campaigns ($M = 1.12$) compared with Oklahoma students ($M = 1.62$), $F(1,1635) = 59.685$, $MSE = 1.77$, $p < .001$, $R^2 = .04$.

Discussion

Oklahoma students reported lower lifetime prevalence of trying most drugs as well as the extent to which students reported using drugs in the last year and the last 30 days compared with reservation Indian students. It is important to note that these differences exist despite a higher level of perceived availability of drugs in Oklahoma (with the exception

Table 8
Mean difficulty differences in difficulty obtaining substances among non-Oklahoma and Oklahoma youth

	7th–8th Graders				
	Non-Oklahoma	Oklahoma	*F*	*p*	R^2
Alcohol	2.50	2.41	1.817	.178	
Marijuana	2.39	2.95*	68.001	<.001	.03
Uppers	3.95	3.68*	19.013	<.001	.01
Inhalants	3.83	3.75	1.693	.193	
LSD	3.07	2.85*	8.358	.004	.00
Other psychedelics	4.02	3.87*	6.539	.011	.00
PCP	4.06	3.87*	11.236	<.001	.01
Heroin	4.08	3.88*	11.305	.001	.01
Other narcotics	4.08	3.87*	12.897	<.001	.01
	4.08	3.80*	21.303	<.001	.01
	10th–12th Graders				
	Non-Oklahoma	Oklahoma	*F*	*p*	R^2
Alcohol	1.79	1.66*	6.259	.012	.00
Marijuana	1.72	1.98*	19.991	>.001	.01
Uppers	3.42	2.94*	43.804	<.001	.03
Inhalants	3.14	3.26	2.827	.093	
LSD	2.40	2.38	.063	.803	
Other psychedelics	3.51	3.43	1.303	.254	
PCP	3.55	3.39*	5.424	.020	.00
Heroin	3.69	3.49*	9.013	.003	.01
Other narcotics	3.78	3.51*	15.811	<.001	.01
	3.59	3.33*	13.309	<.001	.01

Note: A higher score means more difficult to obtain.
*$p < .05$.

of marijuana). In an overall demographic sense, the differences in use levels might be predicted given the findings of Johnston, O'Malley, Bachman, and Schulenberg (2006) that students in the Southeast United States have traditionally shown lower rates of use. Given these differences in use levels, one might also expect differences in predictors of use and, indeed, most drug-use predictors were in the expected direction.

Consistent with Primary Socialization Theory (Oetting and Beauvais, 1987b), Oklahoma youth reported more family pressure to avoid drug use and less peer pressure to use. These two factors are a reflection of a larger social environment that is less tolerant of drugs in Oklahoma than that found for reservation youth. It is quite possible that the relative isolation of reservations may account for a lack of awareness of drug and alcohol problems or that greater poverty on reservations leads to lower social cohesion (Duncan, Duncan, and Stryker, 2002) and the lack of resources for prevention and treatment (as noted

in the lower number of reported drug prevention programs reported by reservation youth). Poverty, per se, might not lead to higher levels of drug use, yet the negative pressure put on social systems might create the conditions for a greater drug use, as predicted by Primary Socialization Theory.

There are other indicators that reflect the differences between Oklahoma Indian youth and reservation youth. Age of the first use of a substance has been consistently shown to predict levels of use, and, the severity of drug-use problems later in life (Hingson, Heeren, and Winter, 2006; Kandel, Yamaguchi, and Chen, 1992). The Oklahoma youth are showing about a 10-month delay in the onset of marijuana use and a 7-month delay in the first use of inhalants. This could have significant effects on patterns later in their lives, and may also have implications for risk for psychotic disorders late in life as well, given recent evidence (see Amar and Potvin, 2007 for a review).

Further evidence that these two groups differ in their attitudes toward drugs is provided by the perceived harm variable. Oklahoma youth perceive drugs as being more harmful. The "perceived harm" variable has been shown to be highly correlated with rates of drug use (Johnston et al., 2006).

The data presented here have implications for reducing the disparities in drug-use behavior found among these two groups of Indian youth. First, reservation communities should expand parental awareness of drug use and parents should be encouraged to become more active in their interactions with their children regarding drugs. Second, youth themselves need more intensive prevention activities with an emphasis on increasing their awareness of the negative effects of drugs (i.e., increase their level of perceived harm) and greater awareness of the influence they have on their peers. It has been noted elsewhere that Indian youth associate more frequently with older siblings and peers and an appeal can be made to these older youth to protect their younger relatives and friends (Beauvais, 2000). Finally, prevention activities for reservation youth must start very early, given the much lower age of the first use noted in these data.

