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Crime Delinquency 2006; 52; 572

DOI: 10.1177/001128705282988

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Self-Control, Native Traditionalism, and Native American Substance Use: Testing the Cultural Invariance of a General Theory of Crime

Gregory D. Morris
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Using a sample of White and Native American high school students, the authors provide a test of (a) self-control theory's invariance thesis and (b) native traditionalism as an explanation of Native American substance use. Self-control significantly influenced all forms of substance use when controlling for race and in race-specific analyses. However, z tests by race revealed that self-control is a stronger predictor of marijuana and serious drug use among Native Americans. Beyond this simple comparison across groups, the authors control for native traditionalism (as a proxy for cultural variation) among the Native American respondents. In doing so, self-control remained a consistent predictor of their substance use. Although these findings largely support the invariance thesis of self-control, the racial difference related to marijuana and serious drug use poses a theoretical challenge. With regard to native traditionalism, results suggest that those most attached to their native traditions engage in greater substance use.

Keywords: *cultural invariance; Native American; self-control; traditionalism; substance use*

In *A General Theory of Crime*, Gottfredson and Hirschi (1990) claim that self-control should predict crime, deviance, and analogous behaviors irrespective of group differences. Thus, the effect of self-control on behavioral outcomes should not vary by gender, age, race, or culture. Though self-

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CRIME & DELINQUENCY, Vol. 52 No. 4, October 2006 572-598

DOI: 10.1177/001128705282988

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control has been the most scrutinized of any criminological theory for more than a decade, specific tests of its invariance thesis are rare. Among the dozens of published studies, most have analyzed relatively homogenous or integrated samples or have not explicitly addressed cultural differences. Recent studies (Tittle, Ward, & Grasmick, 2003; Vazsonyi & Crosswhite, 2004) have incorporated cross-group tests of significance as a more stringent assessment of the invariance of self-control. Our study applies such tests to a sample of Native American and White adolescents. We then extend the invariance thesis by controlling for cultural variation among the Native American respondents while exploring the influence of self-control on their substance use.

Though Native Americans are said to be one of the most disproportionate offending groups in the United States, they remain among the least studied. Moreover, the etiology of Native American deviance is not well developed (Lester, 1999; Young, 1990). Arguably the most popular explanation of Native American deviance involves native traditionalism—the degree of enculturation into native customs. Though native traditionalism is persistently implicated as a source of Native American deviance, its acceptance is based on faith more than empiricism, with limited research generating mixed results (Beauvais, 1998; Ledlow, 1992; Morris, Crowley, & Morris, 2002). We are aware of no published work that applies self-control theory to a Native American sample.

We integrate common measures of self-control and native traditionalism to (a) provide an extended test of self-control theory's invariance thesis and (b) evaluate the potential of traditionalism as an explanation for Native American substance use. To do so, we utilize a sample of some 1,500 Oklahoma public high school students (1,122 Whites and 382 Native Americans). Our analysis begins by testing self-control theory while controlling for race. We then compare the influence of self-control by race as a preliminary test of the invariance thesis. This comparison includes tests of significance on any differential influences by race. The culmination of our analyses, which sets our study apart from previous attempts, is a race-specific regression that includes measures of native traditionalism that serve as a means of controlling for cultural variation to determine whether self-control explains substance use among Native Americans even when considering culturally relevant factors. By doing so, we move beyond the assumption that group affiliation equates to cultural distinction by examining the influence of cultural variation within our Native American sample. This last test also assesses the direct influence of traditionalism on Native American substance use as a competing predictor against self-control.

SELF-CONTROL THEORY AND CULTURAL INVARIANCE

Research has largely supported the ability of self-control to predict crime and analogous behaviors. A recent meta-analysis of 21 empirical studies (Pratt & Cullen, 2000), derived from 17 independent data sets, employing various operational measures of low self-control (attitudinal, behavioral, or both) and different methodological approaches (cross-sectional or longitudinal), concluded that self-control has a meaningful effect regardless of sample, analytical technique, or dependent variable (whether crime or analogous behavior).

Self-control theory is grounded in the assumption of human nature "as the self-interested pursuit of pleasure and the avoidance of pain" (Gottfredson & Hirschi, 1990, p. 5). Those who disproportionately surrender to their human nature exhibit low self-control. Rooted in the assumption of a universal human nature, low self-control is believed to have universal application as an explanation of criminal behavior. This does not mean low self-control inevitably leads to crime, nor must it account for most of the variance in criminal behavior, but the influence of low self-control on crime should be relatively equal for all subcategories of individuals (Tittle et al., 2003), culturally different groups being no exception.

Studies have compared self-control by age, gender, and race. Such analyses make sense given that Gottfredson and Hirschi (1990) point to them as the largest correlates of crime and that the influence of self-control is independent of them. However, Gottfredson and Hirschi also stress this demographic independence as a way of emphasizing the cultural invariance of self-control. As they note, "So far as we can determine, the important correlates of crime do not vary across culture" (p. 124). This being the case, it seems that comparison by culture is the definitive test of self-control as predictor of crime and deviance across subcategories. Gottfredson and Hirschi dedicate an entire chapter to the cultural transcendence of self-control, and it is here where they validate it as a general theory of crime:

Since traditional approaches to the problem of cross-cultural criminology have not succeeded and cannot succeed, a new approach is required. Our approach therefore rejects the conventional wisdom of comparative criminology. It assumes instead that cultural variability is *not* important in the causation of crime, that we should look for constancy rather than variability in the definition and causes of crime, and that a single theory of crime can encompass the reality of cross-cultural differences in crime rates. (pp. 174-175)

