



Explaining the Association between Gender and Substance Use among American Indian Adolescents: An Application of Power-control Theory

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**EXPLAINING THE ASSOCIATION BETWEEN GENDER AND SUBSTANCE USE
AMONG AMERICAN INDIAN ADOLESCENTS: AN APPLICATION OF POWER-
CONTROL THEORY**

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CONTROL THEORY**

Abstract

This study evaluates the utility of Hagan's power-control theory for explaining substance use behaviors for a sample of American Indian adolescent males and females. Consistent with the theory, we found that patriarchal family form and the affective bond between father and daughter were significant predictors of female substance use behaviors. Compared to results from an analysis of non-Hispanic whites, these results reveal the importance of testing generalist explanations of deviant behavior across racial and ethnic groups. Our findings encourage a more in depth consideration of the gendered nature of work, its association with socialization and control in American Indian families, and its impact on gender differences in substance use and delinquent behaviors.

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A voluminous body of evidence has established that participation in crime and delinquency is gendered—males are more likely to participate in such acts and commit them at higher rates of frequency than females (Steffensmeier and Schwartz 2009; Giordano and Cernkovich 1997; Mears, Ploeger, and Warr 1998). Recent efforts to explain this gender difference have focused on establishing whether gender is associated with risk and protective factors predictive of criminal and delinquent behavior. One vein of scholarship has explored the nexus between structural arrangements that are gendered and the gendered nature of family socialization and control of children. This scholarship has drawn its inspiration from Hagan and colleague's power-control theory (Hagan, Gillis, and Simpson 1985; Hagan, Simpson, and Gillis 1987). The basic tenet of power-control theory is that authority (power) in the workplace is reproduced within the family—families in which the father is in a position of authority in the workplace while the mother is not tend to promote patriarchal-based socialization and control practices which increase the risk taking of boys and restrict such behaviors among girls. These gender differences in socialization and control predict differential involvement in crime and delinquency, since such behaviors are presumed to be associated with risk-taking.

Although empirical tests of power-control theory have enjoyed mixed results (e.g., Grasmick et al. 1996; Hagan et al. 1985; 1987; Hill and Atkinson 1988; Morash and Chesney-Lind 1991; Jensen and Thompson 1990; Blackwell 2000; Kobayashi, Sharp, and Grasmick 2008), the theory still holds intrigue because of its focus on how the gendered nature of work may ultimately explain the gender gap in crime and delinquency. Indeed, there are still questions

that may be best addressed by power-control theory. First, power-control theory has largely been tested with evidence compiled from non-Hispanic white samples (Jenson and Thompson 1990; Mack and Leiber 2005). We are aware of no extension of power-control theory to an American Indian sample, despite compelling reasons to examine the theory's utility in explaining gender differences in delinquent behaviors among American Indian adolescents. Second, few tests of power-control theory have examined its utility in understanding gender differences in substance use behaviors specifically, despite evidence that a gender gap in substance use may be relatively small or even nonexistent, compared to other forms of crime and delinquency (Johnston et al. 2001; Wallace et al. 2003). In the present study, we extend power-control theory to explain substance use behaviors among a sample of American Indians (and a control group of non-Hispanic whites) drawn from a nationally representative sample of students in the United States.

POWER-CONTROL THEORY

The central thesis of power-control theory is that occupational authority is associated with parental socialization and supervision patterns in the raising of boys and girls. Authority differences in the workplace, Hagan and colleagues argued, tend to produce distinctive family forms organized on the basis of authority in the household (Hagan et al. 1985). Patriarchal family forms emerge when the father has authority in the workplace while the mother either occupies an "obey" position in the workplace or is not employed in the public sphere. In such families (which Hagan and colleagues refer to as "unbalanced" family forms), mothers are charged with the primary socialization and social control responsibilities of the children, and are apt to promote traditional gender norms and expectations, including socializing girls to adhere to feminine, submissive roles that emphasize the characteristics of control and risk aversion. Boys are socialized to be risk takers, and relative to girls reared in such households, are given much

greater freedom. According to Hagan and his colleagues (1985, 1987), it is these differences in socialization regarding risk, coupled with the greater freedom that boys enjoy that likely contributes to a pronounced gender gap in crime and delinquency among boys and girls from such families.

The other family form—the balanced family—emerges due to the phenomenon of women’s increased participation in the workforce and the gains that women have made in the public workplace over the past few decades (Hagan et al. 1985; 1987). Such changes have led to women having workplace authority, which Hagan argued fundamentally changes the power differential in the family. In these families, boys and girls are raised in a much more egalitarian manner than in unbalanced families, with fewer gendered differences in socialization and control. Thus, the gender gap in crime and delinquency among children from balanced families would be smaller.

