Published in final edited form as:

Int J Law Crime Justice. 2015 June 1; 43(2): 252–272. doi:10.1016/j.ijlcrj.2014.09.003.

Factors Associated With American Indian and White Adolescent Drug Selling in Rural Communities

David Eitle^a and Tamela McNulty Eitle^a

^aDepartment of Sociology & Anthropology, Montana State University, Bozeman, MT, USA

Abstract

Relatively few studies have examined the correlates of adolescent drug selling in America, with most of these studies focusing on urban settings. The present study examines the risk and protective factors associated with drug selling among American Indian and white adolescents residing in a rural Northwestern state in the United States. Using survey data collected in 2010–2012, we conduct logistic regression analyses exploring the correlates of drug selling ($n=568$). Generally, we found support for prior explanations of drug selling, but identified some important race-specific differences. Specifically, we found that stress exposure was a risk factor for American Indians, but not whites. Conversely, academic achievement served as a protective factor for white adolescents but not American Indians. Our findings suggest that the race gap in rural drug selling can be explained by considering differences in social bonds, stress exposure, and exposure to substance using family and friends.

Keywords

American Indians; rural communities; drug selling

1. Introduction

Prior research has established that American Indian (AI) adolescents are disproportionately at risk for various substance use behaviors, relative to the general population (e.g., Plunkett & Mitchell, 2000; Office of Applied Studies, 2007; Beauvais et al., 2008; Wood, 2009).

While a number of studies have revealed that American Indian adolescents are at a heightened risk of earlier onset of substance use, drug use beyond marijuana, and alcohol/substance abuse/dependence (Costello, Farmer, Angold, Burns, & Erkanli, 1997; Plunkett & Mitchell, 2000; Office of Applied Studies, 2007), there has been little empirical research that has explored the risk and protective factors associated with drug selling among AI adolescents. Indeed, there have been relatively few studies that have examined the factors that are associated with drug selling among adolescents that reside in rural America

Direct correspondence to: David Eitle, Professor and Department Head, Department of Sociology & Anthropology, Wilson 2-130, P.O. Box 172380, Bozeman, MT 59717, USA. (406) 994-5253. deitle@montana.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

generally. Rural communities, particularly those in sparsely populated and geographically isolated areas, may offer smaller markets but also less competition than urban communities (Steinman, 2005; Frith & McElwee, 2007). The social and economic consequences of drug selling include not only the productivity and health costs of drug use, but also the social cost to communities of having increased numbers of residents in prison and under criminal justice supervision (Rhodes, 2009). These costs may be particularly devastating in minority communities where arrest for drug use or selling, often the arrest of young adult males, are more common (Iguchi, 2002; Sanders, Deeds, & Thomas, 2013). Our research questions are derived from three explanations of drug selling proposed by Steinman (2005), social bonding, social networks supporting drug use, and purposeful business activity and an exposure to stress explanation derived from Agnew's (1992) general strain theory. We explore whether social bonds to parents and school, substance using family and peers, and stress affect adolescent drug selling. We also explore whether there are racial differences in the association between these factors and drug selling. In this study, we extend prior research into the correlates of drug selling by using data collected from a study of rural non-Hispanic and AI youth in a rural Northwestern state in the United States. In order to properly situate our research, we first examine the key explanations and the correlates of adolescent drug selling, as well as the cumulative evidence supporting such explanations/correlates. Since most of this research has been conducted in urban settings, we examine the rural setting for drug selling. Finally, we explore the problem of drugs among AIs, and discuss the reasons why exploring the correlates of AI drug selling and the race gap between white and AI teen drug selling is important.

1.1. Background

While the problem of adolescent illicit drug use/misuse/abuse has produced voluminous research exploring virtually every aspect surrounding the phenomenon, the risk and protective factors associated with adolescents who sell illicit drugs have been relatively understudied. Indeed, some have characterized the problem of adolescent drug dealing as “practically ignored” by scholars (Centers & Weist, 1998; pg. 396). While this may be an overstatement, we found few studies that have explored the antecedents of adolescent drug selling. The extant studies have been illuminating in identifying some of the important correlates of drug dealing, however. One such correlate is drug use—a number of studies have found that drug use is a significant predictor of drug selling (e.g., Inciardi, 1990; Li & Feigelman, 1994; Schensul et al., 1998; Steinman, 2005; Felson et al., 2012). In fact, since selling drugs is so strongly correlated with drug use, many of the risk and protective factors associated with use are also presumed to be predictive of selling.

Beyond drug use, there are other factors that have been identified as correlates of drug selling. Steinman (2005) suggests three key explanations for explaining adolescent drug selling: social bonding, social networks supporting drug use, and purposeful business activity (p. 71.e2). *Social bonding* explanations focus on the role that integration, commitment, and attachment to conventional actors and institutions play in reducing self-serving behaviors. Youth who lack strong attachments to parents and/or lack a strong commitment to schooling are less likely to have a “stake in conformity” (Hirschi, 1969) and hence, may feel that they have less to lose if they engage in deviant behaviors, including

drug selling activities (Steinman, 2005). *Social networks supporting drug use* is an extension of social learning explanations of deviant behavior. Steinman (2005; pg. 71e2) notes that exposure to peers, parents and siblings who use drugs not only promote drug use among adolescents, but may also promote drug selling (see also Flom et al., 2001). *Purposeful business activity* simply connotes that adolescents in financially distressed circumstances, either at the family and/or community level, may be attracted to drug selling as a substitute for legitimate employment. Frith and McElwee (2007) suggest that illegal business activity among young adults may be entrepreneurial and driven by financial need, opportunity, and perception of risk, not merely some individual propensity for risk taking. Other scholars argue that drug dealing provides both easy access to drugs and additional income to feed their own drug habits (Reuter, MacCoun, & Murphy, 1990; Arkes, 2011). As Steinman (2005) suggests, the three explanations are not mutually exclusive but can be nonetheless useful in guiding an exploration of risk and protective factors associated with drug selling.

In our study, we propose to explore Steinman's three different explanations and an additional *stress exposure* explanation beyond the financial need highlighted in Steinman's purposeful business activity explanation. The rationale behind Steinman's purposeful business activity explanation is that some youth logically gravitate to drug selling because of financial need; we suggest that financial need may also be understood as a form of stress, and that this form of stress along with other stressors (stressful events), may be associated with drug selling. According to Agnew's General Strain Theory (1992), negative relations and negative experiences produce strain that must somehow be managed by the individual. Agnew (1992) argues that experiencing such strains produces a range of negative emotions, including anger, frustration, depression, and/or anxiety, that the actor must somehow manage or deal with. Coping with negative emotions includes engaging in crime and deviance (including instrumental behaviors such as drug selling if the person needs income), especially if the person has yet to develop effective coping mechanisms that allow the person to manage the stress (and the corresponding negative emotions) through legitimate actions. Young people faced with financial strains may sell drugs to make money, but other stressors may create emotions in young people that they attempt to resolve by using drugs (i.e., self-medicating; See Hoffman and Su, 1998). Hence, the connection between stress exposure and drug selling may be due to the costs of self-use of drugs (and the need to pay for one's own drugs).

Research that explores the correlates of adolescent drug selling, provides some support for each of these explanations. For instance, various measures of school bonding, including poor academic performance (Uribe & Ostrov, 1989; Black & Ricardo, 1994) and school failure/dropping out (Dembo et al., 1993; Black & Ricardo, 1994), have been found to be predictive of drug selling. Other measures of social bonds, including parental monitoring (Chaiken, 2000; Li, Stanton, and Feigelman, 2000; Little & Steinberg, 2006;) and poor parental communication (Black & Ricardo, 1994), have also been found to be associated with drug selling. In support of the social networks/social-learning thesis, peer influence (Altschuler & Brounstein, 1991; Li et al., 1996; Little & Steinberg, 2006) as well as parental substance use and abuse (Altschuler & Brounstein, 1991; Little & Steinberg, 2006) have been found to be predictive of drug selling. In addition, socioeconomic deprivation has been found in some studies to be a risk factor for drug selling, especially among black youth (Whitehead,

Peterson, & Kaljee, 1994; Centers & Weist, 1998); however, other studies have failed to find an association (Friedman et al., 2003; Floyd et al., 2010). Similarly, Felson and colleagues find that financial stress was a risk factor for drug dealing while being employed reduced the risk of selling drugs (2012; see also Bellair & McNulty, 2009). There is also some evidence supportive of an association between structural economic conditions, such as a recession or economic decline, and an increase in drug use and selling (Altschuler & Brounstein, 1991; Levitt & Lochner, 2001; Mocan & Rees, 2005; Arkes, 2007; 2011). Finally, while there exists few studies that have directly examined the association between stress exposure and drug selling specifically, a number of studies find a link between stress exposure and nonviolent crime indices, that include drug selling; as an example, Slocum, Simpson, and Smith (2005) find a composite measure of stress (strain) is a significant predictor of their measure of nonviolent offending. Indeed, they report that among the items that comprise their crime index, drug selling was the most frequently mentioned behavior.

