Monitoring and Peer Influences as Predictors of Increases in Alcohol Use Among American Indian Youth

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Abstract

This study investigated the combined influence of parental monitoring, community monitoring, and exposure to substance-using peers on early-onset alcohol use in a sample of American Indian adolescents in 3 Pacific Northwest tribal communities. We used structural equation modeling, including tests of indirect effects, in the investigation of 281 American Indian youth between ages 8 and 16 years at the time of consent. The effects of parental monitoring and community monitoring, mediated by friends' substance use, were examined in terms of youth alcohol use outcomes. Parental monitoring practices and contagion in peer substance use were proximal predictors of early-onset alcohol use while the mediating effect of friends' substance use was not significant. Community monitoring accounted for unique variance in affiliation with substance-using friends.

Key words: monitoring, alcohol, American Indian reservation youth, peer relations.

Monitoring and Peer Influences as Predictors of Alcohol Use Among American Indian Youth in Reservation Communities

Alcohol and other drug use is a serious concern for tribal communities and for parents with adolescents living in American Indian (AI) reservation communities. AI youth tend to initiate substance use at a relatively early age (Kulis, Okamoto, Dixon Rayle, & Sen, 2006; Schinke, Tepavac, & Cole, 2000), use multiple substances (Novins, Beals, & Mitchell, 2001), and maintain high levels of adolescent substance use (Spear, Longshore, McCaffrey, & Ellickson, 2005; Wallace et al., 2002). The National Survey on Drug Use and Health (NSDUH, 2006) reported that 14.1% of AI youth age 12 to 17 needed alcohol abuse treatment and 11.6% needed illicit drug use treatment in 2003 and 2004. Novins and colleagues (2006) have shown that those AI adolescents who go into treatment are polydrug users, with a mean of 5.3 substances. Of those substances, marijuana is the first drug of choice (100%), followed by alcohol (96.6%), stimulants (57.3%), and cocaine (50.6%). In a survey conducted between 1976 and 2000, AI high school seniors had the highest level of alcohol and drug use when compared with use levels of seniors of other ethnic groups (Wallace et al., 2002; Winters et al., 2004). In addition, Mitchell and colleagues (2002) found in a community sample a 38% to 73% adolescent alcohol use rate and a 41% to 60% lifetime use rate for drugs of any kind.

Research in non-reservation communities has linked parental practices, in particular parental monitoring and supervision, to adolescent substance use and delinquent behavior (Barrera et al., 1999; Forehand, Miller, Dutra, & Chance, 1997; Mohatt et al., 2004). The most compelling evidence linking parenting practices and adolescent substance use is the finding that random assignment to interventions that affect these parenting practices reduces use (Connell, Dishion, &

Deater-Deckard, 2006; Dishion, Nelson, & Kavanagh, 2003; Mason, Kosterman, Hawkins, Haggerty, & Spoth, 2003).

Longitudinal evidence of peer and family influence suggests that the two are highly correlated, and that peer deviance and drug use is often the stronger correlate (Chassin, Presson, Sherman, & Curran, 1992; Dishion et al., 1995). Examination of monthly variation in drug use has revealed the power of peers to change the drug-use patterns of young adolescents (Dishion & Medici Skaggs, 2000). Furthermore, evidence suggests that engagement with and interactions within a drug-using peer group motivate youth to resist their parents' efforts to monitor them, which in turn leads to more time with peers and further exposure to settings organized around drug use (Dishion, Bullock, & Kiesner, 2008).

An ecological and historical perspective is critical for understanding child and adolescent development in AI communities. Explaining the elevated levels of AI adolescent alcohol and drug use entails understanding traditional cultural childrearing practices and the consideration of present and past disruptions of community contexts, as well as research on proximal socialization processes within the family and peer groups. The general principle is that a wide variety of parenting strategies are highly effective yet unique with respect to cultural organization of AI families (Whiting & Edwards, 1988; Mohatt et al, 2004). In a historical context, traditional Indian parenting was multifaceted, and different methods were used depending on what fit a child's development. For instance, infants and toddlers were understood to be incapable of knowing right from wrong and were not disciplined, but redirected. As children came to the age of understanding, they were expected to start knowing what behaviors were acceptable, and were gently guided to them. Different methods were applied according to persistence of behavior or severity of behavior. In many tribes, parents never hit their children or even severely disciplined

them. If this type of discipline were needed, it was taken care of by someone else, perhaps by an uncle or aunt; some tribes appointed individuals to mete out discipline (i.e., whip man). The bond between parent and child was a sacred bond and the keystone to tribalism. Consistent with ethological analyses, indigenous parenting, which integrated other community members in the process of monitoring and disciplining children, was quite effective for promoting children's prosocial behavior, such as cooperating, completing family chore routines, and helping family and tribal members (Whiting & Edwards, 1988), and in securing low levels of adolescent problem and norm-violating behaviors endemic to western cultures (Schlegal & Barry, 1991).