Tests of power-control theory have produced mixed results, although most tests have found support for many of its tenets (e.g., Hagan et al. 1985; Hill and Atkinson 1998; Singer and Levine 1988; Morash and Chesney-Lind 1991; Blackwell 2000). While this mixed support has led to efforts to revise or synthesize power-control theory (see Blackwell 2003 for a detailed discussion), one issue that may affect the utility of the model for understanding the gender gap is the type of the problem behavior examined. Hagan and colleagues suggested that the model would best explain involvement in “common delinquent behavior” (Hagan et al. 1985: 1161). Yet most tests of power-control theory have used measures that capture a “variety” of delinquent and criminal behaviors, which may obfuscate the nature of the association between the key explanatory variables and various types of delinquent or criminal behaviors. For example, a number of tests incorporate items capturing substance use into measures of delinquency (e.g., Uggen 2000; Blackwell and Piquero 2005; Blackwell 2000; Finckenauer, Weidner, and Terrill

1998), yet there have been no published studies that we are aware of that have applied power-control theory to only substance use behaviors.

THE GENDER-GAP IN SUBSTANCE USE

Despite the aforementioned gendered pattern of crime and delinquency, recent research has suggested that the gender gap in many forms of substance use/abuse has been converging. National trend data has suggested that adolescent male and female prevalence use rates for substances have converged over time (Johnston et al. 2001; Wallace et al. 2003; USDHHS 2001) with the gap in such behaviors as binge drinking, past month alcohol use (at least one drink), and cigarette smoking trending towards being negligible (Johnston et al. 2010). Additionally, there is considerable evidence that the gender gap in substance use grows wider as adolescents age—recent evidence suggested that 8th grade females were more likely to report using illicit drugs other than marijuana than their male counterparts (Johnston et al. 2012). However, gender differences in illicit drug use, including marijuana use still exist, with males reporting higher use than females and daily use rates for males exceeding twice that of females in high school (Johnston et al. 2012).

We argue that explanations that were specifically devised to consider the gendered nature of social life, such as power-control theory, have been under-utilized in exploring the gender gap in substance use. We found no published studies that have applied power-control theory formally to the gender gap in substance use behaviors specifically, although there have been studies that have explored elements included in power-control theory in order to understand gender differences in substance use behaviors. The gender gap in substance use behaviors has been linked to such power-control theory concepts/proxies as gender role orientations (e.g., Barrett and White 2002; Van Gundy et al. 2005) parental attachment/relational controls (e.g., Fagan et

al. 2011), instrumental/direct controls (e.g., Svensson 2003; Tyler, Stone, and Bersani 2006; LaGrange and Sliverman 1999), risk taking attitudes (Abbott-Chapman, Denholm, and Wyld 2008) and parental occupational status/authority (e.g., Stewart and Power 2003; Thompson 1989). Consistent with tests of power-control theory itself, this literature has produced mixed findings regarding the role that such factors play in explaining the gender gap in substance use.

AMERICAN INDIANS AND THE GENDER GAP IN SUBSTANCE USE

Although there exists considerable convergence in the substance use behaviors of American Indian teens generally, there are some notable issues. First, although evidence from the 2003 NSDUH survey (SAMSHA 2005; see also O'Connell et al. 2005; Beals et al. 2003) revealed that American Indians are less likely to have used alcohol in their lives, past year, or past month (relative to non-Hispanic whites), they suffer from much higher rates of binge drinking, abuse and dependence than whites (Young and Joe 2009; May 1995; Spicer et al. 2003; Manson et al. 2005). Additionally, American Indian illicit drug use rate exceeds that of other racial/ethnic groups in the United States, with marijuana being the drug most frequently used by American Indian youth (SAMHSA 2005; Young and Joe 2009).

But it is the gender gap in substance use among American Indians that is particularly provocative. In short, a number of studies have either failed to find a gender gap among American Indian adolescents in substance use behaviors, or have even reported the finding that females have higher substance use rates than their male counterparts. For example, Wallace and colleagues (2003) found that 12th grade American Indian females had the *highest* lifetime prevalence rates of any group, male or female, for the following substances: marijuana, Inhalants, Hallucinogens, Cocaine, Heroin, Stimulants, Tranquilizers, and alcohol. Studies among tribes from the Northern Plains and Rocky Mountains have found that alcohol use rates

among females approach the rates for the men (Spicer et al 2003; see Young and Joe 2009). Likewise, Walls (2008) found among a sample of 746 indigenous adolescents from the upper Midwest and Canada that the alcohol and marijuana use rates among males and females either did not differ or females exceeded the rates of males. Similarly, Heavyrunner-Rioux and Hollist (2010) found that among 1341 Native American students, females were more likely to report substance use than males. However, other studies have found that Native American males are more likely to be involved in substance use behaviors, relative to females (e.g., Hermann-Stahl and Chong 2002; Morris, Wood, and Dunaway 2006; Ehlers et al. 2004).