Study's Limitations

Among the possible limitations for this study are the cross-sectional nature of the data and the validity of self-report. Caution naturally needs to be exercised in interpreting causality from correlational data. The confirmation of causality must ultimately come from longitudinal research. The data presented here, however, are highly consistent with theory and are in agreement with the findings in the general literature and at least are suggestive of constructs in need of further investigation. Causality is not an issue with prevalence rates but one might be concerned over the accuracy of self-report. Johnston and colleagues (2006) and Wallace and Bachman (1993) discuss this issue extensively and generally agree that self-report is reasonably reliable and valid in both general and minority populations. One way of improving self-report accuracy of the data presented here is to examine the data for inconsistent and exaggerated responses. Each survey is subjected to checks to detect these types of responses. A student is allowed to fail three of these checks and any survey beyond this criterion is removed from the analyses.

The present research is important for a number of reasons. First, these data provide indirect evidence for Primary Socialization Theory, by showing the correspondence between community efforts at drug-use prevention, parental sanctions, and peer influences, and how these factors can operate to protect against drug use. Second, no previous empirical research has demonstrated this comparison among Oklahoma and non-Oklahoma youth. This is important to show the regional differences that exist among American Indian groups,

especially those that differ in their socioeconomic level, resources, and other demographic variables. Future research is needed to directly test the temporal order among the operation of these variables as proposed in PST, and, consistent with Bronfenbrenner's ecological model (Bronfenbrenner, 1979) to identify and directly measure other regional and broader community-level characteristics to further understand the complex interplay of factors explaining why these differences exist.

Declaration of interest: The authors report no conflict of interest. The authors alone are responsible for the content and writing of this paper.

RESUME

Différences dans les taux d'usage de drogues illicites chez les eunes Amérindiens de l'Oklahoma et d'ailleurs

Les facteurs démographiques peuvent servir de facteurs de risque ou de protection à l'égard de l'usage de drogues dans les collectivités amérindiennes. L'objectif de la présente étude était de comparer les taux d'usage de drogues chez les jeunes Amérindiens de l'Oklahoma et d'ailleurs, et de tester les taux correspondants de facteurs communautaires, familiaux et sociodémographiques préventifs et protecteurs. Les données des participants comprenaient 1928 Amérindiens de la 7^{e} à la 12^{e} année d'écoles hors de l'Oklahoma et 1938 élèves amérindiens d'écoles de l'Oklahoma, cumulatives sur deux ou trois ans tirées d'une étude continue sur la consommation de drogues et la prévention s'y rattachant chez les jeunes Amérindiens. Comme prévu, des essais d'analyse de la variance unilatéraux ont indiqué que les jeunes de l'Oklahoma ont montré des taux inférieurs d'usage de drogues, des âges plus tardifs d'initiation à l'usage de drogues, et des niveaux plus élevés de préjudices perçus liés à l'usage de drogues. Ces différences sont illustrées dans les différences de facteur protecteur prévu, y compris des niveaux supérieurs d'exposition à des campagnes antidrogue dans la collectivité et les écoles, une meilleure participation de la famille dans la prévention liée à l'usage de drogues, et des niveaux inférieurs d'associations avec des pairs qui consomment. La force de ces facteurs protecteurs est illustrée par le fait que les taux d'usage de drogues étaient inférieurs chez les jeunes de l'Oklahoma *malgré* la perception chez les jeunes de l'Oklahoma que les drogues étaient plus faciles à obtenir, comparativement aux jeunes d'ailleurs. Les limites et les suggestions pour la recherche future sont notées.

Mots-clés : consommation de drogues; prévention; jeunes Amérindiens; collectivité; adolescents;

RESUMEN

Diferencias en los índices del consumo de drogas ilegales entre los jóvenes indígenas de Oklahoma y los de otros estados

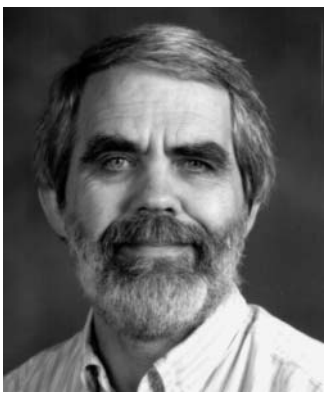
Los factores demográficos pueden servir como factores de riesgo o de protección contra el uso de drogas en comunidades amerindias. El propósito del presente estudio fue comparar los índices en el consumo de drogas entre la juventud indígena de Oklahoma y la de otro estados, con las tasas correspondientes de factores sociodemográficos para prevenir y proteger a la comunidad y a la familia. Los datos de los participantes incluyeron a 1928 estudiantes indígenas del 7∞ al 12∞ grado, de escuelas afuera de Oklahoma y de 1938 estudiantes indígenas de escuelas en Oklahoma, y se sumaron a una encuesta de dos y tres años que a la sazón se realiza sobre el uso de sustancias ilegales y la