In addition to the evidence supporting social bonding, social network/social learning and stress exposure theses, other correlates of drug selling have been identified by prior scholarship (Altschuler & Brounstein, 1991; Van Kammen & Loeber, 1994; Steinman, 2005;). One such factor is violent behavior. Violent activity has long been presumed to be a predictor of drug selling, because both are assumed to be the product of shared antecedents of deviant behavior generally (e.g., Jessor & Jessor, 1977) as well as being an instrument used by drug sellers to protect the activity itself. A number of studies provide support for the notion that violence (Adler, 1985; Fagin & Chin, 1990; Johnson et al., 1990; Altschuler & Brounstein, 1991; Dembo et al., 1993; Steinman, 2005) as well as weapon carrying (Li & Feigelman, 1994) are associated with drug selling. Other correlates that have been identified include gender (e.g., Stanton & Galbraith, 1994; Steinman, 2005), family structure (e.g., Van Kammen & Loeber, 1994; Steinman, 2005), parental education (e.g., Van Kammen & Loeber, 1994), perceived availability of drugs (e.g., Floyd et al., 2010), sexual activity (e.g., Li & Feigelman, 1994) and participation in other delinquent activities (e.g., Altschuler & Brounstein, 1991; Li & Feigelman, 1994). Overall, the portrait painted from these studies supports the assertion that many of the predictors of drug selling are the same as the correlates of drug use.

One possible correlate that is germane to our study is the race/ethnicity of the drug seller. Despite media representations of drug sellers as racial minorities (Boyd, 2002; 2007), the evidence regarding the association between race and drug selling is mixed, with some studies finding evidence of race differences in selling (Maryland State Department of Education, 1992; Steinman, 2005), while others have failed to find race differences (Floyd et al., 2010). Further complicating matters is the fact that arrest and incarceration data display an overrepresentation of racial and ethnic minorities for drug dealing offenses (Brownsberger, 2000), although there is significant evidence that such disparities are due more to enforcement patterns and differences in the nature of drug offenses for racial and ethnic minorities rather than racial differences in actual offending (e.g., Tonry, 1995; Gabbidon & Greene, 2013). We are aware of no prior study that has either identified or explored a possible race disparity in drug selling between white and AI adolescents.

1.2 Rural Drug Selling

While the aforementioned research has advanced our knowledge of the antecedents of drug selling, there are still some important limitations that need to be addressed. First and probably most importantly, virtually all prior research that has explored adolescent drug selling has been limited to urban areas—there is a dearth of studies that have explored whether risk and protective factors associated with urban drug dealing applies to the rural scene. Weisheit (1993) argues that this neglect is part of a larger issue of limited scholarship into rural drug issues generally, partly because of what he describes as “urban ethnocentrism” among researchers, the media, and federal enforcement agencies (pg 217; see also Herz, 2000).¹ This is despite the fact that rural areas are known to be key to the domestic marijuana industry, the production of synthetic drugs (such as methamphetamine), and the movement of imported illicit drugs (Weingarten & Coats, 1989; Weisheit, 1993). Notwithstanding these rural sources of serious problems, we know very little about the individual correlates of adolescent drug selling in rural areas.

Perhaps such individual level correlates are similar for rural and urban adolescents, but there exists evidence that the rural drug context (in which selling takes place) may differ substantially from the oft-studied urban context. For instance, O'Dea and colleagues (1997) notes that many urban drug dealers relocated to rural areas for various reasons, including decreased competition, the exploitation of new markets, and less vigorous policing. McElwee, Smith, and Somerville (2011) conceptualize the adult illegal rural enterprise as entrepreneurial and enterprising as well as opportunistic. Additionally, there exists some evidence that contrary to the dominance of street gangs as the primary distributors in urban areas, local law enforcement officers have reported that the primary drug seller in rural areas is the local independent dealer (National Drug Intelligence Center, 2001). As Weisheit and Donnermeyer (2000) suggest, there has been much less research overall into rural drug selling than there has been explorations of rural drug use (see also Hunt & Furst, 2006).

1.3. American Indian Youth, Drug Use and Drug Selling

A well-established finding in the substance use literature is that AI adolescents have the highest rates of illicit drug use and abuse, relative to other racial and ethnic groups in the United States, with marijuana being the most frequently used drug by American Indians (SAMHSA, 2005; Young & Joe, 2009). AI teens have an earlier onset of substance use, are more likely to use “hard” drugs beyond marijuana, and are more likely to use combinations of substances (and alcohol) than white, non-Hispanic teens (Oetting & Beauvais, 1990; Beauvais, 1992, 1996; Costello, Farmer, Angold, Burns, & Erkanli, 1997; Plunkett & Mitchell, 2000). National studies suggest that Native Americans have the highest usage rates of methamphetamines (Iritani, Hallfors, & Bauer, 2007; Oetting et al., 2000) with results from one national survey (National Longitudinal Survey of Adolescent Health) finding that AI youth have a substantially (i.e., 4.2 odds ratio) heightened risk of past year methamphetamine use relative to non-Hispanic whites (Iritani, Hallfors, & Bauer, 2007). Furthermore, Native American teens appear to be at greater risk of substance use and abuse regardless of whether they live on or off of reservations (U.S. Senate Select Committee on

¹For a comprehensive review of research examining rural drug behaviors, see Hunt and Furst (2006).

Indian Affairs, 1985). In his study of AIs and indigenous persons living in the upper Midwest and Canada, Whitbeck and his colleagues (2008) find that the lifetime rates of substance use disorder among their study's respondents were three times higher than substance use disorders reported in a national sample. Indeed, the U.S. Indian Health Service has long identified substance abuse among AIs as their number one health problem (Herring, 1994; as cited in Morris, Wood, & Dunaway, 2006; pg. 579).

Despite this compelling evidence that AI adolescent drug use is a major social problem, we know very little about how AI youth obtain drugs or the correlates of drug selling for AIs. Indeed, we are aware of no published study that has explored the risk and protective correlates of drug selling among American Indians. This is an important omission. First, prior research suggests that drug selling facilitates the problems of substance use/abuse/dependence (Dembo et al., 1990; Black & Ricardo, 1994). Second, prior studies have found that youth who sell drugs are at a heightened risk of other problem behaviors, including property and violent crime, substance use behaviors, truancy and poor school performance, and risky sexual practices, although the causal direction of these associations is not clear (e.g., Bush & Ianotti, 1993; Dembo et al., 1993; Li & Feigelman, 1994). Given that AI adolescents are at a heightened risk of each of these problem behaviors (e.g., see Greenfield & Smith, 1999; Mitchell et al., 2002; Pridemore, 2004; Perry, 2004; Dennis, 2009), research into the correlates of AI drug selling is clearly warranted as an important step in attempting to assuage some of these dire problems.

Further, there is some evidence to suggest that drug selling is a particularly acute problem for rural American Indians (beyond the obvious implication drawn from AI illicit drug use rates being the highest among any racial/ethnic group). Wood (2009) writes that resource limitations, coupled with jurisdictional issues, might have created an environment in which drug law enforcement on American Indian reservations "may not be on par with that found in most other locations" (pg. 69). Hence, there may be unique opportunities to sell drugs for rural AI teens that urban youth may not encounter.