Despite contrary findings, considerable evidence has suggested a convergence of the gender gap in substance use behaviors among American Indians, explanations for these patterns among American Indians is largely missing. This is not particularly surprising, since, as noted by Morris and Wood, “criminology has long neglected indigenous minorities” (2010: p. 248). Overall, very few efforts have been made to extend generalist explanations of crime and deviance, like power-control theory, to American Indians.

Despite the mixed support for power-control theory when applied to non-Hispanic white adolescents, the model may have utility in explaining American Indian female substance use. First, American Indian families are recognized as being more egalitarian than other racial groups in America, due to a number of cultural, historical and structural experiences. Although many American Indian tribes practiced some gendered division of labor prior to the exposure to Europeans (Shoemaker 1995), American Indian women were often viewed as having a complementary rather than subordinate position to men, (Shoemaker 1995). Women typically played a very fundamental role in the economy of American Indian tribes, often having responsibility for growing and harvesting crops (Ackerman 1971). While American Indian

women declined in economic power as American Indians were subjected to genocide, oppression, and marginalization, the resultant isolation and poverty experienced by many American Indians served, in an odd way, to reduce the likelihood that males in the American Indian family would enjoy a dominant position in the economy. Similar to the experience of African-American families, American Indian male unemployment and underemployment has served to produce more egalitarian families (relative to whites).

In summary, there are compelling reasons to extend power-control theory to the gender gap in substance use behaviors generally, and to American Indians specifically. Additionally, we test the basic tenets of power-control theory with a control group of non-Hispanic whites, since few direct tests of power-control theory have specifically focused on the gender gap in substance use behaviors for any racial group. Drawn from power-control theory, we expect that measures of instrumental and relational control, risk-taking/avoidance, and patriarchal family form will each serve to explain substance use behaviors for both males and females.

DATA AND METHODS

This study utilizes restricted use data from Waves I and II of the National Longitudinal Study of Adolescent Health (Add Health) (Harris 2009). Add Health is a nationally representative study of adolescents (7th-11th grade in 1994 when the study began; Wave II data was collected in the following year). The Add Health sample is representative of schools in the US with respect to region, urbanicity, school size, school sector, and racial composition (Harris et al. 2009). For our American Indian sample (N=379), we selected adolescents from the wave I in-home sample based on the following criteria. First, we selected those respondents who indicated that their racial/ethnic identity was American Indian and that they resided in a household with two parents present (either two biological or adopted parents, or a parent and

stepparent). Second, we selected only those respondents who participated in both of the first two Waves of the in-home interview and for whom a valid Wave II sampling weight was available. Third, we selected only those students who answered the questions about substance use behaviors in the survey. Finally, we excluded respondents for whom we could obtain no measure of occupational prestige (approximately 2.9 percent of American Indian cases and 1.7 percent of non-Hispanic white cases). We selected non-white Hispanic respondents in the same manner (N=4924). All measures used in the analyses were measured at Wave I (missing values on the independent variables were replaced using a multivariate regression estimation procedure), with the exception of the dependent variables, which were measured at Wave II in order to reduce concerns about temporal ordering. All analyses use the appropriate weights, which account for design effects and attrition between Waves I and II.

Measures

We examined three different measures of substance use behaviors: alcohol consumption, marijuana consumption, and alcohol problems. Each of the three measures were count variables, indicating the number of times the respondent reported using marijuana in the past year (*marijuana consumption*), the number of times the respondent consumed alcohol in the past year (*alcohol consumption*) and a count of problems due to alcohol use (*alcohol problems*; see Appendix A for items that comprised the count measure).

In order to test the merits of power-control theory, we included the following measures in the analyses: maternal relational control, paternal relational control, maternal and paternal instrumental control, parental instrumental control, patriarchal family form and risk taking/aversion. We measured these variables based on prior tests of power-control theory using the Add-Health data (Mack and Lieber 2005) when consistent with the theory. The two measures

of *relational control* (maternal and paternal) were constructed using six items that assessed the degree of attachment or emotional closeness between the parent and the child. The resulting additive scales exhibited high reliability ($\alpha=.74$ for maternal; $\alpha=.78$ for paternal). *Instrumental control* was measured by a single item asking the respondent how often the parent was home when the youth returned from school. *Parental* (not specific to one parent) *instrumental control* was captured by a single item asking whether the parents let the respondent make his/her own decisions about the time he/she had to be home on weekend nights. *Risk taking* was captured by an additive scale comprised of four items asking respondents about their risk taking nature. While this measure is not an ideal construct to capture power-control theory's notion of risk taking, Mack and Leiber (2005) did find that this measure was a significant predictor of the dependent variable in their analyses. This additive scale exhibited high reliability ($\alpha=.74$).