prevención entre la juventud amerindia. Como se pronosticara, las pruebas de una entrada de Análisis de Varianza indicaron que la juventud de Oklahoma mostró índices menores de consumo de drogas; inicio a edades más tardías en el consumo de estupefacientes; y una percepción de niveles de mayor daño por el uso de drogas. Estas diferencias se reflejaron en las diferencias del factor de protección pronosticado, incluyendo niveles más elevados de exposición a campañas contra las drogas en la comunidad y las escuelas; mayor participación familiar en la prevención del uso de estupefacientes; y grados menores de asociaciones con drogas entre compañeros de la misma edad. La fuerza de estos factores de protección se ilustran con el hecho de que los índices del uso de drogas son menores entre los jóvenes de Oklahoma *a pesar* de la percepción de que entre la juventud de ese estado había mayor acceso a las drogas en comparación con los jóvenes de otras regiones. Se incluyen las limitaciones y sugerencias para investigaciones futuras.

Palabras clave: uso de sustancias; prevención; juventud amerindia; comunidad; adolescentes.

THE AUTHORS

Sarah Tragesser, PhD, is currently an Assistant Professor in the Department of Psychology, Washington State University. Her research is centered on personality and personality disorder features, cross-cultural research, and emotions, and their associations with substance abuse. Specific research in these areas includes borderline personality disorder features and alcohol problems, drinking motives, substance abuse prevention, and cross-cultural issues of measurement equivalence and bias. She uses a variety of research methods, including ecological momentary assessments and event-based sampling (with palm pilot surveys, acoustic samples), experimental paradigms, vignettes, and longitudinal survey data. Along with colleagues, she conducts research with both normal and clinical populations, with an interest in these issues in the context of normal functioning as well as in the service of alleviating mental health problems and their social consequences.



Frederick Beauvais, PhD, is a Senior Research Scientist with the Tri-ethnic Center for Prevention Research at Colorado State University. Dr. Beauvais holds PhD degree in counseling/clinical psychology. He is Principal Investigator on a project funded by the National Institute on Drug Abuse which examines the trends and patterns of drug use among American Indian adolescents with an emphasis on risk and protective factors and the impact of cultural identification on drug-use patterns. This project has been ongoing since 1974. Dr. Beauvais also participates in a number of other research projects that are concerned with social and psychological problems confronting ethnic minority populations including violence, victimization, delinquency school dropout, and suicide. In addition to his interests in specific research topics, Dr. Beauvais has written extensively on the procedures and ethics

of conducting research among ethnic minority populations with a special interest in the promotion of collaborative research models.

Martha Burnside is a Research Associate at CASAE; the Center for Applied Studies in American Ethnicity at Colorado State University. Martha has worked in Native communities for over 13 years in the fields of substance abuse and treatment as well as HIV/AIDS prevention. Martha serves as the Tribal Liaison/Field Coordinator and also a Community Readiness trainer with the "Advancing HIV/AIDS Prevention in Native Communities: Strengthening Community Access to and Utilization of HIV Prevention Services." This project provides capacity building assistance (CBA) to organizations and tribes serving Native people in an effort to strengthen prevention and intervention efforts and increase early detection for HIV/AIDS infection. This project is funded by the Centers for Disease Control and Prevention. Martha graduated from the Institute of American Indian Arts in Santa Fe, New Mexico, and received her BA from Southeastern Oklahoma State University. Martha is a published poet and an enrolled voting member of the Sac and Fox Nation of Oklahoma.

Pamela Jumper Thurman, PhD, Western Cherokee, is a Senior Research Scientist with the Department of Ethnic Studies at Colorado State University. She has worked with cultural issues utilizing community participatory research, prevention of ATOD, methamphetamine treatment and prevention, prevention of violence and victimization, rural women's concerns, HIV/AIDS, and solvent abuse, and currently serves or has served as principal investigator or co-principal investigator for federally funded grants that examine community/grassroots prevention of intimate partner violence, state wide initiatives to prevent methamphetamine use, epidemiology of American Indian substance use, prevention of HIV/AIDS, and epidemiology and prevention of solvent use among youth.

References

Amar, M. B., Potvin, S. (2007). Cannabis and psychosis: what is the link? *Journal of Psychoactive Drugs*, 39(2):131–142.