Overall, there are both compelling reasons for exploring the correlates of AI drug selling as well as some evidence suggestive that the rural context in which such drug selling takes place may differ from drug dealing in urban areas. But we are also motivated by the warning of Cernkovich, Giordano, and Rudolph (2000), who suggest that researchers need be wary of generalizations about the processes that lead to deviant behavior across racial groups without directly examining the possible role that race plays in such processes. In short, the present study represents the initial effort to examine whether our extant knowledge about the correlates of drug selling, drawn almost entirely from urban settings, is applicable to a rural setting and can explain any possible race gap (between AIs and whites) in such behavior. Our work is guided by Steinman's (2005) identification of the three major explanations of drug selling, we examine the following hypotheses:

H₁: Adolescents with weaker social bonds to parents and school will be at greater risk to sell drugs than others

H₂: Adolescents exposed to substance using parents and peers will be at greater risk to sell drugs than others

H₃: Adolescents exposed to more stressors will be at greater risk to sell drugs than others

H₄: Race differences in the likelihood of selling drugs will be explained by considering differences in social bonds, exposure to substance using parents and peers, and exposure to stressors.

2. Data and Methods

The rural teen stress and health study data were collected in 2010-2012 as part of an National Institute on Drug Abuse (NIDA) funded project examining adolescent health disparities in a rural state in the northwestern United States. One of the goals of the study was to provide data on adolescent methamphetamine use in isolated rural communities in a state where adult methamphetamine use was well documented. We targeted rural school districts based on high school size and racial/ethnic composition. Our final study included 568 students in five rural schools. Two of the participating schools had less than ten percent non-white enrollment, one school was racially mixed with greater than 30 percent non-white enrollment, and two schools had over 90 percent non-white student enrollment.²

The Montana State University Institutional Review Board approved all data collection procedures. Superintendents of the selected school districts were sent a letter of introduction to the study and informed that one of the principal investigators would contact them by phone. Once superintendents had approved the study, the principals of the high schools were contacted for their approval. Each principal assigned a staff member (secretary, counselor, or school nurse) to help the research team randomly select classes for inclusion in the study (in the two smaller schools all the students were invited to participate). The staff members also distributed and collected parental consent forms for student's volunteering to participate in the study. The principal investigators traveled to each school site and personally administered the surveys to participating students in a classroom that was vacant, an auditorium, or a gymnasium. Data collection was designed to protect students' privacy by allowing for confidential and voluntary student participation. Students completed the paper and pencil self-administered questionnaire in anywhere from 20-50 minutes. Each student who turned in a survey (whether or not they completed it) received a \$10 gift certificate for his or her participation in the study. Data collection was done at the convenience of the participating schools between Fall 2010 and Spring 2012. Response rates varied across the five participating schools ranging from 23 to 44 percent with an overall response rate of 40 percent. The final sample included 612 respondents (72.4 percent non-Hispanic white, 20.4 percent American Indian, and 7.2 percent other racial/ethnic groups). Participant age ranged from 12 to 19 years of age. The majority of students were in high school (95.3%) at the time of the interview, although a small number were in junior high school, due to two participating schools including 7-12th graders. In the present analyses, only non-Hispanic white and American Indian respondents were included, producing a final sample size of 568 students. The unit of analysis for our study was the individual.

---

²Due to the rural nature of the state, information regarding whether the school district served reservation or non-reservation American Indian students cannot be revealed (under the promise of confidentiality). All selected schools were public school districts.

We imputed a set of values for missing data using a model-based multiple imputation method available in Stata 11. Such a procedure is more appropriate than ad-hoc missing data approaches such as complete case analysis because such an approach tends to yield biased results (e.g., underestimation of the variance of the estimates and significance tests that are too optimistic) and are inefficient because of the reduced sample size due to removal of cases with missing data (He et al., 2010). This imputation method obtains imputations by simulating from a Bayesian posterior predictive distribution of the missing data (or its approximation) under the conventional chosen distribution (StataCorp, 2009 : pg. 8). The three basic steps to this multiple imputation method are: 1) the imputation step, where a number of imputed data sets are generated; 2) the estimation/analysis step, where the desired analysis is completed on each of the imputed data sets; and 3) the pooling step, where the results from each of the analyses are combined into a single multiple-imputation result (StataCorp, 2009). We imputed five (5) completed datasets.

2.1. Measures

Our dependent variable, *drug selling*, was captured by summing the responses to a series of questions asking the respondent if they have sold the following drugs in the past year: methamphetamine, heroin, marijuana, cocaine/crack, and prescription drugs ('for fun, not as a doctor instructed'). Because of the highly skewed nature of the responses, we created a simple dichotomous measure, indicating whether or not the respondent sold any of the aforementioned drugs in the past year. Because the dependent variable is a binary outcome, we utilize logistic regression models to analyze the correlates of drug selling.

Consistent with prior research exploring the correlates of adolescent drug selling, and Steinman's (2005) aforementioned three explanations for explaining adolescent drug selling, we included measures representing each of these explanations: social bonds, financial and other stress, and exposure to substance users. To assess the importance of social bonding as an explanation, we included two measures—parental bonding and academic achievement. *Parental bonding* was comprised of 11 items (6-bonding to mother; 5-bonding to father) borrowed from the warmth dimension of Parker, Tupling, and Brown's (1979) parental bonding instrument. In order to account for single parent families, mother and father specific responses were summed (for each parent), standardized, and then averaged across the two parents to produce the measure; for respondents residing with a single parent, only that gender-specific scale is utilized. Higher scores indicate that the respondent reported having parents who enjoy talking with them, are emotionally close, and seem empathetic (Cronbach's alpha for the subscales: .92 for the mother-scale; .91 for the father scale). *Academic achievement* was a single item asking respondents to report their grades in school during the last grading period. Responses ranged from "all As or mostly As" to "Ds and Fs" with higher scores indicated greater achievement. Academic achievement has been used in other drug selling studies as a measure of a student's bonds to school (e.g., Steinman, 2005; Schensul, 2005).

We included three measures capturing stressors—exposure to recent life events, parental employment, and family financial situation. Consistent with prior research, we created an additive measure of *recent life events* composed of 26 items capturing adverse experiences

reported by the respondent to have occurred in the past year. These events are typical of those included in a variety of other event checklists (e.g., Avison and Turner, 1988; Turner et al., 1995; Turner and Gil, 2002). Multiple occurrences of the same event are not included in the count. Although past studies of adolescent drug selling have not included such inventories of stressful events, we include this measure because prior research has found stressor inventories to be robust predictors of substance use behaviors generally (e.g., Windle, 1992; Hoffman & Su, 1998; Turner & Lloyd, 2003), and because many of the events captured by the checklist would create greater financial difficulties/challenges for the family. *Parental employment* was a simple dichotomous measure asking if (at least) one parent is employed full-time (i.e., 35 hours or greater a week). And *family financial situation* was captured by a single item measure asking the respondent if their family “often struggles to pay for food, clothing, and housing.”

We also included two measures of exposure to substance users, in order to capture both socialization influences and opportunity. *Family substance use* was based on items asking the respondent if she/he is aware of any family member living in your home using any of the following drugs (in the past year): methamphetamine, heroin, marijuana, cocaine/crack, prescription drugs, inhalents (inhaling of household and/or industrial chemicals to get high) and/or alcohol (Cronbach's $\alpha=.62$). *Peer substance use* was a count measure based on how many of the drugs/alcohol types the respondent reported that their close friends used in the past year: methamphetamine, heroin, marijuana, cocaine/crack, prescription drugs, alcohol, or inhalents (Cronbach's $\alpha=.74$).

We also included two important measures of analogous activity that has been found to be associated with adolescent drug selling—general delinquency and respondent substance use. Our measure of delinquency was comprised of ten items asking the respondent if she/he had engaged in any of the following behaviors in the past year: a) been a member of a gang; b) taken money or things from a person by force or by using a weapon; c) snatched someone's stuff without the person knowing it; d) broken into a house, store, or building; e) damaged or destroyed property on purpose that did not belong to you; f) taken a car for a ride without the owner's permission; g) taken more than \$20 from a family member; h) got in a fist fight with someone; i) pulled a weapon on someone; and j) taken something of value from someone else in order to buy drugs. Greater values on this measure indicate greater involvement in delinquent behavior (Cronbach's $\alpha=.71$). *Substance use* was a count of the number of different substances the respondent reported using during the past year, including methamphetamine, heroin, marijuana, cocaine/crack, prescription drugs, or inhalents (Cronbach's $\alpha=.60$).