A central tenet of power-control theory has been that the relative workplace authority of fathers and mothers is associated with the patterns of gender socialization and control exercised in the family. Unfortunately, there were no explicit measures of workplace authority available in the Add-Health data. However, respondents did report the occupations of their resident parents and we derived measures of occupational prestige from these reports. As noted by Hadjar and colleagues in their test of the tenets of power-control theory, Weber (2003) posited that occupational prestige is linked to authority in the workplace (Hadjar et al. 2007: 40). Because the Add-Health data utilized the broad occupational categories from the 1990 Census codes, we assigned the occupational prestige scores calculated by Nakao and Treas (1989) to the respondents residential parents.¹ Unfortunately, any parents who were categorized (in the Add-Health data) as military or security (Census categories) were not assigned a prestige score in the Nakao and Treas scheme. A parent who was not employed was assigned a zero on the

occupational prestige score. Finally, we coded those parents where the father (or stepfather) scored higher than the mother (or stepmother) on the occupational prestige score as a patriarchal family form with all other families being coded as egalitarian.

We also included three measures to capture family structure and family functioning. *Family structure* is a simple dummy variable indicating whether the respondent resides with their biological (or adoptive) parents versus living with a parent and stepparent. We also include a measure of *number of siblings* living at home, since greater numbers of children may dilute the control abilities of parents/adults. In addition to these measures, we also control for *mother's alcohol use*, based on the parent's report (most often the mother or mother figure), and *underclass*, based on the parent's response to five questions capturing whether the family had received public assistance, food stamps, a housing subsidy, or government assistance during the past month. Finally, *gender* is captured as a dummy variable based on the self-report of the respondent (female=1) and we also include *age* as a control variable. Appendix A provides the items included in key measures used in the analyses.

Analysis Strategy

The three dependent variables were all count variables and so we utilized negative binomial regression analyses.² In order to test for significant gender differences in the effect of the predictor variables on the dependent variables, the post-estimation command in Stata 12 for seemingly unrelated estimation (suest) was used, and a Wald test was conducted for each predictor testing the $H_0: \beta_{X_{Males}} = \beta_{X_{Females}}$ (StataCorp 2011). The results of these post-estimation Wald tests are reported in the results section.³

(Table One about here)

RESULTS

Table 1 presents the means for American Indian males and females on the measures included in the analyses. There were very few statistically significant differences in the means across males and females, with a few notable exceptions. First, there was a pronounced gender difference in the two measures of relational control, with American Indian females reporting weaker affective ties to both mothers and fathers, relative to American Indian male adolescents. This finding that adolescent females have *weaker* affective ties (relational control) than their male counterparts may help explain why there were no gender differences in risk taking or substance use behaviors among AI boys and girls, since Hagan asserted that risk taking gender differences emerge, in part, due to girls being socialized to develop stronger affective ties to others, including parents (see also Gilligan 1982). Second, females were subjected to greater parental instrumental control than males, a finding that is consistent with the basic tenets of power-control theory. However, boys were subject to greater *paternal* instrumental control than girls. Overall, the lack of a consistent pattern of gender differences in parental controls (relational and instrumental) suggested that American Indian adolescents may be reared in a relatively balanced manner, wherein one would expect a small gender gap in substance use (if power-control theory is valid). Indeed, none of the gender differences in the three measures of substance use were statistically significant, indicating that there was not a gender gap in substance use.

Table 2 presents the results of negative binomial regression models estimating the association of the predictors and the three dependent variables for American Indian males and females separately. In the first set of models (alcohol consumption, or the number of alcohol drinks in the past year), we found little support for power-control theory when examining the

males-only model. Only one of the theoretically relevant measures, parental instrumental control, was a statistically significant predictor of alcohol use for AI males (controlling for other variables). As expected, parental instrumental control is associated with a decreased risk of alcohol consumption among males, with a one-unit increase in such control decreasing the expected number of drinks consumed by a factor of .251, holding all other variables constant. However, neither of the other measures of control, nor the measure of patriarchal family form was found to be a significant predictor of AI male alcohol use.