Although the vast majority of self-control research applies to relatively homogeneous samples gathered in the United States, a small but growing

number of studies address the cultural invariance thesis through cross-national comparisons. The bulk of these studies have examined the effects of self-control on crime or deviance among English-speaking and/or European countries. Four studies have sampled Canadians (Forde & Kennedy, 1997; Keane, Maxim, & Teevan, 1993; LaGrange & Silverman, 1999; Nakhaie, Silverman, & LaGrange, 2000), three have sampled New Zealanders (Caspi et al., 1994; Henry, Caspi, Moffitt, & Silva, 1996; Wright, Caspi, Moffitt, & Silva, 1999), two have sampled Germans (Marcus, 2003; Marcus, Schuler, Quell, & Huenpfner, 2002), and others have examined the self-control of British (Polakowski, 1994), Finnish (Pulkkinen & Hamalainen, 1995), Spanish (Romero, Gomez-Fraguela, Luengo, & Sobral, 2003), and Swiss youth (Killias & Rabasa, 1997). Vazsonyi (2003) and Vazsonyi, Pickering, Junger, and Hessing (2001) compared the effects of self-control among adolescents from Hungary, the Netherlands, Switzerland, and the United States.

Not surprisingly, the cross-national research among other Western countries has been consistent with studies using U.S. samples. There have been, however, only a few empirical studies examining the effect of low self-control among Asian samples. This is an important gap in the literature given the divergent sociocultural dimensions between East and West. Recent studies using Japanese and Korean adolescent samples have found at least partial support for a predictive effect of low self-control on delinquency. Vazsonyi, Wittekind, Belliston, and Van Loh (2004) find that among Japanese late adolescents, low self-control was positively related to an array of delinquent behaviors. However, they also found that low self-control was not related to male alcohol use and actually negatively related to female alcohol use. Hwang and Akers (2003) also find that low self-control modestly affects Korean adolescent substance use, though they note that this effect is diminished when measures of social learning theory are introduced into their model.

Although these cross-national tests lend support to the cultural invariance thesis, most employ idiosyncratic measures of self-control. For example, Henry et al. (1996) use a seven-item lack of control scale, and Keane et al. (1993) use seat belt wearing to measure self-control. Caspi et al. (1994) use three factors involving constraint, negative, and positive emotionality, whereas Killias and Rabasa (1997) employ a variable that they admit is "not really designed to measure the concept" (p. 450) of self-control. With the exception of the work by Vazsonyi and his associates (Vazsonyi, 2003; Vazsonyi & Crosswhite, 2004; Vazsonyi et al., 2001, 2004), none of the above mentioned studies employed the Grasmick, Tittle, Bursik, and Arneklev (1993) self-control scale to test the cultural invariance thesis (with these two studies

applying only 22 of the original 24 self-control items). And though these studies found the Grasmick et al. scale to significantly predict deviance in all five countries studied, each study assumes nationality equates to meaningful cultural differences without including any explicit measures of cultural variation.¹ Vazsonyi and Crosswhite (2004) continued this trend by applying the Grasmick et al. scale to a cross-cultural test between Black and White youth in the United States (assuming social or cultural, not biological, differences are of importance) and found no significant difference in the influence of self-control by race. Once again, no measures of cultural variation were applied. We agree with those who highlight the importance of the invariance thesis and hope to build on these cross-cultural tests by explicitly controlling for cultural variation when testing the influence of self-control.

Another invariant aspect of self-control theory involves the definition of crime. Gottfredson and Hirschi (1990) observe that crime is only one of the many possible outcomes of low self-control. If persons with low self-control commit crime because of immediacy, brevity of obligation, and/or lack of effort involved in the reward, they are also at risk to commit noncriminal acts that can be similarly rewarding. Such behaviors are known as acts analogous to crime (Gottfredson & Hirschi, 1990). These include but are not limited to illicit sex, accidents, job instability, workplace counterproductivity (see Marcus et al., 2002), poor diet, and of course drug use.

Specific to drug use, Wood, Pfefferbaum, and Arneklev (1993) found self-control to be a significant predictor of both legal and illegal substances. Arneklev, Grasmick, Tittle, and Bursik (1993) found self-control as a predictor of drinking but not smoking. Applying both attitudinal and behavioral self-control scales, Gibbs and Giever (1995) and Gibbs, Giever, and Martin (1998) found self-control as a significant influence on drinking and binge drinking among college students. Using two self-control measures and a summated substance use scale, Winfree and Bernat (1998) found that risk seeking significantly influenced drug use but impulsivity did not. For LaGrange and Silverman (1999), only present orientation significantly influenced drug offending. Hay (2001) found low self-control as a predictor of alcohol and drug use. Stylianou (2002) reported self-control as a significant predictor of smoking, drinking, and marijuana use, though the magnitude of the effect was distinctly greater for alcohol and marijuana. Keane et al. (1993), Nagin and Paternoster (1993, 1994), Strand and Garr (1994), and Piquero and Tibbetts (1996) all found support for self-control as a predictor of drunk driving or intentions to do so. Vazsonyi and Crosswhite (2004) report self-control as a significant influence on alcohol and drug use across gender and racial groups.