Additional measures—We included a number of demographic measures in the analyses, including *gender* (female coded 0), *race* (American Indian coded 1), *age*, and a dichotomous measure of *family structure*, based on the respondents' reports of whether they resided with both of their natural parents (coded 1) or not. Appendix A describes select measures used in the analyses.

Informed by theoretical explanations of potential factors that have been proffered to explain drug selling, we entered each group of variables (social bonding, family financial and other

stressors, and deviant behavior) into the model separately and then included measures for all explanations simultaneously in the full model.

3. Results

Table 1 presents the descriptive characteristics for both the American Indian and non-Hispanic white adolescents in the study. As one can adduce from this table, there were a number of statistically significant ($p < .05$) racial differences in the various measures, including drug selling, with AIs reporting a greater involvement than non-Hispanic whites (20% versus 8.8% of each group). We also broke out marijuana and prescription drug selling from the other illicit substances and found that the race differences still persist. AIs reported a higher likelihood of residing in a non-two parent family household, and reported significant differences in a number of key predictor variables. American Indian respondents had a greater average exposure to recent life events (3.58 to 2.59) and almost twice the percentage of AI respondents reported struggling to pay for basic needs (.146 to .078). Likewise, AI respondents, on average, reported lower academic achievement (in the form of school grades). AIs had higher averages on the two measures of exposure to substance users—family and peer substance use. Finally, AIs were also, on average, more heavily involved in both general delinquency and substance use behaviors than non-Hispanic whites. Overall, these results suggested racial differences in the experiences of AIs and whites that are consistent with Steinman's (2005) summary of the explanations associated with drug selling—AIs were more likely to experience the risk factors associated with drug selling.

Table 2 presents the logistic regression results of past year drug selling (odds ratios are reported in the table). In the baseline model, only the demographic variables were included. Each measure was found to be a statistically significant predictor of drug selling—males, older respondents, and residing in a non-two parent family. American Indian respondents were at increased odds of being involved in drug selling, with an adjusted odds ratio of 2.22. The consideration of the explanatory variables representing social bonding, family stressors, and exposure to substance users, revealed substantial support for each of these three theses. Columns 2, 3, and 4 represented the inclusion of the groups of variables representing each of the explanations separately, while column 5 reports the findings from the model that included measures representing all three explanations. The inclusion of the social bonding measures (column 2) revealed support for the notion that bonds to family and school (academic achievement) serve as a protective factor that reduces the odds of one engaging in drug selling, all other variables held constant. For instance, for a one-unit increase in the strength of the parental bond, the odds of *not* selling drugs increase by 1.56 times (a similar result was found for academic achievement and drug selling).

An exploration of the purposeful business activity model was extended to include another measures of stress, recent live events, in addition to family financial stress. The inclusion of these family stressor variables revealed a more mixed pattern of results. Of the three measures (recent life events, parental employment, and family financial situation), only exposure to recent life events was found to be a statistically significant predictor of drug selling. Greater exposure to stressful events was associated with an increased likelihood of being involved in drug selling. This finding, coupled with the failure to evince support that

the other two financial-related measures were significant predictors of drug selling, suggests that the aforementioned explanation identifying financial distress as a motivator of drug selling may need reworking when exploring the roots of rural drug selling (more on this in section 5).

Finally, of the two measures capturing exposure to substance users (column 4), only one measure—peer substance use—was found to be a statistically significant predictor of drug selling ($p < .05$). A one-unit increase in peer substance use increased the odds of drug selling about 2.1 times, controlling for all other variables. The importance of peer substance use as a predictor of the dependent variable was further illuminated by the model that included all three sets of explanatory variables (column 5). When all three sets of variables were included, the strength of the social bond measures (parental bond and academic achievement) were attenuated and failed to reach statistical significance. While speculative, the pattern of findings suggests that weak bonds to family and school were associated with having substance-using friends, although the direction of the relationship is unknown (and indeed, may be bi-directional; see Thornberry, 1987). While the association between recent life events and drug selling was attenuated somewhat, it remained a statistically significant predictor of the dependent variable.

The two measures of deviant behavior—delinquent acts and substance use—also proved to be potent predictors of drug selling, as expected. A one-unit increase in involvement in delinquent activity increased the odds of drug selling about 1.4 times, while a one-unit increase in involvement in substance use increased the odds of drug selling by approximately 3 times (holding all other variables constant). The inclusion of the substance use measures partially mediated the association between recent life events and drug selling to the point that the measure of stressful events was no longer a statistically significant predictor of the dependent variable.

In order to evaluate whether the theoretically relevant variables predicting drug selling vary by race, we examined models that included interaction terms (race*explanatory variable).³ While we examined each of the seven explanatory variables by race, only two of these race interactions (column 7 and 8) emerged as statistically significant ($p < .05$)—recent life events and academic achievement.⁴ Figure 1 illustrates the interaction between race and recent life events. As one can adduce from this figure, exposure to recent life events was an important predictor of drug selling among adolescent AIs, but had no predictive utility for non-Hispanic whites. We will discuss this conditional relationship below.

The other significant interaction term, race and academic achievement, revealed that the effectiveness of school bonding as a protective factor against drug selling differs greatly by

³A number of scholars (e.g., Hoetker, 2007; Zelner, 2009) caution against interpreting interaction terms in nonlinear models in the same way as they are interpreted in OLS regressions. In nonlinear models, the significance of the interaction effect cannot be determined just by the significance of the interaction coefficient (Hoetker, 2007: 336). There can be a significant interaction effect for some observations when the coefficient is not statistically significant, and conversely some observations may not have a significant interaction effect when the coefficient is statistically significant. Hoetker (2007) recommends graphical presentations to “provide a more nuanced understanding of the practical effect” (pg. 337). We follow this advice and provide graphical illustrations of a select interaction.

⁴Due to the overlap between predictors of substance use and drug selling, we exclude the measure of self-reported substance use from the models examining interactions.

race. For non-Hispanic whites, academic achievement appears to be an effective protective factor, with higher grades associated with a decreased likelihood of drug selling. However, academic achievement appears to have no protective influence on the likelihood of drug selling among AIs and indeed, appears to exacerbate the risk of drug selling (more on this awkward finding in the discussion).

Finally, in separate analyses (not reported, available upon request), we also examined 3 separate categories of drug selling (marijuana use, prescription drug sales, and other illicit drugs [methamphetamine, cocaine/crack and/or heroin]) in order to evaluate whether the type of drug sold made any differences in the pattern of correlates from the overall models. The results of these analyses revealed little difference in the pattern of significant correlates, suggesting that the factors that drive drug selling differ little by type of drug being sold.⁵

4. Discussion

The purpose of the present study was to assess the suitability of existing explanations of adolescent drug selling for a unique population. Prior research that has explored the risk and protective factors associated with drug selling has almost exclusively focused on adolescents residing in urban areas and white, African-American, and Hispanic adolescents. Our study extends prior research by exploring the utility of past explanations to novel groups/setting—American Indian and white students in rural settings. To this end, we explored three explanations forwarded by Steinman (2005): a) social bonding; b) social networks supporting drug use; and c) a purposeful business activity model that was extended beyond financial stress. In general, we found support for all three explanations as viable accounts for drug selling among our sample. Our findings contribute to a small but growing literature on the correlates of drug selling. Below we elaborate on the findings regarding each hypothesis, as well as discussing how these risk and protective factors help make sense of the race difference in drug selling.

First, we found support for the notion that social bonds serve as a protective factor against drug selling. Our two measures, parental bonding and academic achievement, were both found to be significant predictors of drug selling, a finding that is consistent with other studies that have found such social bonds as poor academic performance to be associated with drug selling (Uribe & Ostrov, 1989; Black & Ricardo, 1994). Likewise, we found that exposure to social networks supporting drug use, namely exposure to substance using peers, was a significant predictor of drug selling, controlling for other variables. This finding has been uncovered in other studies predicting drug use (Altschuler & Brounstein, 1991; Little & Steinberg, 2006). Finally, one measure of family stressors—recent life events—was found to be a robust predictor of drug selling. However, two other measures of financial disadvantage, parental employment and family financial situation, which (arguably) better encapsulate the thesis that financial circumstances render drug selling attractive, were not found to be statistically significant predictors of drug selling.

---

⁵The only major difference in the pattern of findings was the failure of one of the interaction terms—American Indian * recent life events—to reach statistical significance in the models predicting separate drugs being sold.