As with many indigenous cultures around the world, effective cultural socialization systems were disrupted by contact with, and colonization by, non-Indian Europeans (Duran & Duran, 1995). Numerous policies were aimed at breaking tribalism by attacking the Indian family, and they continue to be carried out to this day. The more obvious examples are sending generations of children to boarding schools, placing children in non Native foster homes, outlawing Native religious and spiritual practices, and prohibiting children from using tribal languages. These policies led to replacing an evolved and elaborate parenting and socialization system of raising children with patterns of parenting that emphasized the nuclear family and that were often modeled on the coercive practices of boarding schools.

This project examined the combined influence of parental monitoring, community monitoring, and exposure to peers with drug related problems on early-onset alcohol use in a sample of AI adolescents in three tribal communities. This research adds to the literature on adolescent alcohol use in that it assessed both direct and indirect influences, several dimensions of monitoring. In this analysis we sought to understand if parental monitoring and community monitoring, mediated by peers' alcohol and drug use, affects youth alcohol use outcomes.

Method

Recruitment Strategies

A multiple baseline design was followed to recruit families from three tribal communities in the Pacific Northwest during a 3-year period. Recruitment strategies in each tribal community occurred during the first 3 months of field implementation. An initial recruitment letter was sent to parents/caregivers with youth between ages 8 and 16 years and was followed up by two recruitment flyers. Each of the tribal newsletters included a description of the study, called the Community Shadow Project, and informational flyers were posted in locations frequented by community members. Recruitment tables were set up at regular community gatherings that involved both caregivers and youth (e.g., sporting events, back-to-school functions). Research staff summarized the project to caregivers, gave them verbal assurance of confidentiality, and handed out copies of the project description, timeline, and consent/assent forms.

Participation was voluntary and assurances were made that the family's decision regarding participation did not affect tribal services and status within the tribal community. Criteria for exclusion from the study included lack of child assent, youth living in the home for less than 6 months prior to the study, and nontribal status of both parents.

Participants

We used tribal membership rolls to recruit 312 youth participants (104 from each of three AI reservations) between ages 8 and 16 at the time of consent. Many families had more than one youth participating in the study, so we accounted for the nested nature of the data by using the complex survey analysis option available in the Mplus software, and specifying families as the clustering variable. Of the 312 youth participants, 25 withdrew from the study, and 6 failed to provide data on all of the variables of interest to this study, so the final analyses were based on

281 participants (90.0% of the original sample). The most common reason given for dropping out of the study was not enough personal time because of competing activities (sports or community functions). Other reasons included youth moving out of a service area, placement in child protective services, and youth no longer interested in participating.

Sample Composition

At the time of Wave 2 data collection, the participants were ages 8 years 0 months through 18 years 1 month (*M* = 12 years 11 months; *SD* = 2 years 8 months), with a slightly higher representation of females (54.8%) than of males (45.2%). Age and gender were found to be representative of the tribal community sample according to their enrollment records.

The majority of primary caregivers identified themselves as the biological mothers of the participating child (63.7%), followed by 15.1% grandmothers or great-grandmothers, 8.6% biological fathers, 3.6% stepmothers, 2.9% aunts; the remaining 6.1% had a different relationship to the child (other relative, adoptive or foster parent). Most primary caregivers were female (87.8%). Most caregivers (79.5%) reported that the youth had a biological parent in the home, 24.1% lived with both parents, 45.0% lived with their biological mother only, 10.4 % lived with their biological father only; 20.5% did not live with either of their biological parents. The families provided information about other adults living in the same household as the youth: 25.2% of them included a stepparent or live-in partner, 23.4% included at least one grandparent, 15.0% included at least one uncle or aunt, and 3.6% of children lived with at least one foster parent. We found that 70.5% of the participating families included more than one child living in the household, and 80.4% of participating youth shared their primary home with other children. Among these, 74.4% had at least one brother or sister, 14.6% had at least one cousin, 4.3% had at least one foster child at home, and 6.0% had at least one stepsibling. We collected data about the

number of people living in participants' household for two of the three sites. We found that on average 5.2 people (*SD* = 1.84) lived in the same house, with a range of 2 to 9 people. To verify if this number would be significantly different for participants from the site where we did not collect this information, we computed a proxy variable from a set of 19 questions asking about the presence of other people in the home (e.g., siblings, cousins, foster children, others), but not about their specific numbers. In this question, the range of people living in the house was 2 to 8 or more. An ANOVA confirmed that the numbers obtained on this proxy variable did not differ significantly across the three sites, $F(2, 275) = 0.25$, *ns*.

