



# HHS Public Access

Author manuscript

*J Gambl Stud.* Author manuscript; available in PMC 2016 December 01.

Published in final edited form as:

*J Gambl Stud.* 2015 December ; 31(4): 1387–1404. doi:10.1007/s10899-014-9512-z.

## Sociocultural Influences on Gambling and Alcohol Use Among Native Americans in the United States

**David A. Patterson, Silver Wolf (Adelv unegv Waya),**  
Brown School Washington University, St. Louis, MO, USA

**John W. Welte,**  
Research Institute on Addictions, University at Buffalo, 1021 Main Street, Buffalo, NY 14203, USA

**Grace M. Barnes,**  
Research Institute on Addictions, University at Buffalo, 1021 Main Street, Buffalo, NY 14203, USA

**Marie-Cecile O. Tidwell, and**  
Research Institute on Addictions, University at Buffalo, 1021 Main Street, Buffalo, NY 14203, USA

**Paul Spicer**  
Department of Anthropology, University of Oklahoma, Norman, OK, USA

### Abstract

Gambling opportunities on and near Native American lands have increased in recent decades; yet there is a lack of research examining the patterns of problem gambling and alcohol abuse among Native Americans in the US. Traditional Native American cultural identity may be a protective factor for problem gambling and alcohol abuse among Native Americans. Telephone interviews were conducted with 415 Native American adults aged 18 years and older across the US. The past-year prevalence of gambling among Native Americans is similar to the rate for non-Native Americans in the US (80 vs. 77 %). However, Native Americans have over twice the rate of problem gambling as the US sample (18 vs. 8 %). Although Native Americans have a lower rate of past-year alcohol use than the US population (47 vs. 68 %), they have a somewhat higher rate of alcohol abuse than their US counterparts (5.5 vs. 4.3 %). Logistic regression analysis, with problem gambling as the dependent variable, revealed that lower socioeconomic status is significantly associated with an increased odds of problem gambling for Native Americans. Counter to the hypothesis, the higher the score on the Native American orientation, the higher the odds of being a problem gambler. Further, living by the “White way of life” was associated with a decreased odds of being a problem gambler; and perceived gambling convenience was associated with an increased odds of being a problem gambler. None of the Native American factors was significant in predicting alcohol abuse. These findings highlight the need for further investigation into the influence of cultural factors on Native American gambling.

---

barnes@ria.buffalo.edu.

**Conflict of interest** The authors declare they have no conflict of interest.

## Keywords

Gambling; Alcohol use; Native Americans; United States Survey

---

## Introduction

In recent decades, there has been a rapid growth of gambling on and off Native American lands. The National Indian Gaming Commission estimates more than 240 of the 562 Indian tribes in the US engage in gambling. The tribes which engage in gambling operate more than 400 casinos and bingo halls throughout 28 states which generate large economic benefits of for Native American communities (e.g., schools, hospitals, jobs, NIGC 2009). In spite of the significant involvement of Native Americans in gambling enterprises, there is very little empirical data on the prevalence and patterns of gambling and problem gambling among Native Americans in the US. Although there are 4.3 million Native Americans in the US, they represent only 1.5 % of the US population; and consequently, most general population surveys do not have sufficient numbers of Native Americans to analyze the differences in gambling behaviors and problems among Native Americans.

From the limited number of regional surveys of gambling among Native American adults, the rates of problem gambling appear to be higher among Native Americans than in other groups. In a North Dakota survey, Volberg and Abbott (1997) compared Caucasian and indigenous groups with regard to lifetime problem/pathological gambling. The indigenous group had a 14.2 % rate of problem/pathological gambling compared to a rate of 3.3 % for the Caucasian group. In the first national US survey of adults (Welte et al. 2001), it was found that Native Americans had similar rates of overall past year gambling (83.7 %) as whites (83 %), but Native Americans had higher rates of past year problem and pathological gambling (10.5 %) than any other racial/ethnic group. However, these findings were based on only 29 Native Americans in a national sample of 2,637. Other national gambling surveys have not reported rates among Native Americans (NORC 1999). Although the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) national survey did have a sizable number of Native Americans in the sample, gambling behavior was not assessed; only DSM-IV pathological gambling was measured. Native Americans comprised only 1.3 % of the entire group of 195 pathological gamblers (i.e., 2.5 individuals, Petry et al. 2005; Blanco et al. 2006). Thus, there is a serious lack of US general population survey data of Native Americans to assess gambling behaviors and problem gambling in this important group.

Population studies have shown that problem gambling and alcohol abuse have a high co-occurrence (e.g., Welte et al. 2001; Grant et al. 2002; Barnes et al. 2009). With recent characterization of problem gambling as an addictive disorder along with substance use disorders (American Psychiatric Association 2013), it is important to examine both problem gambling and alcohol abuse in the same population studies while taking into account important demographic factors such as gender, age and socioeconomic status. Although there has been very little research on gambling among Native Americans, there is a body of research examining alcohol use among Native Americans. Results from the National Survey

on Drug Use and Health (SAMHSA 2009) showed that Native Americans aged 18 and older had a lower prevalence of past year alcohol use than same-aged whites (57.2 % for American Indians/Alaska Natives vs. 73.9 % for whites). However, Native Americans had a higher rate of past-year DSM-IV alcohol dependence or abuse, 10.7 and 8.2 % for Native Americans and whites, respectively. These findings, in the context of the rapid expansion of commercial gambling on Native American reservations, quite naturally lead to an interest in the study of both alcohol abuse and problem gambling among the same subgroups of Native Americans. This present study is an initial step to determine the patterns of gambling, problem gambling and alcohol use and abuse among a diverse sample of Native Americans spread across the US.