NATIVE TRADITIONALISM AND DEVIANCE

Native traditionalism is among the more popular explanations of Native American deviance (R. Bachman, 1991; Ledlow, 1992; Morris et al., 2002; Ogbu, 1987). Though the nomenclature varies, *traditionalism* is a term commonly used to represent the degree of enculturation or orientation toward one's native culture. It is argued that cultural differences between native traditions and the norms of White society generate strain, conflict, cultural dissonance, and anomie (Bynum, 1987; Dana, 1993). Hence, the degree of traditionalism is thought to place Native Americans at a cultural disadvantage when competing for society's rewards, which increases the likelihood of deviance. Despite its popularity, this explanation has attracted a good deal of criticism, the bulk of which centers on a lack of empirical analysis. As Ledlow (1992) and Ogbu (1987) have noted, most studies fail to address cultural variability as a research question or control for it when conducting analysis, instead choosing to assume that Native Americans differ culturally from their White counterparts. Such an assumption is also problematic because it fails to account for the cultural variation among Native Americans. Native Americans are a vastly heterogeneous group of more than 500 tribes, and they display tremendous variation in native enculturation depending on region, reservation residence, and involvement in the dominant socioeconomic system (Beauvais, 1998; Mancall, 1995; May, 1986). They vary, "in other words, from study to study" (Ledlow, 1992, p. 29). In addition to variation between native groups, the available research typically fails to account for differential enculturation within a given tribe or group of Native Americans.

Another major shortcoming involves the interpretation of traditionalism as an explanation of Native American deviance (which is largely a product of limited empirical research). According to Deyhle (1989), Native Americans who come from the most traditional homes, speak the native language, and participate most in traditional religious and social activities will suffer the most cultural dissonance and therefore partake in more deviance. Ledlow (1992) agrees, arguing that Native Americans from more traditional backgrounds, "according to prevailing assumptions, would experience the greatest cultural discontinuity" (p. 28). From this standpoint, those most attached to their native traditions suffer from the greatest conflict, and it follows that these Native Americans will evidence greater deviance.

Herring (1994) and Fredrick (1973) have a different take on traditionalism. Fredrick believes that the cultural gap leaves youth poorly attached to either Native American or White ways: "Young Indians grow up without a satisfactory identification either with their own heritage or with that of White

society" (p. 8). Herring also writes that a "lack of integration into either a traditional Native American Indian or mainstream society" (p. 585) is problematic and a precursor to deviance. According to this perspective, deviance is the result of poor native enculturation; therefore, embracing native traditions serves as a buffer against deviance (LaFromboise, Trimble, & Mohatt, 1990).

Among the few tests using measures of traditionalism, modest support has been found for each position. Chan and Osthimer (1983) and Oetting, Beauvais, and Edwards (1988) reported that those least attached to Native American culture were more likely to be deviant, whereas May (1982) found that youth who reported a strong native identification were less likely to use substances. Wood and Clay (1996) found that greater Native American blood quantum increased the likelihood of academic failure, whereas other measures of native heritage failed to influence in either direction. Novins and Mitchell (1998) found no significant association between the ethnic identity of Native Americans and marijuana use. Beauvais (1998) contends that studies applying native traditions as an explanation of deviance are largely inconclusive. Given the paucity of research on this issue, the nature of the native traditionalism-deviance relationship appears uncertain.

NATIVE AMERICAN SUBSTANCE USE

The most extensively studied area of Native American deviance pertains to substance use (Plunkett & Mitchell, 2000). In most every legal and illegal substance category, Native American youth report a higher rate of use than do their non-Native American counterparts (Beauvais, 1992, 1996, 1998; Beauvais & LaBoueff, 1985; Costello, Farmer, Angold, Burns, & Erkanli, 1997; Johnson, O'Malley, & Bachman, 1987; Novins & Mitchell, 1998; Oetting & Beauvais, 1990; Plunkett & Mitchell, 2000) and are more likely to be moderate or heavy substance users whether living on or off reservations (U.S. Senate Select Committee on Indian Affairs, 1985).

Native Americans report an inordinately high prevalence of smoking (G. G. Bachman, Wallace, & O'Malley, 1991; Kimball, Goldberg, & Oberle, 1996), in both rural and urban locations (Unger et al., 2003) and for both genders (Campos-Outcalt, Ellis, & Aickin, 1995), including the use of smokeless tobacco (Kerby, Brand, & John, 2003). Of little surprise, alcohol abuse is frequently associated with Native Americans (Duran & Duran, 1995; Mail & Johnson, 1993; Young, 1988), with consumption rates as much as 3 (May, 1986) to 10 (Hisnanick & Erickson, 1993) times higher than those among the general population and with reservations reporting higher levels than their nonreservation counterparts (Beauvais, 1992). Moreover, Native Americans

experience more negative consequences from drinking (Beauvais, 1998; Clark, 1996; Goldblatt, 1998), especially in terms of alcohol-related crime (Greenfield & Smith, 1999; Wakeling, Jorgensen, Michaelson, & Begay, 2001). Among illegal substances, marijuana use is particularly disproportionate for Native Americans (Beauvais, 1996, 1998; May, 1986; Young, 1988), with levels approaching (Oetting & Beauvais, 1990) or exceeding (Okwumabua & Duryea, 1987) alcohol use. Native American youth report a wider variety of use, which includes the mixing of drugs and alcohol, beginning use at a younger age, continuing use, and moving into heavier substances (Beauvais, 1992; Novins & Mitchell, 1998). Official statistics also suggest that Native Americans abuse a variety of substances at a disproportionate rate (Executive Committee for Indian Country Law Improvements, 1997) in spite of mass underreporting (Wakeling et al., 2001). The U.S. Indian Health Service calls substance abuse the number one health problem among Native Americans (Herring, 1994). Such findings on the current state of Native America have led Backover (1991) to suggest we are not merely referring to a generation at risk but a race at risk.