The project's protocols and procedures were reviewed and approved through the tribes' approval processes and the University of Oregon IRB, and a Certificate of Confidentiality was granted by the National Institute on Alcohol Abuse and Alcoholism (National Institute of Health). Given that certain language was required in the consent forms by the university IRB and in the Certificate of Confidentiality Statement, the research assistants reviewed the written consents verbally to make certain that the participants clearly understood the confidentiality agreement. A parent consent and youth assent was obtained for each participant.

Procedures

Data were collected in three phases and included demographics, family and peer information, and history of alcohol use and other drug use for the youth and family. The first phase of data was collected after the consent process which included a 1.5 hour in-person interview (Wave 1) with the youth and primary caregiver. We then collected a succession of 20-minute monthly telephone interviews for 3 to 6 months; information was used to assess the baseline level of alcohol use. The second phase of data included a lengthy assessment (2 hours; Wave 2) obtained through in-person interviews and family taped observations with the youth and

the primary caregiver. Another succession of 20-minute monthly telephone interviews during a 12-month period followed. Parental monitoring, community monitoring, and friends' substance use were measured at that time. The third phase data were collected typically between the 18th month through the 30th month, beginning with the Wave 3 lengthy assessment followed by the succession of monthly telephone interviews, from which we computed alcohol use at the end of the study (our outcome variable).

Data were collected by university- and community-based research assistants, most of whom were either college graduates or college students. The data were stored at the University. A family ally, hired from the tribal community, conducted home visits to those families who did not have telephones, were difficult to reach, or had a disability that required additional time completing the assessments. All interviewers were thoroughly trained to conduct the interview in a matter-of-fact style, avoiding extended conversation that might lengthen the telephone interview or bias the responses provided. All interviewers received 60 hours of initial training, and periodic monitoring and refresher training were provided as needed.

Extra effort was made to ensure confidentiality of the child or parent while interviews were conducted, whether in person or by telephone. Interviews were conducted in a separate office so neither the child nor the parent interview could be overheard. When conducting a telephone interview, the caller first asked if the person being interviewed were in a place where they felt comfortable that they would not be interrupted or overheard.

Measures

Age. The age of participating youth was computed from the date of birth provided by the primary caregiver during the consent process.

Parental monitoring. To compute this latent variable, three measures were administered in different formats with three different informants. The first measure was a five-item scale from the Student Self-Report Survey (SSRS; Dishion & Stormshak, 2001) completed by the youth. Items asked the youth *How often during the past three months did at least one of your parents: 1) know where you go and what you do after school, 2) know what you are doing when you are away from home, 3) know where you are after school, 4) have a pretty good idea about your plans for the coming day, and 5) had a pretty good idea about your interests, activities, and whereabouts.* The rating scale for each question ranged from 1 to 5. The mean score on all five items was computed with a reliability of $\alpha = .87$.

The second measure of parental monitoring was a four-item scale administered to the primary caregiver, asking *How often did you 1) know what your child was doing when he/she was away from home, 2) know where your child was after school, 3) know about your child's plans for the coming day, and 4) have a pretty good idea about your child's interests and activities.* The rating scale for each question ranged from 1 to 5. The mean score on all items was computed with a reliability of $\alpha = .82$.

The third measure used to create the parental monitoring latent variable came from a structured observation task called the American-Indian Family Assessment Task (AIFAST) in which the caregiver, the target child, and other siblings participated. The overall AIFAST involved eight tasks that took approximately 60 minutes and possibly longer when there was more than one participating child in the family. The families were given standard instructions for each videotaped family management task. The Lack of Parental Monitoring scale was derived from the monitoring task. The child is first asked to talk about a time in the past month when he or she spent at least 1

hour with friends outside of adult supervision. Following the youth's description, the caregiver is asked to comment, ask questions, or gather more information.

The videotapes were coded by trained undergraduate research assistants who completed macro-ratings of peer interaction dynamics following each observation task on the basis of their general impression of the interaction. To assess reliability, 20% of the data were randomly sampled and coded by two separate coders to ensure that it remained at least at $\kappa = .70$, with an interrater agreement at 85% or more for macro-ratings. All coding was performed with the Observer XT version 8.0 (2008) coding program run on a personal computer.