For the females, we found stronger support for the basic tenets of power-control theory in the model predicting alcohol consumption. Specifically, we found that two measures of parental controls—parental instrumental control and paternal relational control were significant predictors of alcohol consumption for females, in the direction predicted by power-control theory. For instance, paternal relational control was associated with decreased alcohol consumption, with a one unit increase in paternal relational control associated with a decrease in the number of alcoholic drinks consumed by a factor of .132, holding all other variables constant. Despite prior research documenting the importance of same gender parental-adolescent attachment (e.g. Rossi and Rossi 1990), these results suggested that a close affective bond between father and daughter served as an important protective factor associated with less alcohol consumption among AI adolescent females.

But perhaps the strongest evidence in support of power-control theory was be found in the gender difference in the association of the measure of patriarchal family form on alcohol consumption. While our measure of patriarchal family form was not significantly associated with male alcohol consumption, living in a household characterized by a patriarchal family form served to significantly reduce female alcohol consumption, with females living in such families

being associated with a decrease in the number of alcoholic drinks consumed by a factor of .166 (holding all other variables constant). This finding was wholly consistent with the basic tenet of power-control theory, which has suggested that under patriarchal family forms, females will be socialized into adopting traditional gender norms and subjected to greater controls—both of which should serve to reduce alcohol consumption.

(Table 2 about here)

A similar pattern of findings was adduced when the dependent variable was marijuana consumption. For males, living in a family household with 2 biological (or adoptive parents) and two measures of instrumental control—paternal and parental instrumental control—both served to reduce marijuana consumption (*ceteris paribus*). For females, a number of variables were significant predictors of the dependent variable. Two of the measures of control served to reduce marijuana consumption—paternal relational and paternal instrumental control, while risk taking served to increase marijuana consumption (as expected). Somewhat unexpectedly, being a member of the underclass was associated with a *reduction* in marijuana consumption, holding all other variables constant. Although speculative, it may be the case that these adolescents classified as underclass experienced such deprivation that they may be financially limited in their ability to gain access to marijuana. But arguably the most provocative finding was again the role of patriarchal family form. As predicted by power-control theory, females living in a patriarchal family form were expected to engage in less marijuana consumption.

Exploring the third substance use measure—alcohol problems—we again found some support for power-control theory. For males, being older, living with more siblings, and *increased* paternal instrumental control was associated with more alcohol problems, while living with both biological (or adaptive) parents was associated with fewer alcohol problems. The

finding that paternal instrumental control was positively associated with alcohol problems was unexpected, but one possible interpretation is that paternal instrumental control may be associated with an paternal authoritarian punishment style; such parenting styles have been found to be associated with increased delinquent activities among male adolescents (Loeber and Stoutamer-Loeber 1986; see also Vermeersch et al. 2008).

For females, there were three variables that were significant predictors of alcohol problems—parental substance use, paternal relational control and patriarchal family form. Parental substance use was associated with increased alcohol problems and consistent with the power-control theory residing in a patriarchal family form and a strong, affective tie between daughter and father (paternal relational control) were also associated with fewer alcohol problems.

To follow up on the gender differences revealed in the above analyses we conducted post-estimation cross-model hypothesis tests to identify which coefficients were significantly different by gender. We found little evidence that the strength of the coefficients were significantly different across the two groups—with the exception of one coefficient. Patriarchal family form did enjoy a different association with each of the three substance use behaviors for AI females versus their male counterparts (Wald test statistic= 4.99, 3.18, and 9.46 for alcohol consumption, marijuana consumption, and alcohol problems models respectively).

For additional comparison purposes, we also mirrored our analyses predicting AI substance use behaviors with the sample of non-Hispanic whites. These findings available upon request. The pattern of results suggested important differences emerged in the utility of power-control theory for non-Hispanic whites relative to AIs. While the measures of relational and maternal instrumental control largely conform to the expectations gleaned from power-control theory, the

core measure, patriarchal family form, displayed a surprising association with the substance use measures in two of the three sets of models. For both marijuana consumption and alcohol problems, females residing in a patriarchal family form were predicted to experience *greater* alcohol consumption and alcohol problems, controlling for other variables. Indeed, Wald tests of racial differences confirmed that the associations between patriarchal family form and each of the three substance use measures were significantly different by race for females.