CULTURAL INVARIANCE AND TRADITIONALISM

In their four-nation comparisons of self-control theory, Vazsonyi and colleagues (Vazsonyi, 2003; Vazsonyi et al., 2001) report self-control as a predictor of deviance in each nation, but no distinct measures of cultural variation were included. Rather, the authors assume that nationality equates to cultural differences. The same is true for Vazsonyi and Crosswhite's (2004) racial comparison on samples within the United States, with cultural differences between Black and White respondents being assumed rather than tested. In much the same way, researchers investigating the role of native traditionalism tend to assume that Native Americans possess a culture distinct from other groups and that all Native Americans are equally enculturated into their heritage. But one of the most damaging critiques of research surrounding native traditionalism can also be leveled at research on self-control theory's cultural invariance thesis, namely, that it assumes distinct cultural differences but does not explicitly control for them. Though research on Native Americans provides reason to believe they differ culturally from their White counterpart, this charge seems relevant for Native Americans because a wealth of literature has established them as a highly heterogeneous group (Beauvais, 1998; Ledlow, 1992; Mancall, 1995; May, 1986). Therefore, it may be presumptuous to assume cultural difference (Ledlow, 1992; Ogbu, 1987) when examining the effect of self-control among Whites versus Native

Americans. Hence, we go beyond such an assumption to include distinct indicators of traditionalism that address the variability in attachment to native traditions among our Native American respondents. By doing so, we provide both a more discriminating test of self-control theory's cultural invariance thesis and a test of traditionalism as an explanation of Native American substance use.

DATA AND METHOD

The data for this study were collected by administering anonymous, confidential questionnaires to adolescents and young adults ages 15 to 21 attending Grades 9 through 12 at public high schools in six purposively selected school districts in Oklahoma. The schools were targeted geographically to maximize the number of Native American respondents and variation in tribal affiliation. For instance, efforts were made to ensure that a school district from within each of the five geographic regions of the state (i.e., central, northeast, southeast, northwest or panhandle, and southwest) was selected and that urban, rural, and mixed school districts were included. Oklahoma schools are well suited for such research because Native Americans are the largest racial/ethnic minority in the state. Moreover, given the primary purpose of the original project from which these data are derived (i.e., a study of racial/ethnic differences in the prevalence, incidence, and etiology of adolescent substance use and delinquency), specific attention was given to ensure adequate sampling of Native Americans.

Questionnaires were administered en masse by both research staff members and school officials to all students who were in attendance on the day of the survey, who had volunteered to participate and who also had obtained written parental permission. Attrition from this combination of voluntary participation and parental permission, along with absenteeism on the day of the survey, reduced the proportion of students who completed the questionnaire to approximately 43% of the total enrollment at the schools sampled (response rates varied among participating schools). This response rate is similar to that reported by other researchers who have adopted the stringent requirements of voluntary participation and parental permission required by both school officials and the institutional review board's policy regarding protected groups in human participants research (Cochran, Wareham, Wood, & Arneklev, 2002; Cochran, Wood, Sellers, Wilkerson, & Chamlin, 1998; Radosevich, Lanza-Kaduce, Akers, & Krohn, 1979). Demographic comparisons of our sample with the general enrollment population of the schools targeted suggest that our sample somewhat underrepresents males (44.4% vs.

48.9%) but that the racial mix is quite proportionate (20.2% Native American and 9.7% Black vs. 22.1% and 9.2%). After deleting Black respondents, we concluded with 1,122 White and 382 Native American respondents in the sample. (All demographics are self-reported in our sample.)

We begin by comparing the self-control and substance use of Native American and White youth in our sample. We then regress each substance use category (tobacco, alcohol, marijuana, and other drugs) on self-control. This regression is a combined race examination to see if self-control predicts substance use when controlling for race (as a preliminary signifier of culture) using a dummy variable. Next, we run separate, race-specific regressions to see if self-control equally predicts substance use for each race. Finally, we focus on the Native American sample with self-control as a predictor of substance use while controlling for variations in native traditionalism. This last analysis explicitly tests the cultural invariance of self-control. A second feature of this final analysis is the use of native traditionalism measures to predict substance use when controlling for the effects of self-control.

Independent Variables

We employ the Grasmick et al. (1993) 24-item self-control scale. Because it is the most widely used measure of self-control and has been established as valid and reliable (Nagin & Paternoster, 1993, 1994; Piquero & Tibbetts, 1996), it appears to be the reasonable choice for a test of cultural invariance and as a predictor of Native American substance use. Each item is measured using 4-point, Likert-type response options ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The scale is operationalized according to six dimensions—immediate gratification, simplicity, risk taking, physicality, anger, and self-centeredness—made up of four indicators each. Whether self-control is best conceptualized as a uni- or multidimensional construct is debated. Piquero and Rosay (1998) found evidence for a unidimensional trait, but others found multiple dimensions (Arneklev, Grasmick, & Bursik, 1999; Grasmick et al., 1993; Longshore, Stein, & Turner, 1998; Longshore, Turner, & Stein, 1996; Vazsonyi et al., 2001). These empirical differences may not translate to a theoretical difference, however. Gottfredson and Hirschi (1990) describe self-control as a function of multiple (six) dimensions coming together in the same individual. As explained by Vazsonyi and Crosswhite (2004), the notion of a unidimensional trait composed of various subdimensions is consistent with other psychometric constructs even if the subdimensions predict deviance differentially. Based on this logic, we would expect evidence of a single trait composed of six dimensions.

As a measure of native traditionalism, we employ a nine-item native attachment scale borrowed from Scott (1986) and developed with assistance from a group of midwestern Native Americans. This scale is consistent with the recommendations of Willetto (1999) and Morris et al. (2002), who promote indicators that are not bound to the specific practices of particular Native American tribes but are more generic and applicable across this heterogeneous group. The native attachment scale includes items such as the importance of speaking the native language, having a Native American name, belonging to Native American organizations, learning Native American studies, and so forth. Responses on the individual items range from 1 (*strongly disagree*) to 4 (*strongly agree*), with a higher score representing greater attachment to native traditions. This scale is relevant only to our Native American respondents and is used as both a predictor of their substance use and a means of controlling for variation in culture when testing self-control. Individual scale items and corresponding descriptive statistics are presented in Appendix A.