In a model including all three sets of predictor variables (representing social bonding, social networks supporting drug use, and family stressors); we found that the strength of the two social bonding measures (family bonding and academic achievement) were greatly attenuated once the other measures (i.e., recent life events and peer substance use) were included, reducing the measures to statistical non-significance. Although we cannot formally evaluate the causal sequences necessary to demonstrate mediation because our data were cross-sectional in nature (see Baron & Kenney, 1986), the pattern of findings suggest that poor school performance and the quality of the affective bond between parent and child may be weakened when adolescents befriend delinquent peers (although, as mentioned earlier, the relationship may be bi-directional; see Thornberry, 1987). Additionally the bond between parent and adolescent, as well as school performance, may suffer when the adolescent endures significant stressful experiences (i.e., recent life events); this interpretation is supported by prior work that has established a link between exposure to stressors and weakened bonds such as school bonding (Windle & Windle, 1996; Garnier, Stein & Jacobs, 1997).

Our results also provide some explanation for the ‘race gap’ found in drug selling, with AI adolescents at greater risk of drug selling than non-Hispanic whites. Indeed, our findings revealed that once the explanatory variables were considered, race was not a significant predictor of drug selling. Coupled with the differences in means (reported in Table 1), our findings suggest that the higher rate of AI drug selling was largely due to differences in risk and protective factors—greater exposure to stressors, weaker bonds (especially academic achievement), and greater exposure to peer and family drug users. But the most provocative findings were revealed in the tests for moderators. We found that two predictors of drug selling—exposure to recent life events and academic achievement, exhibited stark differences in their respective associations with the dependent variable across racial groups. Our finding that exposure to recent life events was a predictor of drug selling for AIs is consistent with the aforementioned purposeful business activity thesis. However, we uncovered no such relationship between recent life events and drug selling for whites. While speculative, this finding suggests that other processes may be more instrumental in leading non-Hispanic white adolescents to sell drugs than need/disadvantage. Clearly, further research is needed that can tease out the relationship between class, race, and drug selling. But our finding that academic achievement, while serving as a protective factor for non-Hispanic whites, appeared to increase the risk of drug selling among AIs, may be the most unexpected. Unfortunately, our data do not provide a definitive explanation as to why such a provocative finding was uncovered in our analyses. While speculative, one possibility is that AIs who perform well in school experience cultural conflict. Although hotly debated (see Warikoo & Carter, 2009 for an overview), such cultural conflict may create strain for racial/ethnic minority students who perceive that academic achievement entails a rejection of their own cultural identity in order for them to achieve in white-dominated status hierarchies (Fordham & Ogbu, 1986).

4.1. Limitations and future directions

To the best of our knowledge, this study represents the first study examining risk and protective factors associated with AI and non-Hispanic white rural adolescent drug selling.

Despite the provocative nature of our findings, there are limitations that should be considered. First, our data was collected in one rural state in the Northwestern United States, with AI respondents representing only a couple of the 565 federally recognized tribes (with many more tribes that are not so acknowledged by the United States), each with their own unique cultures and experiences. Hence, readers should be cautious in interpreting these results as applying to AIs more generally.

Second, we analyzed self-reported data on sensitive illegal behaviors, drug use and drug selling, which might result in under-reporting generally or differences in accurate reporting by racial group. There is also some evidence that sporadic drug distributors may be unlikely to report their behaviors as a drug seller due to their understanding of what it is to be a drug dealer or seller (Harrison and Hughes, 1997). While we took precautions to make respondents understand that their responses were confidential, it is also possible that administering the surveys at school may have compromised honesty if students felt their teachers or parents might be made aware of their responses.

Third, we lacked a comprehensive array of measures that would (ideally) allow us to fully test the aforementioned theses. We lacked information on family or personal income, for instance that (arguably) would be a stronger measure of the purposeful business activity thesis. Additionally, our measure of drug selling was based on items that asked if the respondent had engaged in drug selling in the past year. While such a measure has been utilized in past measures of drug use, it nonetheless does not capture what may be important distinctions in one's commitment to drug selling, how often one sells drugs, or the volume of drugs sales. Moreover, this measure does not allow for consideration that the distribution of drugs can occur through other means than buying and selling and if such means differ by race it may account for differences in drug selling between racial groups. More comprehensive measures may reveal differences not detected in the current study. Likewise, our measure of substance use was merely a count of the different substances the respondent reported using in the past year. This measure results in those who might experiment with multiple types of drugs once being scored higher than someone who is a more frequent user of one or two substances. Future research on drug selling should incorporate more comprehensive measures of substance use that capture frequency of use as well as diversity of drugs used. Furthermore, we must recognize the inherent limitations of depending upon self-report measures instead of official means of measuring drug selling, including issues of over- and underreporting (e.g., Huizinga and Elliott, 1986). However, race differences in substance use (a strong correlate of drug selling according to other drug selling studies, e.g., Steinman, 2005; Felson et al., 2012) that have been found in other studies (e.g., Beauvais, 1992; Plunkett & Mitchell, 2000), provide some support for the utility and validity of our findings. Nonetheless, additional research using alternative measures of drug selling are likely to make important contributions to our understanding of drug use and drug selling in rural communities.

Finally, because our data are cross-sectional, we cannot address issues of causality, the initiation, changes in drug-selling trajectories, or desistance from such behavior. For instance, Van Kammen and Loeber (1994; 22) noted that for many teens, drug selling appears to be transitory behavior, with more than half of the boys in their study

discontinuing drug selling behaviors after their initial involvement. Further research is needed to explore such behaviors with longitudinal data.

Conclusion

The purpose of this study was twofold: a) to extend prior research exploring the risk and protective factors associated with adolescent drug selling to a rural population; and b) to include an understudied population—American Indian adolescents. Our study, coupled with past findings that have failed to find support for financial stress predicting drug selling (e.g., Friedman et al., 2003; Floyd et al., 2010), suggest that the process linking resource deprivation to drug selling may be more complex than originally theorized. The purposeful business activity model has focused on family financial stress, but our finding that a measure of recent stressful life events, which often produce financial as well as emotional strain within families, was associated with drug selling for AIs lends some support for the notion that drug selling could be a coping mechanism for some youth confronted with few legitimate money-earning opportunities. Certainly, our research suggests that the association between stress exposure and drug selling may be myriad and more complex than merely experiencing financial strain.

The racial difference in the effect of academic achievement on drug selling was also not anticipated, but is a cause for particular concern for schools educating AI students. Having higher grades was protective for drug selling among non-Hispanic white students, but it was a risk factor for AIs. Drawing on Denham's (2008) notion that American Indian adolescents' experiences in schools are interpreted through a shared narrative passed down from prior generations and used to give meaning to current experiences (p. 406). This narrative (that often features stories of resistance to acculturation in boarding schools) creates stress in the academically committed student. In other words, what we may be capturing here is a form of *acculturation stress*, which (as with other stressors) increases the risk of drug selling. Or it may be an anomalous finding due to our small sample. Our findings, while reinforcing evidence found in studies of urban drug selling, do suggest that the dynamics underlying drug selling in rural America may be somewhat unique for AIs in particular. Additional research into the correlates of AI drug selling is necessary to explore whether our findings are unique to the rural AI groups we studied or can be applied more widely.