In addition to determining the patterns and correlates of problem gambling and alcohol abuse among a diverse sample of Native Americans in the US, we will examine the effects of cultural identity and traditionalism on problem gambling and alcohol abuse. We hypothesize that traditional Native American cultural identity will be a protective factor against problem gambling as well as alcohol abuse. Tribal elders have reported that many problems are related to a loss of traditional beliefs and culture because tribal values are almost universal in prohibiting alcohol and other substance abuse (Szlemko et al. 2006). Native Americans are exposed to both their traditional cultures and to the broader US culture. Whitbeck et al. (2001) noted that scholars have differed on the effects of this dual exposure. Traditional culture may be seen as a source of strength or it can be seen as creating a sense of inadequacy when socialization to the majority society contradicts traditional Native American values. Oetting and Beauvais (1991) presented an orthogonal cultural identification theory for Native American youth. They argued that identification with Native American culture and with majority culture are independent of each other rather than at opposite ends of a continuum; and identification with either the minority or majority culture is a source of strength. Thus, the preponderance of the evidence suggests that Native American traditional cultural identification is a protective factor for addictive behaviors. To our knowledge, there are no studies which quantitatively address the relationships between traditional culture among Native Americans and problem gambling and alcohol abuse while taking into account important sociodemographic factors.

## Methods

### Sample

The present paper is based on a combined sample from two comparable Native American general population subsamples. The Survey of Native American Gambling (SONAG) was carried out in 2013 to complement the national Survey of Gambling in the US (SOGUS2) which was fielded between 2011 and 2013. Because Native Americans are a small proportion of the US population (~1.5 %), SOGUS2 was designed with a small oversample of Native Americans in selected telephone exchanges with high densities of Native Americans. SONAG adapted the same sampling strategy of acquiring a targeted Native American sample from Survey Sampling International, but it differed in that tribal areas not included in the SOGUS2 study were selected for the SONAG study to increase the diversity of tribes represented. Thus, the SONAG study included Native Americans from Arizona,

New Mexico, New York and Oklahoma with representation from Cherokee, Iroquois, Navajo and other tribal groupings. In contrast, the SOGUS2 study included Native Americans from North Carolina, Minnesota, South Dakota and Montana with the largest tribal groupings being the Chippewa, Sioux and Lumbee. Combining the two datasets, based on the same methods and questions, yields a diverse sample of Native Americans in the US. Table 1 gives the tribal distributions for the total sample of 415, broken down for each subsample—SONAG (n = 274) and Native Americans in a call-back subgroup of SOGUS2 (n = 141) (explained below).

More specifically, for SONAG, a telephone survey of 274 NAs aged 18 and older was conducted to develop and test culturally-sensitive socio-cultural measures of Native American identity and traditional practices to be used as predictors of gambling and cooccurring alcohol use/abuse among Native Americans in the US. A targeted Native American sample was obtained from Survey Sampling International which developed a sampling procedure based on a high Native American telephone exchange density rate (~50 %) and stratified by US states proportional to the Native American population in the states with the greatest Native American population. Approximately four of these top states were selected to obtain diverse tribal groupings (AZ, NM, NY, OK). Both SONAG and SOGUS2 studies included landline and wireless samples. In SONAG, the random-digit dial (RDD) landline phone numbers were selected from telephone exchanges within counties with a high percent of Native Americans, while the wireless phone numbers were selected from billing centers in counties with a high percent of Native Americans. For SONAG, there were 15,400 numbers selected; 9,800 (64 %) were RDD landline numbers and 5,600 (36 %) were wireless numbers. The unit of measurement for the landline sample was the household, but for the wireless sample, it was the individual. The SONAG sample yielded an N of 274 participants.

The Survey of Gambling in the United States 2 (SOGUS2) contains a large representative sample (N = 2,925) of the US adult population, plus an oversample of Native Americans (Welte et al. 2014). The representative sample contains 38 Native Americans. For the oversample, telephone exchanges were selected within the following states: Arizona, Montana, Minnesota, Alaska, South Dakota, North Carolina, Washington and Oregon. Six thousand RDD numbers were selected for the SOGUS2 targeted Native American sample. This yielded 237 interviews, for a combined total of  $38 + 237 = 275$  Native Americans in SOGUS2. Native Americans from the SOGUS2 study were re-contacted to complete the Native American cultural/tradition questions developed for the SONAG. This resulted in a subsample of 141 Native Americans in SOGUS2 for whom there are complete Native American cultural/traditional data consistent with the SONAG study. (Additional details on the sampling procedures for the SOGUS2 have been published—see Welte et al. 2014.) Data were weighted based on the gender and age distributions of Native Americans in the US using the 2010 US Census for the population 18 years and older obtained from the U.S. Census Bureau American Factfinder web site (<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>).

Both surveys were designed and carried out using Computer-Assisted Telephone Interviewing at the Research Institute on Addictions, The State University of New York at

Buffalo. Both surveys contained the same measures, including sociodemographic factors, gambling behavior, problem gambling, alcohol use, alcohol problems, alcohol abuse/dependence and availability of gambling opportunities. Additional questions on traditional Native American culture were developed for SONAG and also asked of the Native Americans recontacted from SOGUS2. In both studies, respondent's survey data were linked to geocoded geographic data including distance from the respondent's home to major gambling venues, e.g., casinos. Native American data from the SOGUS2 and SONAG studies were combined to increase power to examine gambling and co-occurring substance use among Native Americans in the US.