The Lack of Parental Monitoring scale was based on 7 macro-ratings completed after the previously described task. These macro-ratings reflected the coder's impression that the child was lacking adult supervision, adult involvement, structure, and rules. Each macro-rating was made on a scale ranging from 1 (*not at all*) to 9 (*very much*). The mean score on all 7 items was computed with a reliability of $\alpha = .84$. In contrast with the child and parent reports of monitoring, higher scores on the monitoring task measure originally indicated a more severe lack of parental monitoring. To facilitate interpretation of the results, this scale was reverse coded so that in the following analyses, higher scores on this measure reflect higher levels of parental monitoring.

Community monitoring. This item was added after receiving feedback from the first tribal site. This variable was computed using one item in the parent report, "How often have friends or community members told you what [youth's name] was doing during their free time?" It was rated on a 5-point scale, from 1 (*never or almost never*) to 5 (*always or almost always*).

Friends' substance use. This variable was assessed using a two-item scale adapted from the Community Action for Successful Youth scale (Metzler, Biglan, Rusby, & Sprague, 2001). The items queried youth about how many times they had been with friends who used substances

during the past month. Participants were asked whether they had been with friends who smoked cigarettes or used chewing tobacco, or who used alcohol or other drugs during the past month. Each item was rated on the following scale: 0 (*never*), 1 (*once*), 2 (twice), 3 (*three times*), 4 (*four or five times*), 5 (*six or seven times*) or 6 (*more than seven times*), and items were averaged to create a single score with a reliability of $\alpha = .78$. It is important to note that when referring to friends, 89.6% of the Native youth who participated identified their siblings and cousins as friends. In fact, 17.6% included referred to one relative as a friend, 18.3% referred to two relatives as friends, 17.2% referred to three relatives as friends, and 36.6% referred to four or more relatives as friends.

Child alcohol use. These outcome variables were computed using a signal-detection method (Dorfman & Alf, 1969) applied to the monthly phone interviews conducted with youth and their caregivers. Because substance use is a relatively low-base-rate behavior, yearly assessments that ask informants to report retrospectively about the occurrence of this behavior during the past few weeks may miss important information that happened throughout the past year. Behaviors that are not socially approved of are more likely to be underreported because of a social desirability bias of the informant (Davis, Thake, & Vilhena, 2010). However, we can expect that using monthly assessments to measure those behaviors and posing those questions to more than one informant is more likely to yield true positive answers than are standard, yearly reports. A positive answer should be especially meaningful in this context. To avoid diluting its value by possible false negatives, we used the maximum score obtained during the first six months following the assessment of parental monitoring, community monitoring, and friends' problem behavior (i.e., months 1 through 6) to compute the baseline score of alcohol use. We used the

maximum score obtained during the last six months of data collection (i.e., months 19 through 24) to measure the final level of alcohol use.

In a monthly telephone interview the primary caregiver and the youth answered questions about how often the youth had used alcohol in the past month. Responses were rated on a scale ranging from 0 (*never*) to 3 (*often*). The maximum score for alcohol in the first 6-month period (baseline) and the final 6-month period (outcome) was used.

Results

Preliminary Analyses

Missing data. Missing values were present in the dataset because of the longitudinal nature of the study design. In addition, on the basis of consultation and feedback from the first tribal site, some questions were added or minor word changes were made to the assessment for Tribal Sites 2 and 3. These minor changes were made to ensure cultural understanding and inclusion of the measures and constructs. For this analysis, Community Monitoring is the only added variable that was not included for the first site. Across all variables included in our main analyses, approximately 9.13% of the data were missing. The percentage decreased to 5.2% when excluding the Community Monitoring variable, for which 36.7% of values were missing.

To verify whether data were missing completely at random (MCAR; Little, 1988), we conducted a missing value analysis using the SPSS software version 19. The Little's MCAR test conducted on all quantitative measures revealed that the pattern of missing values was not completely random, $\chi^2(122) = 185.89$, $p < .001$. To verify whether certain participants were more likely to have missing data, we created a variable reflecting the number of missing values for each participant, and we explored its relationship with other variables. We found small significant correlations revealing that participants using more alcohol at the beginning ($r = .16$, $p < .01$) and

at the end of the study (r = .17, p < .01) had more missing data. No significant gender difference existed with regard to the number of missing values, but as expected, we found significant differences across tribes, F (2, 278) = 16.98, p < .001, with a larger number of missing values in the first site as compared to the other two sites (ps < .01 and .001). This was expected because the question about community monitoring was added only after data was collected at the first site. For the main analyses, we assumed that the pattern of missing data was not MCAR, but rather missing at random (MAR). Under this assumption, Widaman (2006) suggests that we can get valid results if we include predictors of missingness (e.g., alcohol use) in the statistical model, while using the full information maximum likelihood method (FIML) to manage missing data. When using FIML, missing data is not imputed; rather, the estimation of each parameter is done on the basis of all available information from each participant. Consequently, we were able to retain in the analysis participants with occasional missing data so they contributed to model estimation.