CONCLUSIONS

The purpose of the present study was to extend prior research and explore the efficacy of power-control theory as an explanation for the gender gap in substance use behaviors. Prior research testing the merits of the theory have produced mixed results (e.g., Grasmick et al. 1996; Hagan et al. 1985; 1987; Hill and Atkinson 1988; Morash and Chesney-Lind 1991; Jensen and Thompson 1990; Blackwell 2000), but criminologists remain intrigued by the theory due to the potential for such a theory to help link gendered changes in the workplace to child rearing practices at home. Because prior research has focused largely on samples of non-Hispanic whites, we posited that the theory has not been fully evaluated. Indeed, our working thesis is that power-control theory may help explain the lack of gender differences among AI adolescents in substance use behaviors. In general, we found consistent, albeit it limited support for the core propositions of power-control theory. Our findings make a contribution to understanding how gender relations influence male and female deviant behaviors, both by testing power-control theory with a novel population (American Indians) and by examining substance use behaviors specifically. While our results do not resolve the failure to find unequivocal support for the merits of power-control theory, these findings do demonstrate that power-control theory may still

provide a provocative explanation for female deviant behavior, especially when extended to unexplored groups and/or behaviors. We elaborate on our findings below.

First, among AI females our measure of patriarchal family form was found to be a robust measure of female substance use behaviors, in the expected direction. Our findings supported the notion that adolescent females raised in a “balanced” family form, wherein mother and father had relatively similar levels of workplace authority/prestige, served to increase substance use behaviors among females (controlling for other variables). Being reared in a patriarchal family form was associated with greater substance use consumption by males (compared to females), and less consumption by females. Conversely, boys and girls reared in balanced families converged in their substance use behaviors. With regards to the specific types of controls (i.e., relational and instrumental), we found less support for power-control theory, but the pattern of significant findings was consistent with the tenets of Hagan’s theory. Perhaps the most provocative finding with regards to these measures was the finding that only paternal relational control was a significant predictor of female substance use. While gender socialization theory posits that fathers will have a greater influence on sons (due to comparative advantage, greater internal rewards, and/or higher external expectations for socializing sons relative to daughters; Carlson 2006; pg. 139), the limited evidence has shown that father involvement was as important for daughters as it was for sons (Amato and Gilbreth 1999; Carlson 2006). The present study provides further evidence to support the notion that a close, affective bond between father and daughter is important for curbing adolescent substance use among females generally. However, we are aware of no prior studies that have found a protective role for the paternal-daughter affective bond; indeed, there have been few studies that examined the relationship between AI fathers and daughters (for an exception, see Reinhardt, Evenstad, and Faircloth 2012). Additional

research is needed to comprehensively explore the role of the father-daughter relational bond in influencing AI adolescent behavior generally.

Limitations and Future Directions

To the best of our knowledge, this study represents the first study to test the merits of power-control theory with a sample of AI adolescents. Despite the provocative nature of our findings, there were limitations that should be considered. First, although the Add Health data are a nationally representative sample of schools and students, the sample's strength is also its weakness. We cannot assess regional or tribal-related variation in substance use behaviors among our sample of AIs, which is a limitation given that past research has suggested that such variations are important (Whitesell et al. 2012; Young and Joe 2009). Given that there are 565 federally recognized tribes and many more tribes that are not so acknowledged by the United States, each with their own unique cultures and experiences, readers should be cautious in interpreting these results as applicable to every tribe or reservation. Additionally, this study cannot evaluate the role of culture and cultural traditions in understanding AI substance use, which likely is an important omission in understanding AI adolescent behaviors, including substance use (O'Neil and Mitchell 1996).

Likewise, some of our measures restricted our ability to fully test the aforementioned theses. Most notably, our measure of patriarchal family form was far from ideal, and a more precise measure of whether parents were in a command or obey position in the workplace may have produced different results. Additionally, some of our measures of the various controls posited by power-control theory were constructed from a limited number of items. More comprehensive measures may reveal differences not detected in the current study. We echo the sentiments of Mack and Leiber (2005), who noted that the ideal method to test the merits of power-control

theory (for any group) would be to “compare male and female sibling pairs to determine if there are differences or similarities in socialization, supervision, and risk taking by gender within individual families” (p. 139). Qualitative research could augment and compliment the findings uncovered by the present study and further explore the nature of gender relations in the workplace and household and how such relations influence substance use behaviors of American Indian adolescents. We also limited our examination to power-control theory and did not address alternative explanations of the narrow substance use gap between American Indian males and females. For instance, the role of stress exposure may also account for the lack of stark gender differences in some substance use behaviors (e.g., Vaccaro and Willis, 1998). Additionally, American Indian females are known to be at much greater risk of rape and sexual assault than the average American (Perry 2004; Malcoe, Duran, and Montgomery 2004; Beals, Klein, and Croy 2005), with such traumatic experiences being an established correlate of substance use problems (e.g., Kilpatrick et al. 2003). Despite these limitations, we suggest that our findings do add to our understanding of the correlates of American Indian adolescent substance use, and contribute to the larger literature exploring the merits of power-control theory for understanding gender-specific behaviors.