In both studies, respondents were paid \$30 for their time in completing the survey; Native American respondents in the SOGUS2 callback study were paid an additional \$10 for their time responding to the additional questions. The average time to complete the SOGUS2 survey was 40 min. The average time to complete the SONAG study was 45 min. The response rates in SONAG (274 respondents) were fairly similar in the RDD landline sample (52 %) and wireless samples (48 %). For the overall SOGUS2 study, the response rate was 54 % for the landline sample (1,748 respondents) and 63 % for the cell phone sample (1,215) (Welte et al. 2014).

### Dependent Measures

**Gambling**—Respondents were asked the frequency of past-year gambling on 15 types of gambling, including (1) office pools, and charitable small stakes gambling; (2) lottery; (3) pulltabs; (4) internet gambling; (5) casino, riverboat or cruise ship; (6) horse or dog track; (7) horses or dogs, off track; (8) gambling machines, not in a casino; (9) cards, not in a casino; (10) games of skill, e.g., bowling, pool, golf; (11) lottery video-keno; (12) bingo; (13) dice, not in a casino; (14) sporting events; and (15) other gambling. An overall gambling frequency variable was derived by summing the frequency of these types of gambling. The variable, any gambling, was a dichotomous measure defined as gambling at least once in the past year on any of the 15 types of gambling.

**Problem Gambling**—Problem gambling was based on four or more symptoms during the past year from three problem/pathological gambling scales. The three scales were the Diagnostic Interview Schedule (DIS-IV for pathological gambling, Robins et al. 1996), the revised South Oaks Gambling Screen (SOGS-R, Abbott and Volberg 1991) and the Canadian Problem Gambling Index (CPGI, Wynne 2003). The DIS for pathological gambling contains 13 items that map into 10 criteria, such as preoccupation with gambling and gambling to escape problems. In SOGUS1 (the precursor to SOGUS2 described above), this scale had a Cronbach's  $\alpha$  of 0.85. The SOGS-R contains 20 items that tap important dimensions of problem gambling, such as going back to recover your losses (“chasing”), and using extreme measures, such as writing bad checks, to get money to gamble. In SOGUS1, this scale had a Cronbach's  $\alpha$  of 0.81. Four non-redundant items of the nine items in the CPGI were selected for this study. These past 12 months-items were: borrowed money or sold anything to get money to gamble; bet more than you could really afford to lose; gambling caused you any health problems, including stress or anxiety; and gambling caused any financial problems for you and your household.

**Alcohol Use**—Alcohol consumption was assessed by a series of quantity and frequency questions for various alcoholic beverages. Beverages included: beer, malt liquor, wine, fortified wine, wine cooler and liquor. Responses to these questions, along with the alcohol content of each beverage, were used to calculate the respondent's average alcohol consumption in ounces of ethanol per day. This average consumption variable was recoded to create the dichotomous variable indicating any alcohol use in the past year.

**Alcohol Abuse and Dependence**—The DIS was developed to operationalize the DSM diagnosis in a structured interview (Robins et al. 1996). The alcohol abuse questions cover 12 negative consequences (fights while drinking, traffic accident while drinking, etc.). The respondent is asked if there was ever a 12-month period in which the consequences occurred more than once (lifetime abuse), and also whether they occurred more than once in the past 12 months (current abuse). The alcohol/drug dependence questions cover 30 symptoms of dependence which map onto the nine DSM criteria. Respondents are then asked if they had three or more criteria in any 12-month period (lifetime dependence) and in the past 12 months (current dependence). The ten sets of items measuring abuse and dependence for alcohol had excellent internal consistency reliability in our SOGUS 1 with Cronbach's  $\alpha$ 's ranging from 0.77 to 0.97.

Frequency distributions were run for each of the four dependent variables comparing the present Native American sample with the US national sample without Native Americans.

**Independent Measures**—Sociodemographic measures, asked in both SONAG and SOGUS2, include gender, age (18+ years), and socio-economic status (SES). SES was derived based on three equally weighted variables—respondent's years of education, occupational prestige and family income. The SES variable was scaled from one to ten (see Welte et al. 2011). The respondents' home address and zip code were geocoded to derive the 'distance to casino' variable. The gambling convenience variable was based on four self-report items asking how convenient it is for you to: buy lottery tickets, play bingo, play a video gambling or slot machine and visit a horse or dog track. The four response choices ranged from very inconvenient to very convenient.

**Native American-Specific Demographic Factors**—These include: the name of the tribe or band; grew up on a reservation; currently reside on a reservation; bingo, casinos, types of gambling on the reservation where respondent resides; is the reservation considered "dry"; does the respondent have a Native American traditional name; and can s/he speak a Native American language and if so, the degree of fluency.

**Participation in Traditional Native American Activities**—The frequency of participating in Native American activities during the past 12 months was assessed with a list of 16 items including Native American dancing, seasonal feasts, naming ceremonies, healing ceremonies, pow-wows. This list of Native American activities and ceremonies was adapted from Zimmerman et al. (1996) and Whitbeck et al. (2001) (see "Appendix").

**Biculturalism Measure**—Two measures were derived—living life in the Native American way and living life in the White-American way. Each measure was based on three

items with a four point Likert scale, i.e., respondents were asked about extent to which they live by the Native American way, their immediate family lives by the Native American way and their close friends live by the Native American way. The same three items were repeated for living in the White-American way. These measures were expanded and adapted from the work of Oetting and Beauvais (1991) and Moran et al. (1999). In the current study, the Cronbach's  $\alpha$  was 0.74 for the live by the Native American way of life and 0.80 for the live by the White-American way of life (see "Appendix").