Acknowledgments

Financial assistance for this study was provided to the authors by National Institutes of Drug Abuse [5R03DA029212-02]. The study design, data collection, and content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Funding: Financial assistance for this study was provided to the authors by National Institutes on Drug Abuse (1R01DA034466-01). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Appendix A. Select items comprising measures included in analyses

Scales	Items
Recent Stressful Life Events Index $\alpha = .77$ (Higher values indicate greater numbers of recent stressful life events.)	Participants were prompted: "Have any of the following events happened to you?"
	A serious injury or accident
	Serious illness
	Death of someone close to you
	Trouble with the police
	Something stolen/taken
	Beaten up or physically attacked
	Unwanted pregnancy
	Abortion/miscarriage
	Arrested for a crime
	Dropped out of school
	Failed a grade
	Abandoned by parents or put up for adoption
	Loss of home/apartment because of fire or other natural disaster
	Forced to do something sexual that you did not want to do
	Physically abused by someone close to you
	Emotionally abused by someone close to you
	Witness a close relative (parent, sibling) abused physically or emotionally
	Shot at with a gun or threatened with another weapon (but not hurt)
	Shot or stabbed and hurt
	Witness someone outside of your home get shot, stabbed, or beaten
	Witness someone outside of your house die
	I was happy
	I talked less than usual
	I felt lonely
	People were unfriendly
	I enjoyed life
	I had crying spells
	I felt sad
	I felt that people disliked me
	I could not "get going"
Parental Bonding $\alpha = .91$ (Higher values indicate greater levels of parental bonding.)	Your mother/female guardian seems emotionally cold towards you
	Your mother/female guardian is loving towards you (reverse)

Scales	Items
	Your mother/female guardian can make you feel better when you are upset (reverse)
	Your mother/female guardian seems to understand your problems (reverse)
	Your mother/female guardian speaks to you in a warm and friendly voice (reverse)
	Your mother/female guardian enjoys talking things over with you (reverse)
	Your father/male guardian seems emotionally cold towards you
	Your father/male guardian is loving towards you (reverse)
	Your father/male guardian can make you feel better when you are upset (reverse)
	Your father/male guardian seems to understand your problems (reverse)
	Your father/male guardian speaks to you in a warm and friendly voice (reverse)
Delinquency	Respondents were prompted: Tell us if you have engaged in any of the following behaviors—remember that your responses are completely confidential (Check all that apply).
	Been a gang member
	Taken money or things from another person by force or by using a weapon
	Snatched someone's stuff (like a wallet or jewelry) without the person knowing it
	Broken into a house, store, or building
	Damaged or destroyed property on purpose that did not belong to you
	Taken a car for a ride without the owner's permission
	Taken more than \$20 from a family member
	Got in a fist fight with someone
	Pulled a weapon (gun, knife, club) on someone
	Taken something of value from someone else in order to buy drugs

References

- Altschuler DM, Brounstein PJ. Patterns of drug use, drug trafficking, and other delinquency among inner-city adolescent males in Washington, DC. *Criminology*. 1991; 29:589–622.
- Arkes J. Does the economy affect teenage substance use? *Health Economics*. 2007; 16:19–36. [PubMed: 16960850]
- Arkes J. Recessions and the participation of youth in the selling and use of illicit drugs. *The International Journal On Drug Policy*. 2011; 22:335–340. [PubMed: 21482093]
- Avison WR, Turner RJ. Stressful life events and depressive symptoms: Disaggregating the effects of acute stressors and chronic strains. *Journal of Health & Social Behavior*. 1988; 29:253–264. [PubMed: 3241066]

- Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychology research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*. 1986; 51:1173–1182. [PubMed: 3806354]
- Beauvais F. Comparison of drug use rates for reservation Indian, non-reservation Indian and Anglo youth. *American Indian and Alaska Native Mental Health Research*. 1992; 5:12–31.
- Beauvais F, Jumper-Thurman P, Burnside M. The changing patterns of drug use among American Indian students over the past thirty years. *American Indian and Alaska Native Mental Health Research*. 2008; 15:15–24. [PubMed: 19085827]
- Bellair PE, McNulty TL. Gang membership, drug selling, and violence in neighborhood context. *Justice Quarterly*. 2009; 26:644–669. [PubMed: 25429188]
- Black MM, Ricardo IB. Drug-use, drug trafficking, and weapon carrying among low-income, African-American, early adolescent boys. *Pediatrics*. 1994; 93:1065–1072. [PubMed: 8197009]
- Boyd S. Media constructions of illegal drugs, users, and sellers: a closer look at *Traffic*. *International Journal of Drug Policy*. 2002; 13:397–407.
- Boyd S. Drug films, justice, and nationhood. *Contemporary Justice Review*. 2007; 10:263–282.
- Bush PJ, Iannotti RJ. Alcohol, cigarette, and marijuana use among fourth-grade urban schoolchildren in 1988/89 and 1990/91. *American Journal of Public Health*. 1993; 83:111–114. [PubMed: 8417594]
- Centers NL, Weist MD. Inner city youth and drug dealing: A review of the problem. *Journal of Youth and Adolescence*. 1998; 27:395–411.
- Cernkovich SA, Giordano P, Rudolph JL. Race, crime, and the American dream. *Journal of Research in Crime and Delinquency*. 2000; 37(2):131–70.
- Chaiken, M. Office of Juvenile Justice and Delinquency Prevention. Rockville, MD: U.S. Department of Justice; 2000. *Violent Neighborhoods, Violent Kids*.
- Costello EJ, Farmer EM, Angold A, Burns BJ, Erkanli A. Psychiatric disorders among American Indian and white youth in Appalachia: The great smoky mountains study. *American Journal of Public Health*. 1997; 87:827–832. [PubMed: 9184514]
- De La Rosa M, Lambert EY, Gropper B. Drugs and violence: causes, correlates and consequences. *National Institute on Drug Abuse Research Monograph*. 1990:VIII+283P–VIII+283P.
- Dembo R, Hughes P, Jackson L, Mieczkowski T. Crack cocaine dealing by adolescents in two public housing projects: A pilot study. *Human Organization*. 1993; 52:86–96.
- Dembo R, Williams L, Wothke W, Schmeidler J, Getreu A, Berry E, et al. The relationship between cocaine use, drug sales, and other delinquency among a cohort of high-risk youths over time. *NIDA Research Monograph*. 1990; 103:112–135. [PubMed: 2096284]
- Denham AR. Rethinking historical trauma: Narratives of Resilience. *Transcultural Psychiatry*. 2008; 45(3):391–414. [PubMed: 18799640]
- Dennis MK. Risk and protective factors for HIV/AIDS in Native Americans: Implications for Preventive Intervention. *Social Work*. 2009; 54:147–154.
- Dunlap E, Graves J, Benoit E. Stages of drug market change during disaster: Hurricane Katrina and reformulation of the New Orleans drug market. *International Journal of Drug Policy*. 2012; 23:473–480. [PubMed: 22728093]
- Fagan J, Chin KI. Initiation into crack and cocaine: A tale of two epidemics. *Contemporary Drug Problems*. 1989; 16:579–618.
- Farquhar B. Meth rink targeted reservations. *Casper Star-Tribune*. 2005 Aug 21.
- Felson RB, Osgood DW, Horney J, Wiernik C. Having a bad month: general versus specific effects of stress on crime. *Journal of Quantitative Criminology*. 2012; 28:347–363.
- Flom PL, Friedman SR, Jose B, Curtis R. Peer norms regarding drug use and drug selling among household youth in a low-income 'drug supermarket' urban neighborhood. *Drugs-Education Prevention and Policy*. 2001; 8:219–232.
- Floyd LJ, Alexandre PK, Hedden SL, Lawson AL, Latimer WW, Giles N III. Adolescent drug dealing and race/ethnicity: A population-based study of the differential impact of substance use on involvement in drug trade. *American Journal of Drug and Alcohol Abuse*. 2010; 36:87–91. [PubMed: 20337503]