Dependent Variables

Substance use is measured according to four categories: tobacco, alcohol, marijuana, and serious drug use. The final category refers to any of a number of substances: cocaine, crack, speed, downers, heroin, LSD, or angel dust (PCP). Marijuana use also includes the use of hashish. Tobacco includes cigarettes and chewing tobacco. Respondents report the number of days they have imbibed in the past 4 weeks. Responses range from 0 to 28. Complete indicators and descriptive statistics are presented in Appendix A.

Control Variables

We control for the demographic influences of age, gender, and race (where applicable) because of the emphasis placed on them by Gottfredson and Hirschi (1990). As noted by the authors, these are the three most influential correlates of crime and delinquency, and self-control should remain a significant influence independent of them. Age ranges from 15 to 21, with a fairly normal distribution and a mean age of just older than 17. This is largely true for the combined race sample and each race. When the races are combined, 56% of the sample is female, and 44% is male. For purposes of our regression analyses, sex is coded as 0 (female) and 1 (male). As with age, the distribution by sex is fundamentally the same for each race. As noted above, we begin our analyses with 1,122 White and 382 Native American respon-

dents. Race is coded 0 (White) and 1 (Native American) in our first set of regression models.

RESULTS

We first check the reliability of our self-control scale for the combined race data and separately for each race. The 24 items are reliable for the combined race ($\alpha = .876$), Native American ($\alpha = .878$), and White ($\alpha = .874$) data. In each instance, removing any of the indicators reduces the Cronbach's alpha and therefore the reliability of the scale (see Appendix A for details on exploratory factor analysis [EFA] and reliability analyses). EFA reveals a clear break in magnitude after the first factor when the races are combined and separately for both Native American and White respondents. Following the scree discontinuity test, such a break represents a unidimensional latent concept. The results also indicate six eigenvalues, suggesting the existence of six underlying dimensions for each race (Nunnally & Bernstein, 1994). Consistent with previous studies (Arneklev et al., 1993, 1999; Grasmick et al., 1993; Longshore et al., 1996, 1998; Miller & Lynam, 2001; Piquero, MacIntosh, & Hickman, 2000; Piquero & Rosay, 1998; Tittle et al., 2003; Vazsonyi & Crosswhite, 2004) and theoretical interpretation, we consider these results ample defense of a single scale, consistently applicable to our Native American and White respondents. Our self-control scales are produced by multiplying the regression factor score for each item by the z score for each individual and summing across items. All three scales (combined, Native American, White) have a mean of 0 and a standard deviation of 1. When the two races were combined, scores ranged from -2.53 to 3.21 . For Native Americans the range was -2.60 to 3.00 , and for Whites the range was -2.52 to 2.94 . These scales are used in all regression analyses and are scored so that low scores equal low self-control.

Applicable only to the Native American respondents, reliability analysis on the nine native attachment items reflects a single scale ($\alpha = .836$); deleting any of the items reduces the alpha. EFA on our nine native attachment indicators produces a single factor of magnitude (4.021); hence, both results support the inclusion of all nine items into a single scale. Though few of our Native American respondents reside on traditional tribal lands, the raw mean score of their native attachment (additive scale in Appendix A) suggests a reasonably strong degree of traditionalism, comparable to previous studies using similar measures on members of a Southwestern reservation (see Morris et al., 2002). Using the same factor score method that produced our self-control scales, the traditionalism scale has a mean of 0, a standard deviation of 1, and ranges from -3.24 to 1.95 .

We also construct an additive self-control scale for the purposes of comparing raw mean scores by race. As revealed in Table 1, Native Americans register lower self-control compared to their White counterparts. Though the difference is statistically significant, the magnitude of difference is less than impressive. Table 1 also compares the substance use means by race. Most studies on Native American substance use report disproportionately high rates; others have argued that drawing such a conclusion is premature (Lester, 1999; May, 1982; Young, 1988). But most also fail to use matched samples or test differential rates for statistical significance (Lester, 1999; Plunkett & Mitchell, 2000). We do both, and our results show that our sample of Native Americans report greater use in each substance category, though only in the cases of alcohol and serious drug use did the racial difference reach statistical significance. We also observed a common trend, with the incidence of use being highest for tobacco and lowest for serious drugs regardless of race. The distribution of self-control and substance use scores (Appendix A) is sufficient and similar by race, allowing for comparison in multivariate analyses.

Turning our attention to the multivariate analyses, we first regress each substance on self-control, controlling for age, gender, and race. Standardized ordinary least squares (OLS) coefficients (β) are reported in Table 2. The most prominent finding is the significant influence of self-control on each substance, controlling for age, gender, and race. Moreover, being Native American significantly influences only serious drug use. If we preliminarily consider race as a signifier of culture, these findings bode well for the cultural invariance claims of self-control.