**Native American Identity Scale**—A 12-item Native American identity scale was developed based on previous work of Phinney (1992) and Moran and Bussey (2007). The set of questions asked how being Native American affects the respondent's feeling and behaviors. Each item was answered using a four item scale—strongly agree, somewhat agree, somewhat disagree and strongly disagree. Examples of the items are: I have spent time trying to find out more about being Native American, such as Native American history, traditions, and customs; I am active in organizations or social groups that include mostly Native American members; I have a strong sense of belonging to my Native American community; I participate in Native American cultural practices, such as special food, music, or customs; and I feel a strong attachment toward my Native American community. The 12-item Native American identity scale had a Cronbach's  $\alpha$  of 0.87 (see "Appendix").

**Composite Native American Orientation Measure**—Because of high correlations between many of the Native American cultural measures (i.e., multicollinearity), a composite scale was derived for use in the logistic regression models. Six variables were standardized and added together to form a composite measure of Native American orientation. These six variables were: Native American identity, Native American way of life, total number of Native American activities, involvement in reservation life (combination of growing up and/or living on a reservation), fluency of speaking a Native American language and having a traditional Native American name.

## Results

Table 2 gives descriptive information regarding the four dependent variables—past year gambling, problem gambling, any alcohol use and alcohol abuse or dependence— according to key Native American variables. The percent gambling in the past year was fairly comparable in the Native American sample as compared with the US sample as a whole; 80 % of Native Americans reported gambling in the past year as compared with 77 % of the US non-Native American sample. However, Native Americans have over twice the rate of problem gambling as the US sample (18 vs. 8 %). Native Americans reported lower rates of overall drinking in the past year than the US population (47 vs. 68 %), but Native Americans had somewhat higher rates of alcohol abuse or dependence than their US counterparts (5.5 vs. 4.3 %).

A series of Native American-specific questions are further reported in Table 2 relative to the hypothesis that traditional Native American culture and identity are protective factors against problem gambling and alcohol abuse. From these simple descriptive analyses, without controls for demographic factors, there are some indications that more traditional

Native American characteristics are actually associated with *more* gambling and *more* gambling problems. These are the opposite effects from those hypothesized. More specifically, among those who grew up on a reservation, 84 % gambled in the past year and 26 % are classified as problem gamblers; whereas the respective rates are 76 % gambling and 12 % problem gambling among those who did not grow up on a reservation. Similarly, among those who currently live on a reservation, 24 % are current problem gamblers as compared with half the rate (12 %) for those who do not currently live on a reservation. Those Native Americans who do not speak their tribal language at all have the lowest rate of problem gambling (11 %) as compared with other groups who speak their Native tribal language a little (23 %), moderately well (17 %) or very well (22 %). Those who have a Native American name have a higher rate of problem gambling (24 %) as compared with those who do not have a traditional Native American name (15 %). Those who participate in the fewest number of Native American activities have the lowest rate of problem gambling (11 %) as compared with those in the medium and high categories (25 and 21 %, respectively). Similarly, those who responded that they did not live by the Native American way and those who indicated that they lived a lot by the White-American way had the lowest rates of problem gambling as compared to their counterparts in other groups. Thus, most of the individual variables measuring traditional Native American culture are associated with *more* gambling or problem gambling than those respondents less involved in traditional Native American culture. This same pattern does not apply for most of the bivariate relationships pertaining to alcohol use and abuse.

Two logistic regressions were performed with two levels of gambling involvement— any gambling and problem gambling—as the dichotomous dependent variables and demographic and Native American factors as the independent variables (Table 3). Only two variables were significant in predicting any gambling in the past year. Younger age was associated with an increased probability of gambling and the more convenient gambling was for the respondent the more likely s/he was to gamble even after controlling for the other variables in the analysis. In the problem gambling logistic regression, lower SES was significantly associated with an increased odds of problem gambling. The higher the score on the composite Native American orientation scale (comprised of Native identity, exposure to reservation life, live more by Native way, participation in Native American activities, speak a tribal language and having a Native American name), the higher the odds of being a problem gambler. Further, living by the White way of life was associated with a significantly decreased odds of being a problem gambler over and above the other variables in the analysis. Perceived gambling convenience was also significantly associated with an increased odds of being a problem gambler.

Two logistic regressions were performed with two levels of alcohol involvement—any alcohol use in the past year and alcohol abuse or dependence—as the dichotomous dependent variables and demographic and Native American factors as the independent variables (Table 4). As for overall gambling behavior, younger aged adults were significantly more likely than older adults to have had alcohol in the past year. Younger age was also associated with a significantly increased odds of having alcohol abuse or



dependence in the past year. None of the Native American factors were significant in predicting alcohol use or abuse.

## Discussion

The aims of this study were to determine the patterns of gambling, problem gambling and alcohol use and abuse among a diverse sample of Native Americans spread across the US and to test the hypothesis that traditional Native American culture/identity is protective against problem gambling and alcohol abuse. The hypothesis was not confirmed. In fact, a consistent pattern of findings, directly opposite from those hypothesized for problem gambling, emerged from this study. For instance, individuals who grew up on a reservation or currently live on a reservation have higher rates of gambling and problem gambling than their non-reservation counterparts. Problem gambling is lowest for those who do not speak a tribal language at all and the lowest rates of gambling and problem gambling are among those with the lowest number of Native American activities. Those with the lowest levels of “living by the White American way” have the highest level of problem gambling. In the multivariate analysis with all demographic and other independent variables controlled, the greater the Native American cultural orientation, the more likely respondents are to be problem gamblers. There were no significant patterns between traditional Native American variables and alcohol use/abuse.