In the primary analyses, which consisted of structural equation modeling (SEM), adequate covariance coverage was present for the variables that were collected at all three sites (ranging from .79 to 1.00). Covariance coverage was lower for pairs of variables that included Community Monitoring (.53 to .63), for reasons described previously. Missing data in all models were managed with the FIML procedure used by Mplus.

Differences across genders and across tribes. Gender differences in all observed variables were tested using a series of t-tests. Only two measures differed across gender. Both were indicators of parental monitoring and suggested that parents monitor their girls more closely than their boys; for the videotaped parent–child interaction, t(244) = −3.75, p < 001, and for youth's report of parent monitoring, t (279) = –2.26 p < .05. Differences in all observed variables across the three tribes were tested using a series of one-way ANOVAs, and only one variable

differed significantly across tribes, that is, initial levels of alcohol use, F (2, 246) = 3.17, $p < .05$. A post hoc Bonferroni test revealed that youth from the tribe who first participated in the study had higher levels of alcohol use (M = 0.38, SD = 0.74) than participants from the last participating tribe (M = 0.13, SD = 0.43). The other tribe did not differ from the other two (M = 0.26, SD = .74). Table 1 presents means and standard deviations for the overall sample, because most measures did not differ significantly across gender or tribe.

Correlations. Table 2 presents correlations among all measured variables. Monitoring varied by age of the adolescent, with older adolescents being less monitored, as shown by the negative correlation between age and the three measures of parental monitoring. Older participants were more likely to have friends who engaged in problem behavior and more likely to use substances. There was no significant association between age and community monitoring.

All three measures of parental monitoring were intercorrelated. As expected, the three monitoring measures were negatively related to participants' substance use and to friends' substance use (only marginally significant for parent's report of monitoring). Community monitoring correlated with parental monitoring from child report, and it was negatively related to friends' substance use. As expected, friends' substance use was moderately related to participants' own substance use. Last, both measures of alcohol use were strongly correlated.

Test of Measurement Model for Parental Monitoring. Before testing the overall model, we verified the fit of the one latent construct, parental monitoring, in isolation. Because it is comprised of three indicators, testing this factor yields a perfectly identified model with no usable fit indices. Thus, we ran a more conservative model in which the loadings of the two-questionnaire based measure (with identical scales, rated from 1 to 5) were constrained to equality.

All fit indices suggest that the measurement model is adequate: $\chi 2$ (1) = 1.61, *ns*, RMSEA = 0.05; CFI = .98; TLI = .94; SRMR = .04.

Primary Analyses

To test our mediation hypotheses, we used SEM (Mplus software, version 6), including tests of indirect effects. We used the MLR estimator, and we specified that the nature of our sample was complex (i.e., participants nested within families). MLR is a maximum likelihood estimation technique that offers a χ^2 statistic and standard errors that are robust to non-normality and to the non-independence (i.e., nestedness) of our observations. According to Kline (2005), indices of adequate model fit in SEM include a nonsignificant chi-square value, comparative fit index (CFI) and Tucker-Lewis index (TLI) values at .90 or more, root mean square error of approximation (RMSEA) values at .08 or less, and standardized root mean square residual (SRMR) values at .10 or less.

Our analytic plan was to first test our hypothesized full-mediation model on the overall sample. As a second step, we explored the possibility that an alternative, partial-mediation model would improve the fit of the model to the data. Model comparison was accomplished by comparing the chi-square values of the two models. After identifying the best-fitting model, we ran multiple group analyses to verify if the model obtained with the overall sample could generalize to both genders and to both younger and older participants. The hypothesized model is presented in Figure 1. Bolded paths are hypothesized to be involved in mediation pathways. The hypothesized correlations between baseline alcohol use, parental monitoring, and community monitoring are not presented to enhance figure clarity, but they were included in the model.

Testing the full-mediation and partial-mediation models on the overall sample. We first ran the full-mediation model (Figure 1) on the overall sample, and the fit was adequate

according to some, but not all indices, $\chi^2(13) = 28.28$, $p < .01$; CFI = .94, TLI = .87, RMSEA = .07, SRMR = .04. Modification indices suggested that the relationship between parental monitoring and alcohol use may not be entirely mediated by friends' problem behavior, so we added a direct path from parental monitoring to alcohol use. This alternative model improved the fit to the data as indicated by $\chi^2(12) = 18.96$, *ns*; CFI = .97, TLI = .94, RMSEA = .05, SRMR = .03. The chi-square difference test with scaling correction for models estimated using MLR (Satorra & Bentler, 2001) revealed that the alternative, partial-mediation model fit the data significantly better than did the full-mediation model, $\chi^2(1) = 9.76$, $p < .01$. Standardized coefficients obtained for the partial-mediation model are presented in Figure 2. Regression paths and correlations that were not significant are omitted from the figure to enhance its clarity, but they were estimated in the model. These include the regression path from parental monitoring to friends' alcohol use ($\beta = -.16$, *ns*), the one from age to community monitoring ($\beta = -.08$, *ns*), the correlation between parental monitoring and community monitoring ($r = .11$, *ns*), and the correlation between baseline alcohol use and community monitoring ($r = .12$).