Ideally, our research will inspire other tests of power-control theory beyond examinations using non-Hispanic white samples with a focus on generic criminal activities. If we had used the traditional, non-Hispanic white sample (Appendix B) to test power-control theory, we would have reached a different conclusion about the potency of this theory to explain substance use behaviors for males and females. While not the focus of the present study, our research nonetheless demonstrates (again) the importance of testing generalist explanations across various racial groups as recommended by Cernkovich, Giordano and Rudolph (2000), who wrote 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.

One question that we have left unanswered is the question of why patriarchal family form served to increase marijuana consumption and alcohol problems among white females? While speculative, we suggest that in contemporary America, with middle class Americans feeling the squeeze of increased costs and flat earnings, patriarchal family forms, in which the mother either is in an obey position (which likely equates to a low paying job) or is unemployed, may simply be burdened with greater financial strain in their day-to-day lives. Such strain will be experienced by all family members and therefore, it may be stress that is driving substance use (as a coping method) rather than gendered differences in socialization and control. Additional research that can adjudicate between the two explanations (social stress versus power-control theory) is needed to address this question for non-Hispanic whites.

Additional research should further explore the role of gendered relations in American Indian adolescent substance use behaviors, with a focus on differing types of substances and related behaviors (beyond what was explored in the present study). Prior research suggests that American Indians are at a heightened risk of polysubstance use (relative to other groups, SAMHSA 2005)—do gender differences exist and what role does family structure and family control play in explaining such behavior? Furthermore, a common explanation for the greater rates of tobacco use among American Indian adolescents is the cultural and ceremonial role that tobacco plays in American Indian heritage (e.g., Eichner et al 2005). Again, power-control theory may be useful in exploring how gendered relations and social control influences tobacco use among males and females. And finally, further research into the role of non-parental adult

caregivers is also warranted, especially when considering gender differences in involvement in deviant behaviors. Limited evidence has suggested that non-parental caregivers play a somewhat unique role in many American Indian families, and that the presence of such adults can reduce substance use behaviors among adolescents (Beebe et al. 2008), yet we know relatively little about how such adults influence adolescent substance use activity, or the role that such caregivers may play in understanding gender differences in substance use behavior.

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Power-Control Theory & American Indian Adolescents

Table 1: American Indian Adolescent Difference of Means (Males: n=192; Females: n=187)

	American Indian Males	American Indian Females	Wald χ^2
<i>Dependent Variables</i>			
Alcohol consumption	102.13 (26.05)	120.42 (45.36)	.13
Marijuana consumption	12.80 (8.71)	5.10 (1.89)	.74
Alcohol problems	.76 (.27)	.98 (.17)	.51
<i>Power control theory</i>			
Patriarchal family form	.52 (.05)	.43 (.05)	1.75
Maternal relational control	.32 (.08)	-.08 (.13)	6.23*
Paternal relational control	.28 (.11)	-.14 (.11)	7.98**
Maternal instrumental control	2.61 (.13)	2.69 (.13)	.19
Paternal instrumental control	2.05 (.16)	1.73 (.15)	2.81+
Parental instrumental control	.63 (.06)	.78 (.03)	4.52*
Risk taking/aversion	8.70 (.24)	8.84 (.28)	.13
<i>Family structure</i>			
Family structure (2 natural/adoptive parent family=1; step parent family=0)	.83 (.04)	.79 (.04)	.62
Number of siblings	1.92 (.22)	2.00 (.11)	.12
<i>Controls</i>			
Age	15.52 (.26)	15.56 (.22)	.02
Underclass	.20 (.05)	.20 (.04)	.00
Parental substance use	1.84 (.08)	1.90 (.10)	.26

Linearized standard errors in parentheses below coefficient estimate. *** = p<.001, ** = p<.01, * = p<.05, + = p<.10.

Gender and American Indian Substance Use

Table 2: Negative Binomial Regression of Substance use Measures among American Indian Adolescents
(Males: n=192; Females: n=187)