This study found self-reported gambling convenience to be a significant predictor of problem gambling which is consistent with findings from the US general population which confirm that gambling availability has a significant effect on overall gambling and problem gambling (Welte et al. 2004). It is clear that gambling opportunities have increased in and around Native lands. However, the effect of Native American cultural orientation on problem gambling holds even with gambling convenience and the geocoded variable, having a casino within 30 miles of residence, taken into account. Thomas and associates (2011) noted that the relationship between gambling and gambling accessibility is likely to be multidimensional, more than the effect of proximity to gambling venues. In a qualitative study, using a semi-structured focus group and interview, the authors reported that over and above geographical accessibility, social and personal accessibility to gambling venues is likely to have an effect on gambling behaviors. Social/personal accessibility involved the degree to which the gambling venues are comfortable, welcoming places to visit with the potential for social interaction. The authors further reported that such social venues were often retreats or places to escape from “the reality of life.” Native American problem gambling might be examined in Native American contexts which are high on social and personal accessibility in addition to high on geographical accessibility. Perhaps there are emerging gaming norms due to the shift from historically Native American ceremonial and traditional gaming to commercial and Western forms (i.e., the casino, Breen and Gainsbury 2013; Momper 2010; Raylu and Oei 2004). The enactment of the Indian Gaming Regulatory Act and subsequent growth of tribal casinos and derived economic rewards for tribal members has advanced the casino, a modern, Western form of gambling, to the center of Native American social life instead of more traditional social activities, including traditional gambling (Breen and Gainsbury 2013; Peacock et al. 1999). In this culturally assimilative context, Native American identity maintenance entails tribal casino participation and

ultimately exposure to modern gambling which may increase the likelihood of developing problem gambling.

Despite these emerging socio-cultural arrangements that could promote problem behavior risk, other accompanying changes stemming from the growth of tribal casinos could also reduce risk and improve physical and mental health. Improved socio-economic conditions stemming from spent casino revenue (see Schaap 2010 for a discussion of such revenue spending in the context of Native American gambling industry growth) could improve the quality of life for Native American families and communities and positively impact these systems in which problem behaviors occur. For instance, Costello and colleagues (2003) found that 40 % of Native American children who resided on the reservation had a decrease in externalized behavior problems due to improved economic conditions from the opening of a tribal casino. Similar effects have been found for other health-related problems, including smoking and heavy drinking among Native American adults (Anderson 2013; Wolfe et al. 2012). This finding is of particular importance given that although Native Americans have higher rates of alcohol abuse as compared with other groups in the US population, the Native American factors were not significantly associated with alcohol abuse in this study. Alcohol use and abuse among Native Americans who reside near tribal casinos could be influenced by changes in economic conditions; however, the impact of fluctuating structural factors (e.g., poverty) on community-level systems and individual-level outcomes is rarely included in Native American addiction research. Thus, as the public health focus on problem gambling moves forward within a broader addictions research framework, future research should examine the interplay between structural and cultural factors for historically underrepresented racial minority populations, such as Native Americans.

Whereas the Indian Gaming Regulatory Act of 1988 (NIGC 2009) gave Native Americans special rights with respect to gambling on Indian lands to ultimately reduce their cycle of poverty, it also provided the context for political and legal controversies with states regarding distribution of economic benefits, such as taxes. Under these circumstances, some groups of Native Americans have become positive and protective of their casinos and bingo halls which represent Native American interests against the larger, sometimes hostile, American society. This context might influence Native Americans to see gambling as a way of asserting something positive about Native American culture; and thus, those who most strongly identify with Native American traditions may also be more likely to be involved with gambling per se. Although our hypothesis that stronger identity with Native American culture would protect Native Americans from problem gambling was in the opposite direction, we cannot suggest that cultural identity per se is actually a risk factor for problem gambling. However, prevention and intervention efforts are warranted in tribal communities in the context of cultural values and increased gambling venues and opportunities.

Although this is the first US general population study to specifically address the effects of Native American culture on problem gambling, there are nonetheless limitations to the study. The sample was an attempt to reach a diverse sample of Native Americans across the US and included respondents from 17 different tribal groupings; but this only approximates a truly representative sample of Native Americans in the US. Past large representative epidemiological studies of gambling in the US have had too few Native Americans for

substantive analysis. On the other hand, culturally-sensitive anthropological studies are generally targeted to distinct tribal groups, and due to the in-depth nature of the inquiry, these studies use small samples which do not generalize to the overall population of Native Americans in the US.

Another potential limitation of this study is that it was carried out as a telephone survey and such methods are limited to those reachable via telephone coverage. In past research, there has been a concern about lack of phone coverage in Native American areas. The most common citations for Native American phone coverage are based on the 2000 Census data which indicate that 2.4 % of the American population lack telephone service as compared with 16.9 % for Native Americans in tribal areas. However, these figures are more than a decade old. The newest US Census data from the 2013 American Community Survey show that 2.3 % of the total US population lack telephone service as compared to 5.0 % of American Indian/Alaska Natives. In addition, there are government programs providing free cell phones to low income persons and this study included cell phones as well as landlines. Clearly the gap in phone service between Native Americans and the US population as a whole has narrowed in recent years. Other general population sampling approaches, such as face-to-face in-home surveys would be prohibitively expensive given that Native Americans are only 1.5 % of the population. Native American respondents in this sample who have phones, nonetheless, have disproportionately lower incomes and higher unemployment than the US population as a whole.