- Fordham S, Ogbu J. Black students' school success: Coping with the "burden of acting White". *Urban Review*. 1986; 18:176–206.
- Friedman SR, Flom PL, Kottiri BJ, Neaigus A, Sandoval M, Curtis R, Johnson BD, Des & Jarlais DC. Drug dealing and attitudes and norms about drug dealing among young adults and their peers in a high-risk community. *International Journal of Drug Policy*. 2003; 14(3):261–268.
- Frith K, McElwee G. An emergent entrepreneur? A story of a drug-dealer in a restricted entrepreneurial environment. *Society and Business Review*. 2007; 3(2):270–286.
- Garnier HE, Stein JA, Jacobs JK. The process of dropping out of high school: A 19-year perspective. *American Educational Research Journal*. 1997; 34:395–419.
- Greenfield, LA.; Smith, SK. *American Indians and Crime*. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics; 1999.
- Harrison, L.; Hughes, A. *The Validity of Self-Reported Drug Use: Improving the Accuracy of Survey Estimates*. National Institute on Drug Abuse, Research Monograph, United State Department of Health and Human Services; 1997. Introduction: The validity of self-reported drug use: Improving the accuracy of survey Estimates.
- He Y, Zaslavsky AM, Landrum MB, Harrington DP, Catalano P. Multiple imputation in a large-scale complex survey: a practical guide. *Statistical Methods in Medical Research*. 2010; 19:653–670. [PubMed: 19654173]
- Herring RD. Substance use among Native American Indian youth: A selected review of causality. *Journal of Counseling and Development*. 1994; 72:578–592.
- Herz, DC. *Series: NIJ Research in Brief*. Washington, D.C.: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice; 2000. *Drugs in the Heartland: Methamphetamine Use in Rural Nebraska*.
- Hirschi, T. *Causes of Delinquency*. Berkeley, CA: University of California Press; 1969.
- Hoetker G. The use of logit and probit models in strategic management research: Critical issues. *Strategic Management Journal*. 2007; 28:331–343.
- Hoffmann JP, Su SS. Stressful life events and adolescent substance use and depression: Conditional and gender differentiated effects. *Substance Use & Misuse*. 1998; 33:2219–2262. [PubMed: 9758012]
- Huizinga D, Elliott DS. Reassessing the reliability and validity of self-report delinquency measures. *Journal of Quantitative Criminology*. 1986; 2:293–327.
- Hunt K, Furst RT. A select annotated bibliography: Illegal drug research in rural and suburban areas. *Journal of Psychoactive Drugs*. 2006; 38:173–188. [PubMed: 16903457]
- Iguchi MY. Elements of well-being affected by criminalizing the drug user. *Public Health Reports*. 2002; 117(S1):S146–S150. [PubMed: 12435838]
- Inciardi, JA. The crack-violence connection within a population of hard-core adolescent offenders. In: De La Rosa, M.; Lambert, EY.; Gropper, B., editors. *Drugs and Violence: Causes, Correlates, and Consequences*. Rockville, MD: U.S. Department of Health and Human Services; 1990. p. 92-111.
- Iritani BJ, Hallfors DD, Bauer DJ. Crystal methamphetamine use among young adults in the USA. *Addiction*. 2007; 102(7):1102–1113. [PubMed: 17567398]
- Jessor, R.; Jessor, SL. *Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth*. New York: Academic Press; 1977.
- Levitt, SD.; Lochner, L. The determinants of juvenile crime. In: Gruber, J., editor. *Risky Behavior among Youths: An Economic Analysis*. Chicago, III: University of Chicago Press; 2001.
- Li X, Stanton B, Feigelman S. Impact of perceived parental monitoring on adolescent risk behavior over 4 years. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*. 2000; 27:49–56. [PubMed: 10867352]
- Li XM, Feigelman S. Recent and intended drug trafficking among male and female urban African-American early adolescents. *Pediatrics*. 1994; 93:1044–1049. [PubMed: 8197005]
- Li XM, Stanton B, Black MM, Feigelman S. Persistence of drug trafficking behaviors and intentions among urban African American early adolescents. *Journal of Early Adolescence*. 1996; 16:469–487.

- Little M, Steinberg L. Psychosocial correlates of adolescent drug dealing in the inner city - Potential roles of opportunity, conventional commitments, and maturity. *Journal of Research in Crime and Delinquency*. 2006; 43:357–386. [PubMed: 20011229]
- MacCoun R, Reuter P. Are the wages of sin \$30 an hour? Economic aspects of street-level drug dealing. *Crime & Delinquency*. 1992; 38(4):477–491.
- Maryland State Department of Education. Maryland Adolescent Drug Survey. Baltimore: Author; 1992.
- McElwee G, Smith R, Somerville P. Theorising illegal Rural Enterprise: Is everyone at it? *International Journal of Rural Criminology*. 2011; 1(1):40–62.
- Mitchell CM, Kaufman CE. Health Ways Project Team, P. O. C. A. Structure of HIV knowledge, attitudes, and behaviors among American Indian young adults. *AIDS Education and Prevention*. 2002; 14(5):401–418. [PubMed: 12413186]
- Mocan HN, Rees DI. Economic conditions, deterrence and juvenile crime: Evidence from micro data. *American Law and Economics Review*. 2005; 7:319–349.
- Morris GD, Wood PB, Dunaway RG. Self-control, native traditionalism, and Native American substance use: Testing the cultural invariance of a general theory of crime. *Crime & Delinquency*. 2006; 52(4):572–598.
- National Drug Intelligence Center. Louisiana Drug Threat Assessment. Johnstown, PA: U.S. Department of Justice; 2001.
- O'dea, PJ.; Murphy, B.; Balzer, C. Traffic and illegal production of drugs in rural America. In: Robertson, ER.; Sloboda, Z.; Boyd, GM.; Beatty, L.; Kozol, N., editors. *Rural Substance Use: State of Knowledge and Issues*. Rockville, MD: U.S. Department of Health and Human Services; 1997. p. 79-89.
- Oetting ER, Beauvais F. Adolescent drug use: Findings of national and local surveys. *Journal of Consulting and Clinical Psychology*. 1990; 58:385–394. [PubMed: 2212174]
- Oetting ER, Deffenbacher JL, Taylor MJ, Luther N, Beauvais F, Edwards RW. Methamphetamine use by high school students: recent trends, gender and ethnicity differences, and use of other drugs. *Journal of Child & Adolescent Substance Abuse*. 2000; 10(1):33–50.
- Office of Applied Studies. Substance use and substance use disorders among American Indians and Alaska Natives. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2007.
- Parker G, Tupling H, Brown LB. A parental bonding instrument. *British Journal of Medical Psychology*. 1979; 52:1–10.
- Perry, SW. American Indians and Crime: A BJS Statistical Profile, 1992-2002. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics; 2004.
- Plunkett M, Mitchell CM. Substance use rates among American Indian adolescents: Regional comparisons with monitoring the future high school seniors. *Journal of Drug Issues*. 2000; 30:575–591.
- Press, A. Raid yields 40,000 pot plants on reservation. *Seattle Times*. 2007 Aug 11.
- Pridemore WA. Review of the literature on risk and protective factors of offending among Native Americans. *Journal of Ethnicity in Criminal Justice*. 2004; 2(4):45–63.
- Reuter, PH.; MacCoun, RJ.; Murphy, P.; Abrahamse, A.; Simon, B. *Money from Crime*. Santa Monica, CA: Rand Corporation; 1990.
- Rhodes T. Risk environments and drug harms: A social science for harm reduction approach. *International Journal of Drug Policy*. 2009; 20(3):193–201. [PubMed: 19147339]
- Sanders, B.; Deeds, B.; Thomas, YF. *Crime, HIV and Health: Intersections of Criminal Justice and Public Health Concerns*. Springer; Netherlands: 2013. Crime and public health in the United States; p. 1-16.
- Schensul JJ, Huebner C, Singer M, Snow M, Feliciano P, Broomhall L. The high, the money, and the fame: The emergent social context of “new marijuana” use among urban youth. *Medical Anthropology*. 1998; 18(4):389–414.
- Schensul JJ, Burkholder GJ. Vulnerability, social networks, sites, and selling as predictors of drug use among urban African American and Puerto Rican emerging adults. *Journal of Drug Issues*. 2005; 35:379–407.