Test of indirect effects. We used the test of indirect effect provided by the Mplus software to test for the two possible mediation pathways that emerged from the final model. Because the path from parental monitoring to friends' substance use was not significant, no indirect effect could emerge from these variables. The test revealed no significant indirect effect of community monitoring on alcohol use through friends' alcohol use (standardized coefficient = −.02, *ns*), and no significant indirect effect of baseline alcohol use on future alcohol use through friends' alcohol use (standardized coefficient = .05, *ns*).

Test of gender differences. To verify if the regression paths and correlations differed across gender, we converted the partial-mediation model into a multiple-group model in which all

regression and correlation coefficients were free to vary for males and for females, and then we ran the same model while constraining those coefficients to equality across genders. A chi-square difference test with scaling correction (Satorra & Bentler, 2001) comparing the fit of the unconstrained model, $\chi^2(28) = 36.90$, *ns*, and the constrained model, $\chi^2(41) = 58.94$, $p < .05$, revealed that the unconstrained model was not superior to the constrained model, $\Delta\ \chi^2(13) = 21.92$, *ns*, suggesting no gender differences.

Test of age differences. To verify if the regression paths and correlations differed across age groups, we used the same strategy as when we tested for gender differences. After splitting the sample into two groups using the median age (12.83 years), we converted the partial-mediation model into a multiple-group model in which all regression and correlation coefficients were free to vary across age groups, $\chi^2(28) = 32.50$, *ns*. We then ran the same model while constraining those coefficients to equality across age groups, $\chi^2(41) = 53.59$, *ns*. A chi-square difference test with scaling correction (Satorra & Bentler, 2001) comparing the fit of the two models revealed that the unconstrained model did not fit the data significantly better than did the constrained model, $\Delta\ \chi^2(13) = 20.51$, *ns*, suggesting nonsignificant age differences.

Discussion

This is the first study to use a multiagent and multimethod approach to studying factors associated with early-onset alcohol use in AI tribal communities. The vast majority of research on AI adolescents has included those who are living in mixed communities, has not focused on adolescent substance use, or has used self-report surveys as opposed to state-of-the-art direct observation. Essentially, parental monitoring practices and contagion in peer substance use seem to be proximal correlates of early-onset use. In addition to replicating and extending past research with adolescents, we found that community monitoring accounted for unique variance in peer

problem behavior. This study's findings suggest the relevance of past research on adolescent alcohol use in general and in particular, the need for cross-cultural research.

Because recruiting participants on reservations is a particularly costly and time-consuming enterprise, our sample size was relatively small for the model we tested. Therefore, results of the primary analyses should be interpreted with care, and this precaution should be taken even more seriously for the multiple group analyses (i.e., gender and age group comparisons). In particular, significant gender or age differences might have emerged from multiple group analysis if more power were available. The sample size limitation made it impossible to test adequately for differences across tribal sites because each of them included less than 100 adolescent. We suspect some tribal differences could have emerged if we had had enough participants per tribe so comparisons could be made in a multiple-group analysis. Not surprisingly, although there are fundamental indigenous similarities among the tribes (e.g., world view), there remains considerable diversity in beliefs, values, culture, resources, history, and family practices. To this extent, we posit that the peer and family processes associated with alcohol use must be considered relative to the cultural and historical context of each tribe.

The methodology used to build our parental monitoring construct was particularly strong. The multimethod, multi-informant measurement method is much superior to simpler measures commonly used in other studies. Moreover, this strategy is especially relevant for use in a cultural context in which perceptions and definitions of appropriate parenting practices offered by youth and by parents may be quite different from those usually adopted by European Americans (Mohatt, 2004). This variable is very important but had some relatively weak factor loadings (i.e., $\lambda < .50$). Even though the fit statistics were very good when this construct was tested in isolation of the overall model, we recognize that the loadings are less than ideal per Kline's (2011)

standards, who suggests that these should be around $\lambda = .70$. The factor loadings and the rho coefficient ($\rho = .46$) for the construct were in the moderate range. In sum, stronger and more culturally sensitive measurements should be developed. In fact, future studies should strive to refine each of its indicators to further improve this constuct's internal coherence, in order to get a better understanding of the role of parental monitoring in the development of youths from this neglected and high-risk population.