Given the strengths and limitations of the present study, it is clear that there is a continued need for culturally-sensitive epidemiologic studies with general population samples of Native Americans to determine the patterns and correlates of gambling and cooccurring alcohol abuse as well as the impact of Native American cultural factors in preventing and enhancing problem gambling.

## Acknowledgments

This work was funded by Grant R21A020952 from the National Institute on Alcohol Abuse and Alcoholism to Grace M. Barnes, Ph.D., Principal Investigator.

**Ethical Standard** This research was approved by the Social and Behavioral Sciences Institutional Review Board at the University at Buffalo, IRB # IRB00003128. All human subjects gave their informed consent prior to being interviewed.

## Appendix 1: Native American Measures

Native American Activities in the Past 12 Months

Native American dancing.

Native American singing.

Native American drum group.

Native American games and sports.

Native American storytelling or cultural teachings.

Native American beading or jewelry-making.

Making Native American moccasins or clothing.

Tanning animal hides using Native American methods.

Ghost suppers.

Sweat Lodges.

Seasonal feasts.

Naming ceremonies.

Healing ceremonies.

Fasting ceremonies.

Giveaways.

Pow-wows.

Biculturalism Measure—Cronbach's  $\alpha = 0.74$  for live by the Native American way of life and 0.80 for live by the White-American way of life

Some Native Americans talk about living life in traditional Native American ways.

Some Native Americans talk about living life in White-American ways.

Do you live by or follow the Native American or tribal way of life,

“Not at all”... “A little”... “Some”... or “A lot”?

Do you live by or follow the White-American way of life,

“Not at all”... “A little”... “Some”... or “A lot”?

Does your immediate family live by or follow the Native American or tribal way of life,

“Not at all”... “A little”... “Some”... or “A lot”?

Does your immediate family live by or follow the White-American way of life,

“Not at all”... “A little”... “Some”... or “A lot”?

Do your close friends live by or follow the Native American or tribal way of life,

“Not at all”... “A little”... “Some”... or “A lot”?

Do your close friends live by or follow the White-American way of life,

“Not at all”... “A little”... “Some”... or “A lot”?

Native American Identity—Cronbach's  $\alpha = 0.87$  for 12-item scale

The next set of questions is about how being Native American affects your feelings and behaviors. Please let me know whether you “Strongly Agree”...“Somewhat Agree”... “Somewhat **Disagree**”...or “Strongly **Disagree**” with the following statements.

I have spent time trying to find out more about being Native American, such as Native American history, traditions, and customs.

I am active in organizations or social groups that include mostly Native American members.

I have a clear sense of my Native American background and what it means for me.

I think a lot about how my life will be affected by being a Native American.

I am happy that I am a Native American.

I have a strong sense of belonging to my Native American community.

I understand what my Native American membership means to me, in terms of how to relate to my own group and other groups.

In order to learn more about my Native American background, I have often talked to other people about being Native American.

I have a lot of pride in my Native American community and its accomplishments.

I participate in Native American cultural practices, such as special food, music, or customs.

I feel a strong attachment toward my Native American community.

I feel good about my Native American background.

## References

- Abbott, M.; Volberg, R. Gambling and problem gambling in New Zealand: Report on phase one of the national survey of problem gambling. Research Unit, Department of Internal Affairs; Wellington, New Zealand: 1991. Research Series No. 12.
- American Psychiatric Association. Diagnostic and statistical manual of mental disorders, fifth edition (DSM-5). Washington DC: 2013.
- Anderson, Robin. J. Tribal casino impacts on American Indians well-being: Evidence from reservation-level census data. *Contemporary Economic Policy*. 2013; 31:291–300.
- Barnes GM, Welte JW, Hoffman JH, Tidwell M-C. Gambling, alcohol, and other substance use among youth in the United States. *Journal of Studies on Alcohol and Drugs*. 2009; 70:134–142. [PubMed: 19118402]
- Blanco C, Hasin DS, Petry N, Stinson F, Grant BF. Sex differences in subclinical and DSM-IV pathological gambling: Results from the national epidemiologic survey on alcohol and related conditions. *Psychological Medicine*. 2006; 36:943–953. [PubMed: 16650342]
- Breen H, Gainsbury S. Aboriginal gambling and problem gambling: A review. *International Journal of Mental Health and Addiction*. 2013; 11(1):75–96. [PubMed: 24707239]
- Costello EJ, Compton SN, Keeler G, Angold A. Relationships between poverty and psychopathology: A natural experiment. *JAMA*. 2003; 290:2023–2029. [PubMed: 14559956]