Argawal, A., Lynskey, M. T., Bucholz, K. K., Madden, P. A., Heath, A. C. (2007). Correlates of cannabis initiation in a longitudinal sample of young women: the importance of peer influences. *Preventive Medicine: An International Journal Devoted to Practice and Theory*, 45(1):31–34.

Ary, D. V., Tildesley, E., Hops, H., Andrews, J. (1993). The influence of parent, sibling, and peer modeling and attitudes on adolescent use of alcohol. *The International Journal of the Addictions*, 28:853–880.

Battistich, V., Hom, A. (1997). The relationship between students' sense of their school as a community and their involvement in problem behaviors. *American Journal of Public Health*, 87(12):1997–2001.

Beauvais, F. (2000). Indian adolescence: opportunity and challenge. In R. Montemayor, G. R. Adams, & T. P. Gullotta (Eds.), *Adolescent diversity in ethnic, economic, and cultural contexts* (pp. 110–140). Thousand Oaks, CA: Sage Publications.

Beauvais, F., Chavez, E., Oetting, E. R., Deffenbacher, J., Cornell, G. R. (1996). Drug use, violence, and victimization among White American, Mexican American, and American Indian dropouts, students with academic problems, and students in good academic standing. *Journal of Counseling Psychology*, 43(3):292–299.

Beauvais, F., Jumper-Thurman, P., Helm, H., Plested, B., Burnside, M. (2004). Surveillance of drug use among American Indian adolescents: patterns over 25 years. *Journal of Adolescent Health*, 34:493–500.

Beauvais, F., LaBoueff, S. (1985). Drug and alcohol abuse intervention in American Indian communities. *The International Journal of the Addictions*, 20(1):139–171.

Beauvais, F., Wayman, J. C., Jumper-Thurman, P., Plested, B., Helm, H. (2002). Inhalant abuse among American Indian, Mexican American, and non-Latino White adolescents. *American Journal of Drug and Alcohol Abuse*, 28(1):171–187.

Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.

Chavez, E. L., Deffenbacher, J. L., Wayman, J. C. (1996). A longitudinal study of drug involvement in Mexican American and White Non-Hispanic High School dropouts, academically at risk students, and control students. *Free Inquiry for Creative Sociology*, 24(2):185–193.

D'Amico, E. J., McCarthy, D. M. (2006). Escalation and initiation of younger adolescents' substance use: the impact of perceived peer use. *Journal of Adolescent Health*, 39:481–487.

Dick, D. M., Rose, R. J., Viken, R. J., Kaprio, J., Koskenvuo, M. (2001). Exploring gene–environment interactions: socioregional moderation of alcohol use. *Journal of Abnormal Psychology*, 110(4):625–632.

Dick, D. M., Viken, R., Purcell, S., Kaprio, J., Pulkkinen, L., Rose, R. J. (2007). Parental monitoring moderates the importance of genetic and environmental influences on adolescent smoking. *Journal of Abnormal Psychology*, 116:213–218.

Duncan, S., Duncan, T., Stryker, L. (2002). A multilevel analysis of neighborhood context and you alcohol and drug problems. *Prevention Science*, 3(2):125–133.

Graham, J. W., Marks, G., Hansen, W. B. (1991). Social influence processes affecting adolescent substance use. *Journal of Applied Psychology*, 76:291–298.

Guo, J., Hill, K. G., Hawkins, J. D., Catalano, R. F., & Abbott, R. D. (2002). A developmental analysis of sociodemographic, family and peer effects on adolescent illicit drug initiation. *Journal of the American Academy of Child & Adolescent Psychiatry*, 41(7):838–845.

Hawkins, J. D., Catalano, R. F., Miller, J. M. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychological Bulletin*, 112:64–105.

Hawkins, J. D., Lishner, D. M., Catalano, R. F., Howard, M. O. (1985). Childhood predictors of adolescent substance abuse: toward an empirically grounded theory. *Journal of Children in a Contemporary Society*, 18(1–2):11–48.

Hingson, R., Heeren, T., Winter, M. (2006). Age at drinking onset and alcohol dependence: age at onset duration and severity. *Archives of Pediatric and Adolescent Medicine*, 160:739–746.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E. (2004). *Monitoring the future national survey results on drug use, 1975–2003. Volume I: Secondary school students* (NIH Publication No. 04-5507). Bethesda, MD: National Institute on Drug Abuse, 545.

Kandel, D. (1985). On process of peer influences in adolescent drug use: a developmental perspective. *Alcohol and Substance Abuse in Adolescence*, 3(4):139–163.