Next, we run separate OLS regressions for each race. The standardized coefficients are reported in Table 3. The first column under each substance heading refers to White respondents. The results for Native Americans are reported in the second and third columns—the third column includes our native traditionalism measure. To determine whether self-control equally predicts substance use for each race, we compare the first (White) and second (Native American) columns under each substance. The results are largely similar to the previous analysis. Although our model explains a greater amount of the variance of Native American substance use, self-control significantly predicts each form of substance use for both races, suggesting preliminary support for the cultural invariance thesis. Nevertheless, it is also true that the effect of self-control is greater for Native Americans across all substance use categories. Therefore, we test these racial differences in self-control for statistical significance using the method suggested by Paternoster, Brame, Mazerolle, and Piquero (1998). Reported near the bottom of Table 3, z scores show that the magnitude of the racial difference in the effect of self-control on substance use is statistically significant ($p < .05$) for both mari-

TABLE 1: Raw Mean Scores for Self-Control and Substance Use

	Self-Control		Tobacco		Alcohol		Marijuana		Serious Drugs	
	M	n	M	n	M	n	M	n	M	n
Native American	61.250	364	7.03	368	3.52	368	1.55	367	0.80	366
White	63.791	1,058	6.33	1,099	3.09	1,101	1.29	1,102	0.46	1,105
<i>Statistical Significance (t Test) of the Differences in Mean Scores</i>										
Native American/White	.001		.385		.025		.103		.000	

TABLE 2: Standardized Ordinary Least Squares Coefficients—Self-Control on Substance Use (Combined Races)

	<i>Tobacco</i>	<i>Alcohol</i>	<i>Marijuana</i>	<i>Serious Drugs</i>
Self-control	-.25**	-.33**	-.20**	-.15**
Age	.08**	.11**	.08**	.03
Male	.05	.04	.01	.03
Native American	.01	.01	.01	.06*
R^2	.074	.122	.046	.029
Adjusted R^2	.072	.119	.043	.026
<i>n</i>	1,391	1,394	1,393	1,395

* $p < .05$. ** $p < .01$.

juana use and serious drugs.² This implies that self-control is significantly more predictive of Native American marijuana and serious drug use than of White use—which could be interpreted as a challenge to the cultural invariance thesis. More will be said of this issue in the concluding section.

In our focus on Native American respondents, we conduct a more stringent test of the cultural invariance of self-control than is available in the extant literature, and by extension we provide a test of native traditionalism as a predictor of substance use. Preliminary bivariate analysis (not reported) found that self-control and traditionalism are virtually unrelated ($r = -.09$) in our sample and are therefore appropriate as independent predictors of substance use. Comparing the second and third columns (Native Americans only) under each substance use heading, self-control remains a significant predictor even when controlling for native traditionalism. Such findings provide additional support for the claim that self-control is a culturally invariant predictor of substance use. Beyond the cultural invariance test of self-control, observe that higher scores on the native attachment scale are positively associated with each substance, which provides consistent support for one interpretation of the native traditionalism argument. We consider this finding particularly convincing given the significant influence when including self-control as a competing predictor. Nevertheless, the influence of low self-control on Native American substance use is of greater magnitude than is the influence of traditionalism.

DISCUSSION

Self-control is proposed as an explanation for all forms of crime, delinquency, and analogous behavior, even when controlling for age, gender, and race. Most significant to this study, self-control is theorized as a culturally invariant characteristic with the ability to predict misbehavior regardless of

TABLE 3: Standardized Ordinary Least Squares Regression Coefficients—Self-Control + Traditionalism on Substance Use

	Tobacco			Alcohol			Marijuana			Serious Drugs		
	White	Native American	White	White	Native American	White	White	Native American	White	Native American	White	Native American
Self-control	-.25**	-.26**	-.25**	-.33**	-.35**	-.34**	-.18**	-.27**	-.26**	-.12**	-.21**	-.20**
Age	.10**	.05	.06	.09**	.16**	.16**	.06	.13*	.12*	.00	.08	.07
Male	.04	.10	.11*	.01	.11*	.12*	-.03	.09	.10	-.01	.10*	.11*
Traditionalism		.10*	.10*		.15**	.15**			.15**			.14**
R^2	.073	.078	.097	.112	.153	.182	.033	.094	.119	.014	.062	.081
Adjusted R^2	.071	.070	.086	.109	.145	.172	.030	.086	.108	.011	.054	.070
n	1,038	352	341	1,041	352	341	1,041	351	340	1,044	350	339
z score		.12			1.42			1.97*			2.38*	

NOTE: z scores reflect differences in the influence of self-control by race (controlling for age and gender). The scores are calculated using standardized coefficients reported in Appendix B.
* $p < .05$. ** $p < .01$.

the group under study. Our research generally supports this claim. Native Americans reported low self-control compared to Whites. Self-control significantly predicted the frequency of use for each substance in our analyses. Self-control predicted substance use when controlling for racial differences, and self-control predicted Native American and White substance use in race-specific analyses. Most significantly, the influence of self-control on Native American substance use remained even when native traditionalism indicators were included. In sum, self-control is a predictor of substance use when taking into consideration racial and cultural variability among our sample of Whites and Native Americans.

We would note, however, that one might also interpret our findings as somewhat inconsistent with the cultural invariance thesis because the effect of self-control on marijuana and serious drug use is significantly greater among Native Americans as compared to Whites. If, as Gottfredson and Hirschi (1990) claim, "the important correlates of crime do not vary across culture" (p. 124), and if we assume (as they do) that self-control is one of those correlates, we would expect to find no significant group difference in the effect of self-control when comparing Whites and Native Americans. In light of our finding, however, consideration of sociodemographic and/or cultural differences that might cause variability in the effect of self-control seems warranted. It appears plausible that self-control differentially influences at least certain types of substance use, which goes against the generality argument posited by Gottfredson and Hirschi. The question as to why self-control is a better predictor of certain substances among Native Americans is a difficult one given the number of possible implications. In a review of substance use causality, Herring (1994) notes that Native Americans are exposed to more risk factors, including numerous economic, educational, familial, and social risk factors, than are other ethnic groups. With such an array of possibilities, we are hesitant to guess which of these factors might best explain this differential influence of self-control. In the meantime, we suggest the cultural invariance thesis may require revision to allow for some degree of cultural variation while maintaining the claim that self-control will generate a significant effect regardless of racial or cultural affiliation.