- Grant JE, Kushner MG, Kim SW. Pathological gambling and alcohol use disorder. *Alcohol Research and Health*. 2002; 26:143–150.
- Momper SL. Implications of American Indian gambling for social work research and practice. *Social Work*. 2010; 55:139–146. [PubMed: 20408355]
- Moran JR, Bussey M. Results of an alcohol prevention program with urban American Indian youth. *Child and Adolescent Social Work Journal*. 2007; 24:1–21.
- Moran JR, Fleming CM, Somervell P, Manson SM. Measuring bicultural ethnic identity among American Indian adolescents: A factor analytic study. *Journal of Adolescent Research*. 1999; 14:405–426.
- National Indian Gambling Commission. [September 2, 2009] Growth in gaming revenues; and PR-113 06-2009. 2009. from [www.nigc.gov](http://www.nigc.gov)
- National Opinion Research Center. *Gambling impact and behavior study*. Author; Chicago: 1999.
- Oetting ER, Beauvais F. Orthogonal cultural identification theory: The cultural identification of minority adolescents. *The International Journal of the Addictions*. 1991; 25(5a & 6a):655–685. [PubMed: 2101397]
- Peacock TD, Day PA, Peacock RB. At what cost the social impact of American Indian gaming. *Journal of Health and Social Policy*. 1999; 10:23–33. [PubMed: 10538184]
- Petry NM, Stinson FS, Grant BF. Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: Results from the national epidemiologic survey on alcohol and related conditions. *Journal of Clinical Psychiatry*. 2005; 66:564–574. [PubMed: 15889941]
- Phinney J. The multigroup ethnic identity measure: A new scale for use with diverse groups. *Journal of Adolescent Research*. 1992; 7:156–176.
- Raylu N, Oei TP. Role of culture in gambling and problem gambling. *Clinical Psychology Review*. 2004; 23(8):1087–1114. [PubMed: 14729424]
- Robins, L.; Marcus, L.; Reich, W.; Cunningham, R.; Gallagher, T. NIMH diagnostic interview schedule—Version IV (DIS-IV). Department. of Psychiatry, Washington University School of Medicine; St. Louis: 1996.
- Schaap JI. The growth of the Native American gaming industry: What has the past provided, and what does the future hold? *American Indian Quarterly*. 2010; 34(3):365–389. [PubMed: 20677383]
- Substance Abuse and Mental Health Services Administration. *Results from the 2008 National Survey on Drug Use and Health: National findings*. 2009Rockville, MD (Office of Applied Studies, NSDUH Series H-36, HHS Publication No. SMA 09-4434).
- Szlemko WJ, Wood JW, Thurman PJ. Native Americans and alcohol: Past, present, and future. *The Journal of General Psychology*. 2006; 133(4):435–451. [PubMed: 17128961]
- Thomas AC, Bates G, Moore S, Kyrios M, Meredyth D, Jessop G. Gambling and the multidimensionality of accessibility: More than just proximity to venues. *International Journal of Mental Health and Addiction*. 2011; 9(1):88–101.
- U.S Census Bureau. *American FactFinder. S0201 Selected Population Profile in the United States. 2013 American Community Survey 1-Year Estimates*. 2013
- Volberg RA, Abbott MW. Gambling and problem gambling among indigenous peoples. *Substance Use and Misuse*. 1997; 32:1525–1538. [PubMed: 9336863]
- Welte JW, Barnes GM, Tidwell M-CO, Hoffman JH, Wieczorek WF. Gambling and problem gambling in the United States: Changes between 1999 and 2013. *Journal of Gambling Studies*. 2014 doi:10.1007/s10899-014-9471-4.
- Welte JW, Barnes GM, Tidwell M-CO, Hoffman JH. Gambling and problem gambling across the lifespan. *Journal of Gambling Studies*. 2011; 27:49–61. [PubMed: 20499144]
- Welte JW, Barnes GM, Wieczorek WF, Tidwell M, Parker J. Alcohol and gambling pathology among US adults: Prevalence, demographic patterns and co-morbidity. *Journal of Studies on Alcohol*. 2001; 62:706–712. [PubMed: 11702810]
- Welte JW, Wieczorek WF, Barnes GM, Tidwell M-CO, Hoffman JH. The relationship of ecological and geographic factors to gambling behavior and pathology. *Journal of Gambling Studies*. 2004; 20(4):405–423. [PubMed: 15577275]

- Whitbeck LB, Hoyt DR, Stubben JD, LaFromboise T. Traditional culture and academic success among American Indian children in the upper Midwest. *Journal of American Indian Education*. 2001; 40:49–60.
- Wolfe B, Jakubowski J, Haveman R, Courey M. The income and health effects of tribal casino gaming on American Indians. *Demography*. 2012; 49(2):499–524. [PubMed: 22427279]
- Wynne, HJ. *Introducing the Canadian Problem Gambling Index*. Wynne Resources; Edmonton: 2003.
- Zimmerman MA, Ramirez-Valles J, Washienko KM, Walter B, Dyer S. The development of a measure of enculturation for Native American youth. *American Journal of Community Psychology*. 1996; 24:295–310. [PubMed: 8795263]

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 1**

Tribal affiliation according to Native American sample

| <b>Tribal affiliation</b>        | <b>Native Americans in SOGUS2</b> | <b>Native Americans in SONAG</b> | <b>Totals</b> |
|----------------------------------|-----------------------------------|----------------------------------|---------------|
| Apache                           | 1                                 | 8                                | 9             |
| Cherokee                         | 5                                 | 89                               | 94            |
| Chippewa                         | 37                                | 1                                | 38            |
| Chickasaw                        | 0                                 | 3                                | 3             |
| Chocktaw                         | 2                                 | 26                               | 28            |
| Creek                            | 0                                 | 3                                | 3             |
| Iroquois                         | 1                                 | 63                               | 64            |
| Lumbee                           | 24                                | 1                                | 25            |
| Navajo                           | 5                                 | 42                               | 47            |
| Pueblo, Hopi, Zuni               | 0                                 | 6                                | 6             |
| Sioux                            | 27                                | 1                                | 28            |
| Alaskan Athabascan               | 1                                 | 0                                | 1             |
| Eskimo                           | 3                                 | 1                                | 4             |
| Cheyenne                         | 6                                 | 2                                | 8             |
| Warm Springs (Oregon)            | 9                                 | 0                                | 9             |
| Kiowa                            | 0                                 | 8                                | 8             |
| Other NA tribe group and unknown | 20                                | 20                               | 40            |
| Totals                           | 141                               | 274                              | 415           |