The community monitoring finding is an important area for future research conducted in tribal communities that can help validate and reinforce traditional means of child rearing. This first attempt to measure community monitoring provides evidence that suggests it is an important factor in the well-being of Native youth. In addition, the fact that the youth's age is negatively correlated with parental monitoring, but uncorrelated with community monitoring suggests community monitoring practice may be operating no matter what age of the youth. In other words, when parents relax their supervision, the community still keeps an eye on the youth as the same level as before. This suggests that family and community are important factors in the youth's decision of using alcohol and other drugs. Validating and using measures that truly reflect indigenous ways of knowing reinforces healthy community norms and strengthens motivation for change when these traditional practices have been incorporated into family interventions. In light of the historical practice of removing traditional family rearing customs from Native communities, helping to restore these practices through research creates a trusting environment that nurtures a relationship between researcher and community.

Unique to this study compared with previous parental monitoring studies conducted in non Native communities is that almost all AI youth participants identified siblings or close cousins as friends and peers. This kinship affiliation is not unusual in most Native communities, where large

extended families consider cousins to be brothers and sisters. Traditionally, aunts, uncles, grandmas, and grandpas are part of the Native family management network that helps raise a child. For this reason it seemed necessary to add the community monitoring question to the assessment. This addition emphasizes the importance of developing assessments of familial relationships beyond the nuclear family and suggests a broader conceptualization of parental monitoring for designing interventions to impact adolescent alcohol and drug use.

Despite demographic and cultural variations among AI tribes, our findings have implications for intervention and prevention programs in Native community settings. In terms of prevention and intervention, it is essential to think about working with the community and family, including siblings and cousins, versus using an individual treatment model. In most cases, adolescent substance abuse treatment approaches involve the youth learning refusal skills, avoiding peers who use, and focusing on the well-being of the individual. When peers are siblings and cousins, it creates a challenge for the youth themselves, especially those who come from a Native community where extended family kinships form the main structure of the traditional cultural framework.

Our findings, which proved to be generalizable across genders and age groups, facilitate creation of simple guidelines that can be communicated easily to caregivers of children whose ages span a large range, as is often the case for AI families.

Overall, parental monitoring is important for reducing substance use among AI adolescents. Although we hypothesized that contact with substance-using friends would be one of the mechanisms that explains this relationship, such friendships had unique associations with later alcohol use, rather than acting as a mediator of other risk factors. As a result, it appears to decrease contacts with peers who are engaged in problem behavior. However, the relatively strong residual

link between parental monitoring and youth substance use suggests that other mediation mechanisms must be identified to explain not only the role of parental monitoring, but also that of friends' substance use in the progression toward heavier alcohol use throughout adolescence. Another important result from this study is that, community monitoring appears to be another factor for reducing association with peers who are engaged in problem behavior. As such, we hypothesize that a significant mediation effect may be revealed in future studies for which a stronger measure is developed and implemented. Therefore, recommendations for further study would be to test an intervention model for AI communities that incorporate Native traditional practices and strengths of community monitoring that incorporates the importance of extended family kinships as part of the family management model. In addition, it would be beneficial to examine other traditional parenting practices (i.e. limit setting, communication) that may contribute to preventing problem behavior for Native youth. In Native communities in which family networks are sources of strength for family management practices, it appears necessary to enhance and build on this network system to promote youth health and well-being and minimize the use of alcohol and other drugs.

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Table 1

Descriptive Statistics for Each Measure

Variable	*M*	*SD*
Participant's alcohol use (outcome)	.45	.86
Participant's alcohol use (baseline)	.26	.66
Age in years	12.88	2.66
Parental monitoring (child report)	4.02	.98
Parental monitoring (caregiver report)	4.11	.83
Parental monitoring (interaction task)	5.24	1.30
Community monitoring	2.38	1.22
Friends' substance use	0.92	1.74

Table 2.

Correlations Among All Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.
1. Participant's alcohol use (outcome)	—							
2. Participant's alcohol use (baseline)	.56***	—						
3. Age in years	.34***	.29***	—					
4. Parental monitoring (child report)	−.26***	−.33***	-.23***	—				
5. Parental monitoring (caregiver report)	−.30***	−.14*	−.16**	.23***	—			
6. Parental monitoring (interaction task)	−.24***	−.23***	−.25***	.24***	.23***	—		
7. Community monitoring	.01	.02	−.10	.17*	.06	−.03	—	
8. Friends' substance use	.42***	.39***	.36***	−.26***	−.11†	−.20**	−.16*	—

Note. ***$p < .001$, **$p < .01$, *$p < .05$, †$p < .10$.