A related issue is the magnitude of effect of self-control. For both races, the regression coefficients and explained variance are moderate if not low, well short of the bold claims made by Gottfredson and Hirschi (1990). For models that did not include traditionalism, the explained variance ranged from about 15% (Native American alcohol use) to as low as 1% (White serious drug use). We are not the first to recognize the relatively mild influence of self-control, especially when controlling for other explanations (Pratt & Cullen, 2000; Unnever, Cullen, & Pratt, 2003) as we have done here.

As for the effects of native traditionalism on substance use, attachment to native traditions increased substance use in all four categories, even when controlling for the influence of self-control. Interpreting this finding is less straightforward, however. Research on traditionalism openly rejects the notion that something inherent in native traditions encourages deviance (Beauvais, 1998; Beauvais & LaBoueff, 1985; Herring, 1994; Ledlow, 1992; Ogbu, 1987; Query, 1985). We also reject this notion and instead side with the thesis that those most attached to native traditions suffer from some sort of cultural dislocation because of their simultaneous exposure to White society (Bynum, 1987; Dana, 1993). This interpretation appears most plausible given our particular sample of Native American youth, gathered in White-dominated public high schools. If nothing else, our findings challenge the view that a strong attachment to native traditions serves as a defense against substance use or that traditionalism is unrelated.

Nevertheless, the magnitude of influence on substance use is relatively small, notably less than self-control. Coupled with the lack of empirical research on traditionalism and the related paradigmatic debate, we believe that these findings are best viewed in this context. What appear to be needed are additional interpretive variables that might better explicate the role played by traditionalism. Nonetheless, we consider our analyses a compulsory step by directly testing traditionalism rather than assuming its influence, as previous interpretations tend to do.

Among the potential shortcomings of our study, at least two involve the limited number of variables. Although Native Americans displayed lower self-control, our analysis does not include any predictors of self-control. According to Gottfredson and Hirschi (1990), inadequate parental supervision is the primary source of low self-control, with other familial variables such as number of siblings, biological parents, and mother working outside the home as influences. Our lack of such predictors is unfortunate given the association that has been demonstrated between laissez-faire childrearing practices and substance use among Native Americans (Herring, 1994) in addition to an overt lack of parental sanctioning against substance use (Oetting et al., 1988). We also lack measures of criminal opportunity. Gottfredson and Hirschi state that the form of deviance expressed by low self-control is dependent on opportunity. Extant research demonstrates high levels of substance use among Native Americans in a variety of settings, which infers greater opportunity for substance use. We recognize the role of such opportunity, especially in relation to the aforementioned familial variables. Hirschi (1994) and Lagrange and Silverman (1999) suggest that attentive parents better monitor their children, which can be expected to have a direct effect on offending. Regardless, we do not wish to detract from our

focus on the cultural invariance thesis, especially with regard to our explicit control for cultural variation while testing self-control. For now we consider our analyses and findings a worthy cultivation of this particular issue and encourage further research on the topic, which includes other appropriate variables.

Another limitation involves the chosen sample of Native Americans. Unlike most research on Native Americans, our sample does not reflect a reservation population. Except for a handful of respondents, the vast majority resides in nonreservation settings. However, we do not see this as a fatal flaw in our analyses. First, as stated previously, the degree of traditionalism reported by our respondents is similar to previous studies (Morris et al., 2002) using reservation samples. Moreover, Native Americans are by no means a homogenous group, and our measures of traditionalism capture the differences within our sample. Finally, little research has been done on Native Americans living off reservations (Lester, 1999), who account for roughly two thirds of the Native American population in the United States (Beauvais, 1998). Because of the heterogeneity of this ethnic group, both on and off reservation research is needed if we are to consider the various influences on Native Americans.

Finally, we are cautious in our conclusions because of our sampling procedure. School-based, self-report surveys are known to exclude adolescents who have dropped out and may be more deviant (Tracy, Wolfgang, & Figlio, 1990). Moreover, those with low self-control are less likely to complete our institutional review board requirements. In addition, the bulk of research surrounding the role of traditionalism implicates the school as a source of difficulties in cultural adjustment and dropping out (Ledlow, 1992). If this holds true, those most attached to their native traditions are more likely to have dropped out.

As Lester (1999) has pointed out, among the potential theoretical explanations of Native American deviance, sound research is relatively nonexistent. We address this void by employing what seem obvious theoretical choices. One is currently the most popular explanation of general criminality—self-control; the other relates to the most popular explanation of Native American impropriety—native traditionalism. We test these theories on substance use because of the weight of its concern in Native America (Plunkett & Mitchell, 2000). If each theory holds true, indoctrination into Native American culture should influence substance use, and self-control should predict substance use independent of variation in native traditionalism. Our findings provide qualified support for at least one interpretation of traditionalism. They also provide notable support for self-control theory's cultural invariance thesis as self-control registers a significant effect regardless of group affiliation and

when controlling for cultural variation, though again the significant differences by race (marijuana and serious drug use) suggest the invariance thesis may require revision. Moreover, the explained variance of each model is low by typical standards, raising questions about the magnitude of the influence of self-control. Additional work using samples and measures that reflect cultural variation and enhance the interpretation of the role played by traditionalism would seem warranted.