Table 2

Percent gambled, percent problem gambling (4+ non-redundant symptoms from SOGS, DIS and CPGI), percent drank alcohol and percent alcohol abuse or alcohol dependence in the past year for Native Americans (NA) and the US population (weighted)

| Population group  | % Gambled past year | % Problem gambling (4+ items on 3 scales) | % Drank alcohol past year | % Alcohol abuse or dependence past year |
|---|---------------------|---|---------------------------|---|
| Comparison group  |                     |   |                           |   |
| US sample—not Native Americans (n = 2,925)                    | 77                  | 8   | 68                        | 4.3                                     |
| Native American sample (unweighted n = 415; weighted n = 400) | 80                  | 18  | 47                        | 5.5                                     |
| Grew up on reservation (199)                                  | 84                  | 26  | 44                        | 6.8                                     |
| Did not grow up on reservation (199)                          | 76                  | 12  | 50                        | 4.2                                     |
| Currently lives on reservation (212)                          | 84                  | 24  | 45                        | 5.6                                     |
| Does not live on reservation (188)                            | 75                  | 12  | 50                        | 5.4                                     |
| Alcohol legal on reservation (95)                             | 82                  | 13  | 40                        | 0                                       |
| Alcohol not legal on reservation (117)                        | 85                  | 34  | 49                        | 10                                      |
| Gambling legal on reservation (179)                           | 86                  | 28  | 47                        | 5.6                                     |
| Gambling not legal on reservation (31)                        | 71                  | 6   | 28                        | 5.6                                     |
| Do you speak your NA tribal language...                       |                     |   |                           |   |
| Not at all (128)  | 71                  | 11  | 47                        | 4.4                                     |
| A little (169)  | 89                  | 23  | 51                        | 7.1                                     |
| Moderately well (41)  | 90                  | 17  | 57                        | 6.7                                     |
| Very well (62)  | 66                  | 22  | 33                        | 2.8                                     |
| Do you have a NA name?  |                     |   |                           |   |
| Yes (134)   | 82                  | 24  | 46                        | 6.1                                     |
| No (265)  | 79                  | 15  | 48                        | 5.2                                     |
| Number of NA activities                                       |                     |   |                           |   |
| Low third (0–6) (148)   | 73                  | 11  | 42                        | 1.3                                     |
| Medium third (7–54) (123)                                     | 85                  | 25  | 57                        | 11.2                                    |
| High third (55+) (128)  | 83                  | 21  | 45                        | 4.9                                     |
| Live by NA way of life  |                     |   |                           |   |
| Low third (i.e., not at all) (149)                            | 79                  | 13  | 52                        | 4.2                                     |
| Medium third (108)  | 82                  | 26  | 47                        | 6.6                                     |
| High third (i.e., a lot) (143)                                | 80                  | 19  | 44                        | 6.0                                     |

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

| Population group                   | % Gambled past year | % Problem gambling (4+ items on 3 scales) | % Drank alcohol past year | % Alcohol abuse or dependence past year |
|------------------------------------|---------------------|---|---------------------------|---|
| Live by White American way         |                     |   |                           |   |
| Low third (i.e., not at all) (134) | 78                  | 26  | 41                        | 6.8                                     |
| Medium third (128)                 | 77                  | 16  | 48                        | 4.1                                     |
| High third (i.e., a lot) (135)     | 85                  | 13  | 53                        | 5.7                                     |
| Native American identity           |                     |   |                           |   |
| Low quartile (102)                 | 81                  | 17  | 54                        | 6.8                                     |
| Second quartile (116)              | 79                  | 21  | 47                        | 0.7                                     |
| Third quartile (89)                | 87                  | 21  | 54                        | 12.0                                    |
| High quartile (93)                 | 74                  | 14  | 35                        | 3.9                                     |

Logistic regressions with any gambling and problem gambling in the past year as the dependent variables and demographic factors and Native American factors as the independent variables

**Table 3**

| Predictor  | Any gambling past year odds ratio and <i>p</i> value | Problem gambling past year odds ratio and <i>p</i> value |
|--|--|--|
| Gender (M = 1; F = 0)  | 1.09   | 1.25   |
| Age (18+ years)  | 0.98**   | 0.99   |
| Socio-economic status  | 0.85   | 0.76*  |
| NA orientation—composite scale                                       | 1.29   | 1.51*  |
| Live by white way  | 1.25   | 0.67*  |
| Gambling convenience (self-report)                                   | 1.51*  | 1.80**   |
| Casino within 30 miles (1 = Yes; 0 = No) geo-coded distance variable | 1.61   | 0.99   |

\*\*\*  $p < 0.001$

\*  $p < 0.05$

\*\*  $p < 0.01$

**Table 4**

Logistic regressions with any alcohol and alcohol abuse/dependence in the past year as the dependent variables and demographic factors and Native American factors as the independent variables

| Predictor  | Any alcohol past year odds ratio and <i>p</i> value | Alcohol abuse/dependence past year odds ratio and <i>p</i> value |
|--|---|--|
| Gender (M = 1; F = 0)  | 1.47  | 1.75   |
| Age (18+ years)  | 0.97***   | 0.94**   |
| Socio-economic status  | 1.04  | 0.70   |
| NA orientation—composite scale                                       | 0.83  | 1.11   |
| Live by white way  | 1.29  | 1.01   |
| Gambling convenience (Self-report)                                   | 1.10  | 0.88   |
| Casino within 30 miles (1 = Yes; 0 = No) geo-coded distance variable | 1.24  | 1.64   |

\*  $p < 0.05$

\*\*

$p < 0.01$

\*\*\*

$p < 0.0001$