	Alcohol consumption		Marijuana consumption		Alcohol problems	
	Males b	Females b	Males b	Females b	Males b	Females b
Patriarchal family form	0.575 (.787)	-1.796** (.654)	0.260 (.555)	-1.303+ (.782)	0.309 (.466)	-1.805*** (.445)
Maternal relational control	-0.267 (.393)	-0.024 (.292)	-0.715 (.534)	0.260 (.267)	0.039 (.352)	0.007 (.203)
Paternal relational control	-0.594 (.400)	-0.529* (.205)	0.209 (.319)	-0.608+ (.312)	-0.330 (.278)	-0.420* (.200)
Maternal instrumental control	-0.386 (.374)	0.042 (.180)	0.115 (.133)	-0.296 (.201)	-0.050 (.145)	0.138 (.141)
Paternal instrumental control	0.110 (.193)	0.13 (.208)	-0.437* (.182)	0.130 (.204)	0.325* (.148)	-0.076 (.136)
Parental instrumental control	-1.381+ (.735)	-2.027* (.952)	-2.017** (.660)	-2.049* (.876)	-0.833 (.544)	-0.335 (.448)
Risk taking	0.138 (.179)	0.149 (.109)	0.278 (.184)	0.198+ (.111)	-0.007 (.125)	0.015 (.050)
Underclass	-0.004 (.720)	0.635 (1.138)	1.002 (.667)	-1.545+ (.856)	-0.826 (.628)	-0.018 (.589)
# of siblings living at home	-0.064 (.150)	-0.242 (.205)	0.022 (.102)	0.170 (.284)	0.216* (.106)	-0.133 (.184)
Age	0.564*** (.171)	0.712* (.322)	0.037 (.170)	-0.098 (.207)	0.265+ (.150)	0.193 (.147)
Two biological/ adoptive parents	-1.168 (.848)	-0.643 (.712)	-2.114*** (.618)	0.309 (.741)	-1.863*** (.518)	-0.231 (.439)
Parental substance use	-0.083 (.215)	.366 (.279)	-.064 (.336)	.439 (.340)	-.335 (.231)	.411* (.159)
Constant	-2.941 (3.180)	-6.008 (4.073)	1.479 (3.587)	1.941 (3.008)	-3.410 (2.499)	-3.184 (2.615)
F (11, 118)	1.98	2.60	6.20	5.80	4.82	2.41
/lnalpha	2.21	2.32	2.37	2.52	1.31	1.45
alpha	9.14	10.17	10.74	12.44	3.69	4.28

Linearized standard errors in parentheses below coefficient estimate. *** = p<.001, ** = p<.01, * = p<.05, + = p<.10.

Gender and American Indian Substance Use

Appendix A: Select measures utilized in the analyses

Variable	Items	Cronbach's alpha
Alcohol Problems	<p>Over the past 12 months, how many times has each of the following things happened?</p> <ol style="list-style-type: none"> 1. You got into trouble with your parents because you had been drinking. 2. You had problems at school or with schoolwork because you had been drinking. 3. You had problems with your friends because you had been drinking. 4. You had problems with someone you were dating because you had been drinking. 5. You did something you later regretted because you had been drinking. 6. You got into a sexual situation that you later regretted because you had been drinking. 7. You got into a physical fight because you had been drinking. 	.80
Maternal Relational Control (Higher values indicate greater relational control.)	<p>Questions were asked about the resident mother.</p> <ol style="list-style-type: none"> 1. Most of the time, your mother is warm and loving toward you. 2. When you do something wrong that is important, your mother talks about it with you and helps you understand why it is wrong. 3. You are satisfied with the way your mother and you communicate with each other. 4. Overall you are satisfied with your relationship with your mother. 5. How close do you feel to your mother/adoptive mother/stepmother? 6. How much do you think she cares about you? 	.74
Paternal Relational Control (Higher values indicate greater relational control.)	<p>Questions were asked about the resident father.</p> <ol style="list-style-type: none"> 1. Most of the time, your father is warm and loving toward you. 2. You are satisfied with the way your father and you communicate with each other. 3. Overall you are satisfied with your relationship with your father. 4. How close do you feel to your father/adoptive father/stepfather? 5. How much do you think he cares about you? 	.78
Risk Taking (Higher values indicate greater risk taking behavior.)	<ol style="list-style-type: none"> 1. When you have a problem to solve, one of the first things you do is get as many facts about the problem as possible. 2. When you are attempting to find a solution to a problem, you usually try to think of as many different ways to approach the problem as possible. 3. When making decisions, you generally use as systematic method for judging and comparing alternatives. 4. After carrying out a solution to a problem, you usually try to analyze what went right and what went wrong. 	.74

ENDNOTES

¹ Nakao and Treas had 1500 General Social Survey respondents rank 740 occupations and constructed a prestige scale based on the broad categories of the Census

² The decision to use negative binomial regression models was based on the results of an analysis comparing the fit of poisson, negative binominal regression, zero inflated poisson, and zero-inflated negative binomial regression models using a procedure in STATA called *countfit* (see Long and Freese, 2006: pp. 409-414).

³ The SUEST procedure, in conjunction with *test*, is a more appropriate test of whether a variable has a similar effect across the models of two different groups in non-linear analyses, because such an approach assesses whether the impact of a measure differs across groups by taking a ratio of the two coefficients” (Hoetker, 2007, pg. 338) and thus removes the impact of unobserved variation.