Appendix A Descriptive Statistics

	<i>Female (%)</i>		<i>Male (%)</i>	
	<i>Native American (NA)</i>	<i>White (W)</i>	<i>NA</i>	<i>W</i>
Gender	58.4	55.5	41.6	44.5
	M		SD	
	<i>NA</i>	<i>W</i>	<i>NA</i>	<i>W</i>
Age	17.2	17.1	1.12	1.03
	M		SD	
<i>About how many days in the past 4 weeks did you:</i>	<i>NA</i>	<i>W</i>	<i>NA</i>	<i>W</i>
Smoke cigarettes or chew tobacco.	7.03	6.33	11.01	10.88
Drink beer, wine, or liquor.	3.52	3.09	6.04	5.13
Smoke marijuana, pot, or hash.	1.55	1.29	5.31	4.84
Use drugs such as like cocaine, crack, speed, downers, heroin, LSD, or angel dust (PCP).	.80	.46	3.66	2.71
	M		SD	
Traditionalism			25.37	5.19
Attending pow-wows is an important part of American Indian lifestyle.			2.89	0.81
American Indian students should be knowledgeable about their heritage.			3.58	0.66
American Indians should learn to speak their native language/tongue.			3.02	0.88
More American Indians should attend Indian pow-wows.			2.80	0.86
It is important to belong to an Indian organization.			2.80	0.85
The American Indian medicine man is very important to American Indians.			2.67	1.02
American Indian studies are an important part of every Indian student's education.			3.08	0.86
American Indian parents should give their children Indian names.			2.06	0.91
What happens in my tribal community directly affects me.			2.45	1.00

(continued)

	M		SD		Factor Loadings	
	NA	W	NA	W	NA	W
	Self-control	61.25	63.79	12.32	11.87	
Risk taking						
I like to test myself every now and then by doing something a little risky.	2.93	2.96	0.94	0.93	.422	.448
Sometimes I will take a risk just for the fun of it.	2.80	2.78	1.03	1.05	.548	.579
I sometimes find it exciting to do things for which I might get in trouble.	2.47	2.42	1.09	1.10	.602	.609
Excitement and adventure are more important to me than peace and security.	2.29	2.14	1.02	1.00	.596	.634
Simplicity						
I frequently try to avoid projects that I know will be difficult.	2.55	2.51	0.97	0.99	.488	.464
When things get complicated, I tend to quit or withdraw.	2.08	1.99	0.98	0.91	.503	.426
The things in life that are easiest to do bring me the most pleasure.	2.41	2.21	0.99	0.96	.530	.505
I dislike really hard tasks that stretch my abilities to the limit.	2.19	2.09	1.00	0.93	.567	.470
Anger						
I lose my temper pretty easily.	2.49	2.37	1.11	1.11	.465	.479
Often, when I'm angry at people I feel more like hurting them than talking to them about why I am angry.	2.41	2.19	1.11	1.09	.615	.614
When I'm really angry, other people better stay away from me.	2.56	2.36	1.12	1.07	.508	.550
When I have a serious disagreement, it's usually hard for me to talk calmly about it without getting upset.	2.84	2.75	1.10	1.06	.432	.500
Self-centeredness						
I try to look out for myself first, even if it means making things difficult for other people.	2.38	2.29	1.00	0.94	.488	.533
I'm not very sympathetic to other people when they are having problems.	1.65	1.51	0.86	0.81	.382	.325
If things I do upset people, it's their problem not mine.	1.87	1.68	0.97	0.85	.468	.368
I will try to get the things I want even when I know it's causing problems for other people.	1.90	1.79	0.93	0.84	.626	.504

	M		SD		Factor Loadings	
	NA	W	NA	W	NA	W
Physicality						
If I had a choice, I would almost always rather do something physical than something mental.	2.78	2.68	0.96	1.03	.551	.474
I almost always feel better when I am on the move than when I am sitting.	3.03	2.95	0.97	0.98	.411	.506
I like to get out and do things more than I like to read or contemplate ideas.	3.19	3.23	0.97	0.91	.539	.457
I seem to have more energy and a greater need for activity than most other people my age.	2.76	2.65	0.89	0.91	.310	.342
Immediate gratification						
I don't devote much thought and effort to preparing for the future.	1.98	1.76	0.98	0.90	.533	.461
I often do whatever brings me pleasure here and now, even at the cost of some distant goal.	2.51	2.44	1.01	1.03	.569	.616
I'm more concerned with what happens to me in the short run than in the long run.	2.30	2.04	1.06	0.99	.558	.568
I much prefer doing things that pay off right away rather than in the future.	2.52	2.41	0.99	0.98	.552	.641

Appendix B
 Unstandardized Ordinary Least Squares Coefficients,
 Standard Errors, and z Scores—Self-Control on Substance Use

	Native American		White		z Score
	b	SE	b	SE	
Tobacco	-2.81**	.057	-2.73**	.329	0.12
Alcohol	-2.15**	.308	-1.67**	.151	1.42
Marijuana	-1.45**	.279	-0.83**	.144	1.97*
Serious drugs	-0.77**	.196	-0.28**	.073	2.38*

NOTE: The above coefficients are drawn from the equations in Table 3, which control for age and gender. z scores match those presented in Table 3.

* $p < .05$. ** $p < .01$.

NOTES

1. Marcus (2003, 2004) has recently commented on the limitations of existing measures of self-control, particularly the Grasmick, Tittle, Bursik, and Arneklev (1993) scale.

2. Derived from the equations reported in Table 3, this test employs the unstandardized regression coefficients and standard errors that are reported in Appendix B. The test compares the self-control coefficients in columns 1 (White) and 2 (Native American) when controlling for age and sex. For details on the test, please see Paternoster, Brame, Mazerolle, and Piquero (1998).

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