Kandel, D., Yamaguchi, K., Chen, K. (1992). Stages of progression in drug involvement from adolescence to adulthood: further evidence for the gateway theory. *Journal of Studies on Alcohol*, 53:447–457.

Kobus, K. (2003). Peers and adolescent smoking. *Addiction*, 98(Suppl. 1):37–55.

Mason, W. A., Kosterman, R., Hawkins, J. D., Haggerty, K. P., Spoth, R. L. (2003). Reducing adolescents' growth in substance use and delinquency: randomized trial effects of a parent-training prevention intervention. *Prevention Science*, 4(3):203–212.

Napoli, M., Marsiglia, F. F., Kulis, S. (2003). Sense of belonging in school as a protective factor against drug abuse among Native American urban adolescents. *Journal of Social Work Practice in the Addictions*, 3(2):25–41.

Oetting, E. R., Beauvais, F. (1987a). Common elements in youth drug abuse: peer clusters and other psychosocial factors. *Journal of Drug Issues*, 17(1–2):133–151.

Oetting, E. R., Beauvais, F. (1987b). Peer cluster theory, socialization characteristics, and adolescent drug use: a path analysis. *Journal of Counseling Psychology*, 34(2):205–213.

Oetting, E. R., Beauvais, F. (1990). Adolescent drug use: findings of national and local surveys. *Journal of Consulting and Clinical Psychology*, 58(4):385–394.

Oetting, E. R., Beauvais, F., Edwards, R. (1989). Alcohol and Indian youth: social and psychological correlates and prevention. In R. Wright, Jr. & T. D. Watts (Eds.), *Alcohol problems of minority youth in America* (pp. 143–163). Interdisciplinary studies in alcohol use and abuse (Vol. 2). Lewiston, NY: The Edwin Mellon Press.

Oetting, E. R., Donnermeyer, J. F. (1998). Primary socialization theory: the etiology of drug use and deviance. I. *Substance Use & Misuse*, 33(4):995–1026.

Oetting, E. R., Donnermeyer, J. F., Deffenbacher, J. L. (1998). Primary socialization theory: the influence of the community on drug use and deviance. III. *Substance Use & Misuse*, 33(8):1629–1665.

Oetting, E. R., Swaim, R. C., Edwards, R. W., Beauvais, F. (1989). Indian and Anglo adolescent alcohol use and emotional distress: path models. *American Journal of Drug and Alcohol Abuse*, 15(2):153–172.

Resnick, M. D., Bearman, P. S., Blum, R. W., Bauman, K. E., Harris, K. M., Jones, J., et al. (1997). Protecting adolescents from harm: findings from the National Longitudinal Study on Adolescent Health. *Journal of the American Medical Association*, 278(10):823–832.

Sale, E., Sambrano, S., Springer, J. F., Pena, C., Pan, W., Kasim, R. (2005). Family protection and prevention of alcohol use among Hispanic youth at high risk. *American Journal of Community Psychology*, 36(3–4):195–205.

Simons-Morton, B., Chen, R. (2005). Latent growth curve analyses of parent influences on drinking progression among early adolescents. *Journal of Studies on Alcohol*, 66(1):5–13.

Swaim, R. C., Bates, S. C., Chavez, E. L. (1998). Structural equation socialization model of substance use among Mexican-American and White non-Hispanic school dropouts. *Journal of Adolescent Health*, 23:128–138.

Velleman, R. D. B., Templeton, L. J., Copello, A. G. (2005). The role of the family in preventing and intervening with substance use and misuse: a comprehensive review of family interventions, with a focus on young people. *Drug and Alcohol Review*, 24(2):93–109.

Wallace, J., Bachman, J. (1993). Validity of self-reports in student-based studies on minority populations: issues and concerns. In M. De La Rosa & J. Adrados (Eds.), *Drug abuse among minority youth: advances in research methodology* (NIDA Research Monograph 130). Washington, D.C.: National Institute on Drug Abuse, US Department of Health and Human Services.

Weinberg, N. Z., Rahdert, E., Colliver, J. D., Glantz, M. D. (1998). Adolescent substance abuse: a review of the past 10 years. *Journal of the American Academy of Child & Adolescent Psychiatry*, 37(3):252–261.

Younge, S. L., Oetting, E. R., & Deffenbachen, J. L. (1996). Correlations among maternal rejection, dropping out of school, and drug use in adolescents. *Journal of Clinical Psychiatry*, 52(1):96–102.

Yu, M., Stiffman, A. R. (2007). Culture and environment as predictors of alcohol abuse/dependence symptoms in American Indian youths. *Addictive Behaviors*, 32:2253–2259.