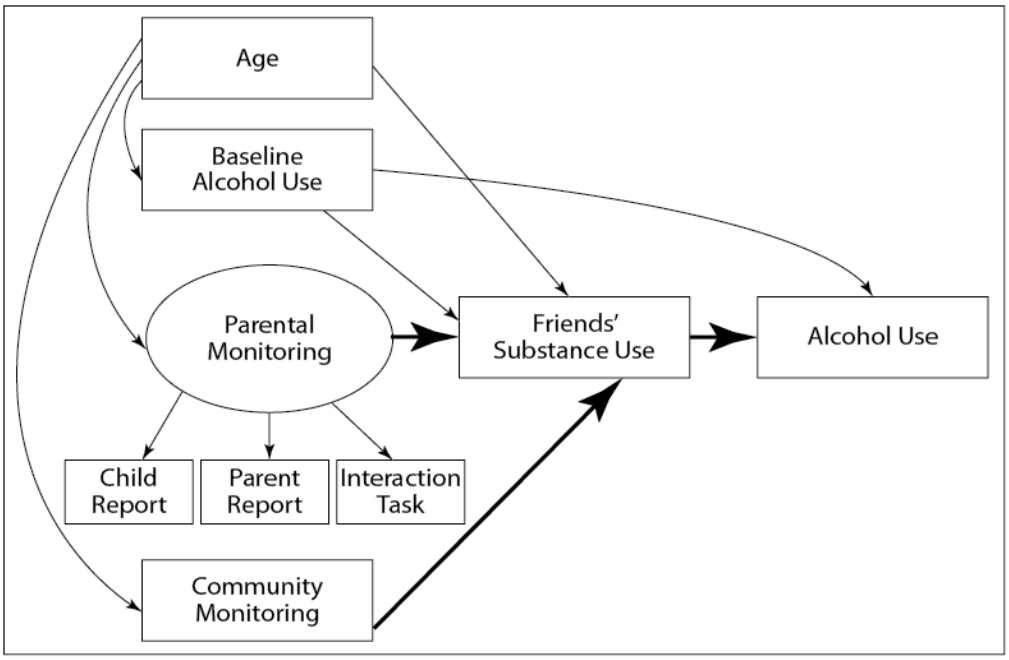

Figure 1. Initial, full-mediation model.

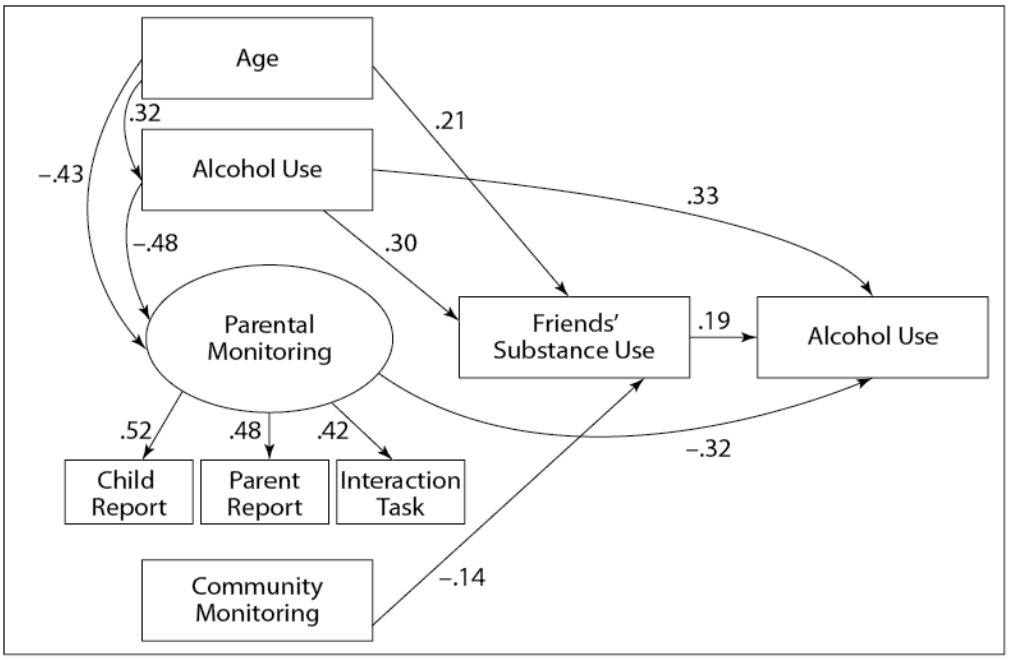

Figure 2. Final, partial-mediation model.