- Slocum LA, Simpson SS, Smith DA. Strained lives and crime: Examining intra-individual variation in strain and offending in a sample of incarcerated women. *Criminology*. 2005; 43:1067–1110.
- Sommers I, Baskin DR. Situational or generalized violence in drug dealing networks. *Journal of Drug Issues*. 1997; 27:833–849.
- Stanton B, Galbraith J. Drug trafficking among African-American early adolescents: Prevalence, consequences, and associated behaviors and beliefs. *Pediatrics*. 1994; 93:1039–1043. [PubMed: 8197004]
- StataCorp. Stata: Release 11 Statistical Software. College Station, TX: StataCorp LP; 2009.
- Steinman KJ. Drug selling among high school students: related risk behaviors and psychosocial characteristics. *The Journal of Adolescent Health: Official publication of the Society for Adolescent Medicine*. 2005; 36:71.e71–78. [PubMed: 15661603]
- Substance Abuse and Mental Health Services Administration (SAMHSA). Overview of findings from the 2004 National Survey of Drug Use and Health. Office of Applied Studies; Rockville, MD: 2005. NSDUH Series H-27DHHS Publication No. SMA 05-4061
- Thornberry TP. Toward an interactional theory of delinquency. *Criminology*. 1987; 25:863–891.
- Turner RJ, Gil AG. Psychiatric and substance use disorders in South Florida: Racial/ethnic and gender contrasts in a young adult cohort. *Archives of General Psychiatry*. 2002; 59:43–50. [PubMed: 11779281]
- Turner RJ, Lloyd DA. Cumulative adversity and drug dependence in young adults: Racial/ethnic contrasts. *Addiction*. 2003; 98:305–315. [PubMed: 12603230]
- Turner RJ, Wheaton B, Lloyd DA. The epidemiology of social stress. *American Sociological Review*. 1995; 60:104–125.
- Uribe VM, Ostrov E. Correlations of substance abuse and self-image among socially diverse groups of adolescents and clinical implications. *Hillside Journal of Clinical Psychiatry*. 1989; 11:25–34. [PubMed: 2613185]
- U.S. Senate Select Committee on Indian Affairs. Fiscal Year 1985 Budget. Washington D.C.: United States Congress; 1985. Hearings before the Select Committee on Indian Affairs, United States Senate, Ninety-Eighth Congress, Second Session on the Fiscal Year 1985 Budget.
- Vankammen WB, Loeber R. Are fluctuations in delinquent activities related to the onset and offset in juvenile illegal drug-use and drug dealing. *Journal of Drug Issues*. 1994; 24:9–24.
- Warikoo N, Carter P. Cultural explanations for racial and ethnic stratification in academic achievement: A call for a new and improved theory. *Review of Educational Research*. 2009; 79:366–394.
- Weinfurt KP, Bush PJ. Peer assessment of early adolescents solicited to participate in drug trafficking: A longitudinal analysis. *Journal of Applied Social Psychology*. 1995; 25:2141–2157.
- Weingarten P, Coates J. Drugs blaze new paths: Interstates, backroads join courier system. *The Chicago Tribune*. 1989 Sep 12.
- Weisheit R, Donnermeyer JF. Change and continuity in crime in rural America. *Criminal Justice*. 2000; 1:309–357.
- Weisheit RA. Studying drugs in rural areas: Notes from the field. *Journal of Research in Crime and Delinquency*. 1993; 30:213–232.
- Whitbeck, Les B.; Yu, Mansoo; Johnson, Kurt D.; Hoyt, Dan R.; Walls, Melissa L. Diagnostic Prevalence Rates From Early To Mid-Adolescence Among Indigenous Adolescents: First Results from a Longitudinal Study. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2008; 47:890–900. [PubMed: 18596558]
- Whitehead TL, Peterson J, Kaljee L. The “hustle”: Socioeconomic deprivation, urban drug trafficking, and low-income, African-American male gender identity. *Pediatrics*. 1994; 93:1050–1054. [PubMed: 8197006]
- Windle M. A longitudinal study of stress buffering for adolescent problem behaviors. *Developmental Psychology*. 1992; 28:522–530.
- Windle M, Windle RC. Coping strategies, drinking motives, and stressful life events among middle adolescents: Associations with emotional and behavioral problems and with academic functioning. *Journal of Abnormal Psychology*. 1996; 105:551–560. [PubMed: 8952188]

- Wood, D. Review of Research on Alcohol and Drug Use, Criminal Behavior, and the Criminal Justice System Response in American Indian and Alaska Native Communities. U.S. Department of Justice, National Institutes of Justice; 2009.
- Young RS, Joe JR. Some thoughts about the epidemiology of alcohol and drug use among American Indian/Alaska Native populations. *Journal of Ethnicity in Substance Abuse*. 2009; 8:223–241. [PubMed: 25985068]
- Zelner BA. Using simulation to interpret results from logit, probit, and other nonlinear models. *Strategic Management Journal*. 2009; 30:1335–1348.

Figure 1. Expected probabilities of drug selling for various values of recent life events by race

Figure 2. Expected probabilities of drug selling for various values of academic achievement by race

Table 1

Descriptive Characteristics for American Indians and Non-Hispanic White Adolescents (95% confidence interval in parentheses).

	American Indians	Non-Hispanic Whites
Drug selling past year (sold meth, cocaine/crack, heroin, marijuana, or prescription drugs = 1)	.200 (.129 - .271)	.088** (.061 - .115)
Marijuana selling past year (=1)	.176 (.108 - .244)	.084** (.058 - .109)
Prescriptions drug selling past year (=1)	.144 (.082 - .206)	.034*** (.017 - .051)
Female (=1)	.480 (.391 - .569)	.564 (.518 - .611)
Age	15.792 (15.493 - 16.091)	15.831 (15.704 - 15.959)
Family Structure (1=two parent family)	.472 (.383 - .561)	.614** (.568 - .659)
Parental Employment (1=at least one parent is employed)	.765 (.687 - .842)	.934*** (.911 - .957)
Recent Life Events	3.576 (3.059 - 4.093)	2.594** (2.334 - 2.850)
Family financial situation (1=family is struggling to get by)	.144 (.081 - .207)	.077* (.051 - .102)
Parental bonding	-.073 (-.242 - .096)	.034 (-.058 - .126)
Academic achievement	2.020 (1.788 - 2.252)	2.803*** (.2.692 - 2.915)
Family substance use	1.104 (.862 - 1.346)	.704*** (.626 - .783)
Peer substance use	2.660 (2.370 - 2.950)	2.169** (2.022 - 2.315)
Delinquency	.790 (.571 - 1.009)	.454** (.347 - .561)
Substance Use	.856 (.081 - .207)	.377*** (.307 - .447)

Note:

***
= $p < .001$

**
= $p < .01$

*
= $p < .05$ based on the conditional (equal fraction-missing-information, FMI) test of Li et al. (1991).

Table 2
Logistic regression predicting drug selling (n=568; odds ratios reported, standard errors in parentheses)

	1	2	3	4	5	6	7	8
<i>Controls</i>								
Gender	.371 ** (.107)	.412 ** (.124)	.299 *** (.094)	.300 *** (.098)	.300 *** (.106)	.380 * (.149)	.404 * (.142)	.406 * (.146)
Age	1.230 * (.118)	1.191 (.119)	1.205 (.125)	1.107 (.124)	1.093 (.126)	1.060 (.131)	1.144 (.135)	1.177 (.139)
Family structure	.404 ** (.115)	.522 * (.154)	.498 * (.151)	.412 ** (.135)	.533 (.182)	.534 (.192)	.516 (.180)	.541 (.185)
American Indian	2.215 * (.644)	1.791 (.552)	1.858 (.599)	1.802 (.603)	1.441 (.527)	1.137 (.457)	.518 (.333)	.443 (.286)
<i>Social bonding</i>								
Parental bonding		.640 ** (.094)			.787 (.133)	.929 (.165)	.861 (.146)	.874 (.146)
Academic achievement		.657 ** (.081)			.794 (.110)	.803 (.118)	.745 * (.106)	.614 ** (.107)
<i>Stressors</i>								
Recent life events			1.335 *** (.062)		1.135 * (.062)	1.051 (.068)	.987 (.069)	1.057 (.060)
Parental employment			.612 (.272)		.409 (.210)	.367 (.202)	.354 * (.187)	.369 (.190)
Family financial situation			.880 (.418)		.685 (.362)	.623 (.344)	.597 (.318)	.619 (.322)
<i>Exposure to substance users</i>								
Family substance use				1.283 (.165)	1.211 (.165)	1.029 (.169)	1.269 (.177)	1.316 * (.176)
Peer substance use				2.137 *** (.228)	2.007 *** (.234)	1.600 *** (.188)	1.854 *** (.204)	1.789 *** (.195)
<i>Self reported deviant behaviors</i>								
Delinquency						1.374 * (.200)	1.577 ** (.212)	1.524 ** (.205)
Substance Use						3.005 *** (.618)		
<i>Select Interactions</i>								
American Indian * recent life event							1.259 * (.147)	
American Indian * academic achievement								1.857 * (.513)
Constant	.009 ** (.014)	.032 * (.053)	.007 ** (.012)	.004 ** (.008)	.014 * (.208)	.022 (.046)	.011 * (.023)	.008 * (.017)
F	8.60 ***	8.58 ***	8.71 ***	12.97 ***	7.24 ***	7.33 ***	7.20 ***	6.84 ***

Note:

Eitle and Eitle

(s) test paper-own) 50% $d =$
*

10% $d =$
**

100% $d =$
***

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript