

Gambling among Minnesota Native American Public School Students

Randy Stinchfield, Ph.D.

Department of Psychiatry, University of Minnesota Medical School

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SCHOOL STUDENTS

Abstract

The specific aims of this study were fourfold. First, compare the three groups, Native American (NA) Alone, Native American mixed race, and White students on 2010 rates of gambling frequency on six different forms of gambling as well as any gambling, frequent gambling, and underage gambling on legalized forms of gambling. Second, compare gambling trends over time, from 1992 to 2010, for the Native American Alone group, specifically comparing rates of any gambling, frequent gambling, and underage gambling. Third, identify the correlates of gambling among Native American Alone youth. Fourth, compare the three groups on endorsement of two problem gambling items, last administered in 2004, and compare rates of endorsement of these two items over time, from 1992 to 2004. The data is drawn from the Minnesota Student Survey (MSS) administered to 9th and 12th grade public school students. The 2010 MSS sample includes 482 male and 391 female students who identify themselves as American Indian alone; 1,063 male and 1,332 female students who identify themselves as American Indian and one or more other race; and 29,437 male and 31,225 female students who identify themselves as White. Six additional MSS Native American Alone student samples were analyzed to examine changes over time, including 1992 (n = 725), 1995 (n = 600), 1998 (n = 605), 2001 (n = 664), 2004 (n = 798), and 2007 (n = 887). Students were administered the Minnesota Student Survey, a 126-item, anonymous, self-administered, paper-and-pencil questionnaire that inquires about multiple health-related content domains, including gambling behavior. More Native American Alone students gambled than Native American Mixed race students, and more Native American Mixed race students gambled than White students. Gambling participation among Native American Alone students has shown a gradual and consistent decline from 1992 to 2010. More Native American Alone students gamble frequently

than either Native American mixed race or White students. Rates of frequent gambling have been relatively stable with recent declines from 2004 to 2010. More underage Native American Alone students gamble on legalized games than either Native American mixed race or White students. Underage lottery play has shown significant declines from 1992 to 2010, while casino and online gambling have remained stable. A number of correlates combined to explain one-third of the variance in Native American gambling and these correlates included other risky behaviors such as tobacco use, alcohol use, running away from home, antisocial behaviors, and sexual behavior. Native American Alone students exhibited higher endorsement rates of problem gambling items than either Native American Mixed Race or White students.

Keywords: Native American youth gambling; Native American adolescent gambling; Native American teenage gambling

Gambling among Minnesota Native American Public School Students from 1992 to 2010

The expansion of commercial gambling in North America over the past three decades has resulted in widespread exposure of youth to gambling and its promotion. Gambling has moved out of Las Vegas and Atlantic City, to the corner convenience store, the internet, and onto the reservations of many Native American (NA) communities. Commercial gambling expansion in Minnesota started around 1990 and includes more than 3,000 state lottery outlets, over 3,000 charitable gambling sites, two racetracks with card rooms, and Minnesota's 11 Native American tribes operate 18 tribal casinos. This is a significant societal shift where gambling, once viewed as a vice is now viewed as entertainment. This shift in societal attitudes undoubtedly has an effect upon youth given that this is the first generation of youth to grow up with commercial gambling and its promotion (Stinchfield & Winters, 1998). The graduating high school class of 2010 was born a couple years after the introduction of the Minnesota state lottery and introduction of tribal casinos in 1990. Some youth in Minnesota celebrate their 18th birthday, the legal age for gambling in Minnesota, by gambling at a tribal casino.

In the 2010 US Census, 60,916 Minnesotans identified themselves as American Indian only, and an additional 40,984 identified themselves as American Indian and another race for a total of 101,900, and this represents 2% of the Minnesota population of 5.3 million people (www.demography.state.mn.us). Of these 101,900 Minnesota Native Americans, 39,531 live on reservation or off-reservation trust land. The Native American population of Minnesota is made up primarily of seven Anishinaabe (also known as Ojibwe or Chippewa) communities located in the northern half of Minnesota and four Dakota (also known by the French name of Sioux) communities in the southern half of Minnesota. The 2010 US Census count of Minnesota American Indian alone youth population (ages 10-19) was 10,954 (Minnesota Department of

Health, 2012). This is considered an underestimate of the number of MN adolescent with American Indian heritage since many of these youth identify with more than one race.

There are two issues that make the study of gambling among Native American youth of particular interest. First, gambling can become an addiction and Native Americans have higher rates of addiction than the general population, particularly alcohol and other drug abuse and dependence (Peacock, Day, & Peacock, 1999). This finding has made the prevention and treatment of addictions on Native American reservations a public health priority for tribal, county, state, and federal public health agencies. Second, tribal gambling has brought economic development to some reservations, even being referred to as the “New Buffalo” for some Native American communities (Treuer, 2012; Wardman, el-Guebaly, & Hodgins, 2001). Tribal gambling has improved the lives of many tribal members and communities and has also brought access to Las Vegas-style casino gambling to tribal members. A concern of tribal elders is the amount of time and money spent by tribal members in tribal casinos and the risk of gambling addiction (Treuer, 2012). Not all Native American communities have prospered from tribal gambling. Those Native American communities near large metropolitan areas have benefitted more from tribal gambling than those Native American communities located far away from metropolitan areas. Gambling on reservations may be viewed as a two-edged sword. On the one hand, gambling has provided much needed economic development for some tribal communities and improved the lives of tribal members. On the other hand, some tribal members gamble in tribal casinos and risk becoming addicted to casino games. And what about gambling among Native American youth?

There have been four studies on gambling among Native American and First Nations youth (Wardman, el-Guebaly, & Hodgins, 2001). One study was conducted in Alberta, Canada

and the other three were conducted in Minnesota. In the earliest study, Hewitt and Auger (1995) administered the SOGS-RA to 1,000 aboriginal students in grades 5-12 (average age of 14 years) in 28 schools located throughout Alberta, Canada. They reported that 89% gambled for money in the past year. Bingo was the most prevalent game played (57%), followed by cards (49%), scratch tabs (48%), sports betting (42%), and games of personal skill (35%). Games played frequently, that is, weekly or more often, include sports betting (13%), bingo (12%), cards (10%), video games for money (10%). Using the broad scoring algorithm for the SOGS-RA (Winters, Stinchfield & Fulkerson, 1993), 28% were found to be problem gamblers and 21% were “at risk” gamblers. Problem gamblers were more likely to be boys (65%) than girls (35%). This rate of problem gambling was more than three times higher than the rate reported in the general youth population in Alberta (Wynne, Smith, & Jacobs, 1996) where the SOGS was used. At least part of this difference in prevalence rates between the two studies is likely due to the use of different instruments and the use of the broad scoring algorithm rather than the narrow scoring algorithm for the SOGS-RA (Stinchfield, 2010; Winters, Stinchfield, & Kim, 1995). The SOGS-RA broad scoring algorithm is based on gambling frequency and SOGS-RA score. Gambling daily regardless of SOGS-RA score; or gambling once a week or more and a SOGS-RA score of two or more indicates problem gambling. The SOGS-RA narrow scoring algorithm uses a cut score of four or more to indicate problem gambling. The SOGS-RA broad scoring algorithm results in higher prevalence rates than the narrow scoring algorithm.

In the second study, Zitzow (1996) compared gambling behaviors of Native American students (n=115) to non-Native American students (n=161) who were in grades 9-12 (age range 14-19) and resided within or near one Minnesota Native American reservation. Zitzow compared those students who claimed any degree of Native American heritage to those students

who did not claim any Native American heritage. He administered an adolescent gambling survey in class that included gambling frequency, SOGS, DSM-III-R symptoms of Pathological Gambling, and GA-20. He found that Native American students had begun to gamble earlier, gambled more frequently, and had higher scores on the SOGS than their non-Native American peers. The Native American students had a significantly higher rate of problem gambling (9.6%) than the non-Native American students (5.6%), based on the SOGS. Zitzow concluded that Native American youth may be at greater risk of developing gambling problems due to a number of factors including their higher level of exposure to gambling, lower SES, cultural acceptance of beliefs about luck and fate, minority status, and a resulting perceived lack of control over personal destiny. Gambling has historically played a significant role in tribal life and many Native American youth have greater exposure to gambling than non-Native American youth. Zitzow (1996) recommended that further research should examine variables and behaviors associated with Native American youth gambling.

In the third study, using the 1992 and 1995 Minnesota Student Survey (MSS), Stinchfield, Cassuto, Winters and Latimer (1997) reported that Native American youth ($n = 1,584$ in 1992; $n = 1,832$ in 1995) had rates of frequent gambling similar to African American and Mexican American youth, but higher than White and Asian American youth. This study showed preliminary evidence that Native American youth were more involved in gambling than their non-Native American peers.

In the fourth study, Peacock, Day and Peacock (1999) conducted a replication of the Zitzow (1996) study using the same instrument, hypothesis, and methodology on the same reservation in Minnesota. The hypothesis was as follows: "When depression, poverty, unemployment, the high rate of school drop outs, increasing drug use, the high suicide rate, and

the myriad other problems that plague isolated Indian reservations are added to the equation, one would expect to find a higher rate of problem and pathological gambling behaviors among the adolescent Indian population than among non-Indian adolescents” (pp. 8-9). They administered Zitzow’s adolescent gambling survey to a sample attending a reservation secondary school (n=89) and to a sample attending a non-reservation public secondary school (n=96) near the reservation. From this sample of 185 students, 130 were self-identified as Native American and 54 as non-Native American. The Native American student sample had a higher rate of problem gambling (10.1%) than the non-Native American student sample (2.2%), using the SOGS. Peacock, Day and Peacock (1999) concluded, “Native American youth are at greater risk for developing gambling behaviors and problematic gambling than their non-Indian peers.” (p. 12).

These four studies show early efforts to look at gambling among Native American youth and suggest that Native American youth exhibit higher rates of gambling and problem gambling than their non-Native American peers and therefore further research is warranted. Three of these studies had relatively small sample sizes and none looked at gambling trends over time. The literature on Native American youth gambling is limited, and further studies are needed to increase our understanding of gambling among Native American youth in order to formulate prevention efforts to reduce the development of problem gambling and thus improve the health of Native American youth.

This study has four specific aims. First, compare the three groups, Native American Alone, Native American mixed race, and White students on 2010 rates of gambling frequency on six different forms of gambling as well as any gambling, frequent gambling, and underage gambling on legalized forms of gambling. Second, show gambling trends from 1992 to 2010, specifically comparing rates of any gambling, frequent gambling, and underage gambling.

Third, identify the correlates of gambling among Native American Alone youth. Fourth, compare the three groups on endorsement of two problem gambling items, last administered in 2004, and compare rates of endorsement of these two items over time, from 1992 to 2004.

Method

Participants. This study used Minnesota Student Survey (MSS) data. The survey question about the student's race allows students to endorse one or more races from a list. This study compared three groups from the 2010 MSS: (a) those students who identified themselves as American Indian alone (n = 873); (b) those students who identified themselves as American Indian and one or more other race (n = 2,395); and (c) students who identified themselves as White alone (n = 60,662). Some students identified themselves as Native American Alone, while others identified themselves as Native American and one or more other race. The decision to include two Native American samples was based upon previous studies, such as Zitzow (1996), and upon consultation with Dr. Thomas Peacock, member of the Fond du Lac Band of Chippewa, and Associate Dean, College of Education and Human Service Professions University of Minnesota, Duluth. Of the 2,395 students who identified themselves as Native American and one or more other race, thus Native American mixed race, the number reporting two races was 1,760, three races was 507, four races was 119 and nine students reported having five races. Of the Native American mixed race group, the other races were, in order of proportion, White, Black/African American, Hispanic/Latino, and Asian American. The White student group was included as a comparison group representing the majority of Minnesota public school students. Demographics of the three groups are presented in Table 1.

There are some differences in demographics between the three groups. There is a smaller proportion of 12th graders in the Native American Alone (34.1%) and Native American Mixed

Table 1

Demographic Characteristics of 2010 Native American (NA) Alone, NA Mixed race, and White Samples

Demographic Variable	NA Alone N = 873 N (%)	NA Mixed N = 2,395 N (%)	White N = 60,662 N (%)	NA Alone vs. NA Mixed X^2 (p)	NA Alone vs. White X^2 (p)	NA Mixed vs. White X^2 (p)
Gender						
Boys	482 (55.2)	1,063 (44.4)	29,437 (48.5)	30 (<.001)	15 (<.001)	16 (<.001)
Girls	391 (44.8)	1,332 (55.6)	31,225 (51.5)			
Grade						
9 th Grade	575 (65.9)	1,618 (67.6)	32,972 (54.4)	1 (.36)	46 (<.001)	162 (<.001)
12 th Grade	298 (34.1)	777 (32.4)	27,690 (45.6)			
Age within Grade						
9th Grade						
14	180 (31.3)	535 (33.1)	11,128 (33.7)	3.2 (.36)	67 (<.001)	140 (<.001)
15	359 (62.4)	995 (61.5)	21,276 (64.5)			
16	36 (6.3)	83 (5.1)	562 (1.7)			
17	0	5 (0.3)	6 (0.0)			
12th Grade						
16	2 (0.7)	1 (0.1)	39 (0.1)	8 (.05)	54 (<.001)	19 (<.001)
17	92 (30.9)	268 (34.5)	9,724 (35.1)			
18	184 (61.7)	480 (61.8)	17,487 (63.2)			
19-20	20 (6.7)	28 (3.6)	440 (1.6)			
Live with both biological parents	258 (29.6)	909 (38.0)	41,243 (68.0)	20 (<.001)	579 (<.001)	938 (<.001)
Free/Reduced price lunch at school	464 (54.3)	1,088 (46.1)	9,554 (15.9)	17 (<.001)	902 (<.001)	1,458 (<.001)
Individualized Education Plan (IEP)	220 (26.3)	582 (25.1)	8,216 (14.0)	0 (.50)	103 (<.001)	224 (<.001)
Residence						
Minneapolis/Saint Paul Metropolitan area	284 (32.5)	1,309 (54.7)	29,681 (48.9)	125 (<.001)	93 (<.001)	30 (<.001)
Greater Minnesota	589 (67.5)	1,086 (45.3)	30,981 (51.1)			

race (32.4%) groups than the White group (45.6%) and this may reflect a higher dropout rate by 12th grade among Native American Alone and Native American Mixed race students. There is a lower proportion of students living with both biological parents in the Native American Alone (29.6%) and Native American Mixed race (38%) groups than the White (68%) group. There was a higher proportion of Native American Alone (54.3%) and Native American Mixed race (46.1%) students who received free or reduced price lunch at school as compared to White students (15.9%). There was a higher proportion of Native American Alone (26.3%) and Native American Mixed race (25.1%) students who had an Individualized Education Plan (IEP) than White students (14%). All three groups differed on residence in the Minneapolis/Saint Paul metropolitan area with Native American Alone (32.4%) had the smallest proportion followed by Whites (48.9%) and Native American Mixed race (54.6%) had the highest proportion. This difference may reflect a greater proportion of Native American Alone students who live on tribal reservations in the greater Minnesota rural area.

Six additional MSS Native American Alone public school student samples were analyzed to examine changes over time, including 1992 (n = 725), 1995 (n = 600), 1998 (n = 605), 2001 (n = 664), 2004 (n = 798), and 2007 (n = 887). Five additional MSS Native American mixed race public school student samples were analyzed to examine changes of time, including 1995 (n = 1,508), 1998 (n = 1,555), 2001 (n = 1,670), 2004 (n = 1,812), and 2007 (n = 2,443). The 1992 MSS did not allow students to choose more than one race, so there is no Native American mixed race sample in 1992. Six additional MSS White student samples were analyzed as comparison groups over time, including 1992 (n = 68,152), 1995 (n = 64,616), 1998 (n = 68,247), 2001 (n = 68,165), 2004 (n = 64,738), and 2007 (n = 65,463).

Instrument. The 2010 Minnesota Student Survey (MSS) is a 126-item, anonymous, self-

administered, paper-and-pencil questionnaire developed by the Minnesota Student Survey Interagency Team (2010a). Content domains include demographics, school problems, school violence/safety, activities, health, mental health, nutrition, family relationships, emotional distress, suicidal behavior, antisocial behaviors, family alcohol/drug problems, physical/sexual abuse, gambling behavior, communication with parents, alcohol/drug and tobacco use behaviors, sources of alcohol/drugs/tobacco, substance use diagnostic criteria, sexual behavior, dating violence, and pregnancy.

The 2010 MSS included six gambling activity frequency items. The preface for all six items is: "During the last 12 months, how often have you done these activities?". The six items included: (a) Played cards for money; (b) Bet money on games of personal skill like pool, golf or bowling; (c) Bet money on sports teams or horse racing; (d) Bought lottery tickets or scratch offs; (e) Gambled in a casino; and (f) Gambled for money online. Each gambling frequency item has the following five response options: (a) Not at all; (b) Less than once a month; (c) About once a month; (d) About once a week; and (e) Daily. Two problem gambling items were included in the MSS from 1992 to 2004: (a) During the last 12 months, have you ever felt bad about the amount you bet, or about what happens when you bet money?; and (b) During the last 12 months, have you ever felt that you would like to stop betting money but didn't think you could? These two problem gambling items had the following three response options: (a) Yes; (b) No; and (c) I don't bet for money. The gambling frequency items and the two problem gambling items were adapted from the South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA) (Winters, Stinchfield, & Fulkerson, 1993; Winters, Stinchfield, & Kim, 1995). While the MSS does not have an item on socioeconomic status, there is an item asking if the student gets free or reduced-price lunch at school and this item is used as a proxy for socioeconomic status and is

shown in Table 1. Academic achievement and functioning is shown in Table 1 by the item as to whether the student has ever had an Individualized Education Plan (IEP) which indicates if the student has had problems in academic progress and needed additional educational assistance.

Procedure. The MSS is administered under the auspices of the Minnesota Student Survey Interagency Team (2010a), a collaboration of the following four Minnesota State departments: Education; Health; Human Services; and Public Safety. The Minnesota Department of Education has administered the MSS, an alcohol and drug use risk survey, to Minnesota 6th, 9th, and 12th grade public school students every three years starting in 1989. Gambling items were introduced in the 1992 survey. The gambling items were deleted from the 6th grade survey after the 1992 administration.

Survey participation by school districts is voluntary, however, most districts participate and the rate of participation by Minnesota public school districts was 295 out of 335 (88%) in the 2010 survey (Minnesota Student Survey Interagency Team, 2010b). The data set was cleaned of students with highly inconsistent or improbable responses (3%) which suggest invalid responding. To be included in the sample for this study, students had to answer gender, grade, and age; and one or more of the six gambling items. A comprehensive description of the survey methodology is provided elsewhere (Minnesota Student Survey Interagency Team, 2010c).

The MSS was administered to 9th and 12th grade students in classroom settings in the presence of school personnel in public schools, charter schools, and tribal schools. The data were collected by the Minnesota Department of Education. A passive consent procedure was used by sending a letter home with students to parents (or guardians) that described the questionnaire and directed parents that unless they contacted the school to exclude their child from the survey, the student would be asked to complete the survey. At the time of

administration, students were instructed that their participation was voluntary, they did not have to complete the survey, they could quit at any time and they could skip items if they chose to. Most students completed the survey and it is unknown how many students refused to participate. The students were assured of the anonymity and confidentiality of the MSS.

Statistical Analysis. Frequencies including count and percentages were computed for each analysis and chi-squares between pairs were computed for comparisons of the three groups. For the examination of gambling trends over time, the reporting method used by the Monitoring the Future reports (Johnston, O'Malley, Bachman, & Schulenberg, 2009) of showing rates of substance use for all years of the surveys and computing a test of the difference between proportions for the last two surveys, was used in this report. The proportions of the sample for each form of gambling at each of the seven assessments was computed for the entire sample and broken down by gender and grade groups. The comparison of the two most recent surveys (2007 and 2010) in the series indicates current changes in gambling rates. This comparison addresses the question, Are youth gambling more, less, or about the same as the last survey? To test for statistically significant differences, the z-ratio for the significance of the difference between two independent proportions was computed. Gambling rates were also plotted on line charts to give a visual representation of the direction of changes in gambling rates from 1992 to 2010. To identify correlates of gambling, a single gambling variable was computed by summing the six gambling frequency items. The large pool of MSS variables were correlated with this gambling variable and any bivariate correlation of $r = .25$ or greater was included in a multiple regression. Because gender has a large effect on gambling frequency, separate multiple regressions were computed for males and females.

Results

The results section is divided into the four specific aims. First, compare the three groups, Native American Alone, Native American mixed race, and White students on 2010 rates of gambling frequency on six different forms of gambling as well as any gambling, weekly/daily gambling, and underage gambling on legalized forms of gambling. Second, compare gambling trends over time, from 1992 to 2010, specifically comparing rates of any gambling, weekly/daily gambling, and underage gambling. Third, identify the correlates of gambling among Native American Alone youth in 2010. Fourth, compare the three groups on endorsement of two problem gambling items, last administered in 2004, and compare rates of endorsement of these two items over time, from 1992 to 2004.

Comparison of Native American Alone, Native American mixed race, and White Students on 2010 rates of gambling

Rates of gambling frequency in 2010 for the three groups and for each game are shown in Table 2. More Native American Alone students gambled than Native American Mixed race and White students; and more Native American Mixed race students gambled than White students. Native American Alone students tended to exhibit more frequent gambling than both Native American Mixed race students and White students; and the Native American Mixed race students tended to exhibit more frequent gambling than White students. More than half (58.8%) of Native American Alone students gambled in the past year as compared to less than half of Native American Mixed race (47.3%) and White Students (45.2%). In terms of games, the most common games played by all three groups were cards for money and betting money on games of personal skill. The least common forms of gambling were gambling in a casino and gambling for money online.

Table 2

Comparison of Native American (NA) Alone, Native American (NA) mixed race, and White Students on Gambling Frequency for each Game in 2010

Gambling Frequency	Groups		
	NA Alone %	NA Mixed %	White %
Played Cards for Money			
Not at all	63.6	71.2	73.8
Less than Monthly	17.0	16.5	16.4
Monthly	9.5	7.1	6.3
Weekly	5.1	3.3	2.4
Daily	4.8	1.8	1.0
Bet money on games of personal skill like pool, golf or bowling			
Not at all	63.9	74.5	78.2
Less than Monthly	16.9	13.5	13.2
Monthly	9.7	6.4	5.3
Weekly	5.1	3.5	2.3
Daily	4.4	2.1	1.0
Bet money on sports teams			
Not at all	71.8	79.5	82.0
Less than Monthly	10.8	10.9	11.6
Monthly	8.2	5.1	4.0
Weekly	4.9	2.8	1.6
Daily	4.3	1.7	0.8

Bought lottery tickets or scratch offs			
Not at all	70.6	81.8	80.4
Less than Monthly	12.5	10.1	11.6
Monthly	8.2	4.2	4.6
Weekly	4.4	2.2	2.5
Daily	4.2	1.6	0.9
Gambled in a casino			
Not at all	78.5	87.5	86.1
Less than Monthly	8.2	6.5	8.1
Monthly	5.8	3.5	3.6
Weekly	3.2	1.4	1.4
Daily	4.3	1.1	0.8
Gambled for money online			
Not at all	90.5	95.9	97.0
Less than Monthly	2.9	1.3	1.1
Monthly	1.9	0.8	0.6
Weekly	1.0	0.6	0.5
Daily	3.7	1.4	0.7
Highest level of gambling across all games			
Not at all	41.2	52.7	54.8
Less than Monthly	21.8	24.1	26.3
Monthly	17.3	12.3	11.1
Weekly	10.4	7.1	5.7
Daily	9.3	3.7	2.2

Note. Highest level of gambling is the highest frequency of play, across all six games, for each student. Column percentages may not total 100% due to rounding to the tenth decimal place.

Table 3

Comparison of Native American (NA) Alone, Native American (NA) mixed race, and White Students on Any Gambling in the past year for each Game and by Gender in 2010

Game	NA Alone %	NA Mixed %	White %	NA Alone vs NA Mixed X^2 (p)	NA Alone vs. White X^2 (p)	NA Mixed vs. White X^2 (p)
Any game all students	58.8	47.3	45.2	34 (<.001)	64 (<.001)	4 (.05)
Any game Boys	68.7	62.0	59.4	6 (.01)	17 (<.001)	3 (.09)
Any game Girls	46.5	35.5	31.9	16 (<.001)	38 (<.001)	8 (.006)
Any game 9 th Grade Students	52.3	41.4	35.3	21 (<.001)	72 (<.001)	25 (<.001)
Any game 12 th Grade Students	71.1	59.5	57.0	13 (<.001)	24 (<.001)	2 (.18)
Played Cards for Money	36.4	28.8	26.2	18 (<.001)	47 (<.001)	8 (.004)
Bet money on games of personal skill like pool, golf or bowling	36.1	25.5	21.8	35 (<.001)	102 (<.001)	19 (<.001)
Bet money on sports teams	28.2	20.5	18.0	21 (<.001)	60 (<.001)	10 (.002)
Bought lottery tickets or scratch offs	29.4	18.2	19.6	47 (<.001)	51 (<.001)	3 (.09)
Gambled in a casino	21.5	12.5	13.9	40 (<.001)	41 (<.001)	3 (.06)
Gambled for money online	9.5	4.1	3.0	35 (<.001)	122 (<.001)	10 (.002)
Boys						
Played Cards for Money	49.6	43.6	40.6	5 (.03)	16 (<.001)	4 (.05)

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Bet money on games of personal skill like pool, golf or bowling	47.8	40.4	35.5	7 (.006)	31 (<.001)	11 (.001)
Bet money on sports teams	37.6	32.3	28.4	4 (.04)	19 (<.001)	7 (.007)
Bought lottery tickets or scratch offs	34.8	22.3	24.0	26 (<.001)	29 (<.001)	2 (.21)
Gambled in a casino	27.7	16.7	17.7	25 (<.001)	32 (<.001)	1 (.41)
Gambled for money online	14.2	7.1	5.4	20 (<.001)	70 (<.001)	6 (.01)
Girls						
Played Cards for Money	20.3	17.0	12.5	2 (.13)	21 (<.001)	23 (<.001)
Bet money on games of personal skill like pool, golf or bowling	21.6	13.7	8.9	14 (<.001)	76 (<.001)	36 (<.001)
Bet money on sports teams	16.8	11.3	8.1	8 (.004)	38 (<.001)	16 (<.001)
Bought lottery tickets or scratch offs	22.8	14.9	15.4	13 (<.001)	16 (<.001)	0 (.59)
Gambled in a casino	14.0	9.2	10.3	7 (.007)	5 (.02)	2 (.21)
Gambled for money online	3.9	1.7	0.8	6 (.01)	47 (<.001)	15 (<.001)

Note. "Any Gambling" is any gambling across all six games. Bold indicates statistical significance of alpha < .01.

Table 4

Comparison of Native American (NA) Alone, Native American (NA) mixed race, and White Students on Weekly/Daily Gambling Frequency for each Game and by Gender in 2010

Game	NA Alone %	NA Mixed %	White %	NA Alone vs. NA Mixed X^2 (p)	NA Alone vs. White X^2 (p)	NA Mixed vs. White X^2 (p)
Any game all students	19.7	10.9	7.8	44 (<.001)	164 (<.001)	28 (<.001)
Any game Boys	25.5	17.6	13.2	13 (<.001)	61 (<.001)	17 (<.001)
Any game Girls	12.5	5.5	2.8	23 (<.001)	132 (<.001)	34 (<.001)
Any game 9 th Graders	16.9	10.2	5.4	18 (<.001)	141 (<.001)	67 (<.001)
Any game 12 th Graders	25.2	12.2	10.8	27 (<.001)	63 (<.001)	2 (.19)
Played cards for money	9.9	5.1	3.5	25 (<.001)	104 (<.001)	18 (<.001)
Games of personal skill	9.4	5.6	3.3	15 (<.001)	101 (<.001)	39 (<.001)
Bet money on sports teams	9.2	4.5	2.3	25 (<.001)	166 (<.001)	45 (<.001)
Bought lottery tickets	8.7	3.8	3.4	30 (<.001)	70 (<.001)	1 (.23)
Gambled in a casino	7.5	2.6	2.2	41 (<.001)	109 (<.001)	2 (.18)
Gambled online	4.8	2.1	1.2	17 (<.001)	85 (<.001)	13 (<.001)
Boys						

Youth Gambling 21

Played cards for money	13.3	8.9	6.3	7 (.009)	38 (<.001)	12 (.001)
Games of personal skill	14.2	9.8	6.1	6 (.01)	53 (<.001)	25 (<.001)
Bet money on sports teams	12.4	8.4	4.3	6 (.01)	73 (<.001)	39 (<.001)
Bought lottery tickets	10.9	5.4	5.4	15 (<.001)	26 (<.001)	0 (.99)
Gambled in a casino	10.2	4.6	3.6	18 (<.001)	56 (<.001)	2 (.12)
Gambled online	6.8	3.5	2.2	8 (.004)	45 (<.001)	8 (.004)
Girls						
Played cards for money	5.6	2.0	0.7	14 (<.001)	115 (<.001)	26 (<.001)
Games of personal skill	3.6	2.3	0.6	2 (.14)	53 (<.001)	52 (<.001)
Bet money on sports teams	5.2	1.4	0.5	19 (<.001)	149 (<.001)	21 (<.001)
Bought lottery tickets	6.0	2.6	1.5	11 (.001)	51 (<.001)	10 (.001)
Gambled in a casino	4.1	1.0	0.8	18 (<.001)	54 (<.001)	1 (.39)
Gambled online	2.3	0.9	0.3	5 (.03)	46 (<.001)	13 (<.001)

Note. Highest level of gambling is the highest frequency of play, across all six games, for each student. That is, what percent were playing on a weekly or daily basis for any one of the six games. Bold indicates statistical significance of alpha < .01.

A comparison of all three groups on “any gambling in the past year” is shown in Table 3. Each pair of groups is compared with a chi-square statistic. More Native American Alone students gambled than Native American Mixed race or White students and nearly all of these comparisons were statistically significant. Most comparisons between Native American Mixed race and White students showed statistically significantly higher rates of gambling for the Native American Mixed race students, except for lottery and casino, where slightly more White students played these games than Native American Mixed race students, however, the difference did not reach statistical significance. In general, more Native American Alone students gambled than Native American Mixed race and White students, whereas, the comparison between Native American Mixed race and White students showed a mix of differences and similarities in rates of gambling. Other findings from Table 3 across all three groups are that more boys gambled than girls and more 12th grade students gambled than 9th grade students. For boys, the most common forms of gambling across all three groups were playing cards for money and betting on games of personal skill. For girls, the most common forms of gambling across all three groups were lottery games and playing cards. Gambling online was the least common form of gambling for all three groups.

A comparison of all three groups on frequent gambling, defined as gambling weekly or daily, is shown in Table 4. In terms of frequent gambling, there were more Native American Alone students gambling frequently than either Native American Mixed race or White students and nearly all comparisons are statistically significant. There were more Native American Mixed race students who were gambling frequently than White students and nearly all of these comparisons are statistically significant with the exception of lottery and casino where the difference did not reach statistical significance. Other findings from Table 4 across all three

groups are that more boys gambled frequently than girls and more 12th grade students gambled frequently than 9th grade students. For boys, the most common forms of frequent gambling across all three groups were playing cards for money and betting on games of personal skill. For girls, the most common forms of frequent gambling across all three groups were lottery games and playing cards. Gambling online was the least common form of frequent gambling for all three groups.

Comparisons of all three groups on underage gambling frequency on legalized games in 2010 are shown in Table 5. Underage gambling is defined as being under the age of 18 and playing a legalized form of gambling, including lottery, casino and online gambling. Table 5 shows that there were more Native American Alone students who played legalized games than Native American Mixed race and White Students and more Native American Mixed race students played legalized games than White students. Lottery games were played by more students in all three groups and more boys played legalized games than girls. These comparisons were put to chi-square tests of statistical significance between pairs of groups and these results are shown in Table 6. More Native American Alone students were engaged in underage gambling than either Native American Mixed race or White students on every comparison; more Native American Mixed race students gambled underage than White students on every comparison; and nearly all of the chi-squares were statistically significant. When the comparisons were broken out by gender, the same pattern emerged. Other findings from Tables 5 and 6 are that more boys were underage gamblers than girls in all three games.

Table 5

Comparison of Native American (NA) Alone, Native American (NA) mixed race, and White Students on Underage Gambling Frequency on Legalized Games by Gender in 2010

Gambling Frequency	Groups		
	NA Alone %	NA Mixed %	White %
Underage Boys Bought Lottery Tickets			
Not at all	75.3	84.9	88.2
Less than Monthly	10.6	7.6	6.2
Monthly	6.9	2.9	2.8
Weekly	2.6	2.1	1.7
Daily	4.6	2.5	1.1
Underage Boys Gambled in a Casino			
Not at all	84.5	91.9	95.7
Less than Monthly	5.7	3.2	1.8
Monthly	2.9	1.7	1.0
Weekly	2.0	1.8	0.5
Daily	4.9	1.3	1.1
Underage Boys Gambled Online			
Not at all	86.0	93.4	95.3
Less than Monthly	4.3	2.2	1.7
Monthly	2.9	1.2	1.0
Weekly	1.4	1.2	0.7
Daily	5.4	2.0	1.3

Underage Girls Bought Lottery Tickets			
Not at all	82.4	91.1	93.3
Less than Monthly	7.2	4.7	4.7
Monthly	5.5	2.3	1.2
Weekly	2.6	1.2	0.6
Daily	2.3	0.8	0.2
Underage Girls Gambled in a casino			
Not at all	93.8	97.6	98.8
Less than Monthly	2.3	1.3	0.8
Monthly	1.0	0.2	0.2
Weekly	1.3	0.3	0.1
Daily	1.6	0.6	0.2
Underage Girls Gambled for money online			
Not at all	96.1	98.3	99.4
Less than Monthly	1.3	0.5	0.3
Monthly	0.6	0.2	0.1
Weekly	0.6	0.1	0.1
Daily	1.3	0.9	0.2

Note. Underage is defined as 17 years of age or less.

Table 6

Comparison of Native American (NA) Alone, Native American (NA) mixed race, and White Students on any Underage Gambling for each Legal Game and by Gender in 2010

Game	NA Alone %	NA Mixed %	White %	NA Alone vs. NA Mixed X^2 (p)	NA Alone vs. White X^2 (p)	NA Mixed vs. White X^2 (p)
Bought lottery tickets	21.4	11.6	9.1	38 (<.001)	116 (<.001)	14 (<.001)
Gambled in a casino	11.1	4.9	2.7	31 (<.001)	168 (<.001)	31 (<.001)
Gambled online	9.3	3.8	2.5	29 (<.001)	115 (<.001)	12 (<.001)
Underage Boys						
Bought lottery tickets	24.7	15.1	11.8	15 (<.001)	54 (<.001)	8 (.005)
Gambled in a casino	15.5	8.1	4.3	15 (<.001)	99 (<.001)	26 (<.001)
Gambled online	14.0	6.6	4.7	17 (<.001)	66 (<.001)	7 (.01)
Underage Girls						
Bought lottery tickets	17.6	8.9	6.7	18 (<.001)	57 (<.001)	8 (.004)
Gambled in a casino	6.2	2.4	1.2	11 (.001)	57 (<.001)	10 (.001)
Gambled online	3.9	1.7	0.6	5 (.02)	47 (<.001)	16 (<.001)

Note. Underage is defined as 17 years of age or less. Bold indicates statistical significance of alpha < .01.

Gambling Trends from 1992 to 2010

Rates of any gambling among Native American Alone students, boys and girls, and broken down by grade and gender and by game from 1992 to 2010 are shown in Table 7. The phrase “any game” refers to any gambling on any of the six gambling items. The main trend is one of modest declines in gambling rates from 1992 to 2010 across nearly all games and a few of the declines from 2007 to 2010 are statistically significant. A comparison of the difference between 2007 and 2010 gambling rates show statistically significant declines for boys; 12th grade boys’ card playing, betting on games of personal skill, and sports betting; and 9th grade girls card playing. There were fewer students gambling in 2010 (59.1%) than were gambling in 1992 (75.7%). There were a few exceptions to the general trend of decline and those were slight increases in lottery, casino and online gambling by 9th grade boys; and slight increase in casino gambling by 12th grade boys and 9th grade girls, however, none of these increases were statistically significant. Figure 1 shows a gradual decline in gambling participation rates from 1992 to 2010 for boys and girls.

Rates of frequent gambling (weekly or daily) for all students, boys, girls, and broken down by gender and grade and by game from 1992 to 2010 are presented in Table 8. There are three important findings in Table 8. First, rates of frequent gambling, although showing some fluctuations and shifts over time, were relatively stable when comparing 1992 to 2010. There was about the same proportion of students gambling frequently in 2010 (19.7%) as there was in 1992 (20.6%). Second, the 2010 survey showed declines from 2007 in most comparisons and some declines were statistically significant, including frequent gambling by boys; card playing and any game by 9th grade boys; betting on games of personal skill, and sports betting by 12th grade boys. Third, there were few instances of increases from 2007 to 2010, however only one

increase in 9th grade girls' casino gambling was statistically significant 2007 to 2010, moving from 1% to 2.8%.

Figure 1 shows that rates of frequent gambling by boys and girls, while showing some fluctuations, have remained relatively stable from 1992 to 2010 for girls, and boys' frequent gambling showed larger fluctuations peaking in 1998 at 44.1% and declining to 25.5% in 2010. Figure 2 shows rates of frequent gambling by 9th grade boys for each game from 1992 to 2010. This figure shows an increase for most games from 1992 to 1998 with subsequent declines from 1998 to 2010 in most games except for casino and online gambling which were stable from 2004 to 2010 at about 5%. Figure 3 shows rates of frequent gambling by 12th grade boys for each game from 1992 to 2010. There was a peak in lottery play in 1998, peaks in card playing and skill games in 2004, and all games showed declines from 2004 to 2010, except for online gambling, which was stable at 5%. Figure 4 shows rates of frequent gambling by 9th grade girls for all games from 1992 to 2010. While rates of frequent gambling for girls were relatively low (less than 10 percent), there was a decline in frequent lottery play from a high of 5% in 1992 to 3% in 2010. Ninth grade girls also showed a peak in card playing in 1998 with subsequent declines. Casino gambling has fluctuated between 1% and 3% and showed an increase from 2007 to 2010. Online gambling showed a significant increase from 2% in 2007 to 6% in 2010. Figure 5 shows rates of frequent gambling by 12th grade girls for all games from 1992 to 2010. Frequent lottery play, sports betting, casino and online gambling have increased from 1992 to 2010, whereas cards and skill games, while fluctuating, have been stable from 1992 to 2010. From 2007 to 2010, 12th grade girls showed declines in frequent gambling on cards, skill games and online, whereas rates were stable for sports betting, lottery and any game.

Table 7

Any gambling in last 12 months for Native American Alone Students, by Gender, and each Game for each Year from 1992 to 2010

Game	1992 N=725 %	1995 N=600 %	1998 N=605 %	2001 N=664 %	2004 N=798 %	2007 N=893 %	2010 N=873 %	Difference 2007 to 2010	Percent Change 2007 to 2010
Any game All Students	75.7	74.8	67.4	65.8	64.5	62.3	58.8	-3.5	-6
Any game Boys	86.8	83.6	79.3	77.5	79.6	74.6	68.7	-5.9*	-8
Any game Girls	64.2	65.4	53.7	52.3	48.8	49.0	46.6	-2.4	-5
9th Grade Boys									
Cards	62.3	67.3	66.2	58.2	62.6	52.0	47.0	-5.0	-10
Skill games	55.2	55.3	60.8	59.0	56.3	50.8	44.6	-6.2	-12
Sports teams	62.7	59.7	58.6	50.8	50.3	41.2	37.1	-4.1	-10
Lottery	43.3	44.2	30.0	26.2	19.2	20.9	22.4	1.5	7
Casino	NA	NA	15.6	16.0	9.6	12.6	13.4	0.8	6
Online	NA	NA	NA	NA	NA	11.4	13.4	2.0	18
Any Game	84.5	82.3	76.8	74.2	76.8	68.3	62.3	-6	-9
12th Grade Boys									
Cards	63.5	67.1	64.4	57.0	65.7	71.2	54.0	-17.2**	-24
Skill games	60.0	57.6	55.2	54.0	63.8	74.1	53.4	-20.7**	-28
Sports teams	53.9	58.8	46.0	51.0	49.5	57.6	36.7	-20.9**	-36
Lottery	60.9	61.2	63.2	65.0	57.1	64.0	56.5	-7.5	-12
Casino	NA	NA	64.4	57.0	57.1	53.2	54.0	0.8	2
Online	NA	NA	NA	NA	NA	20.9	14.9	-6.0	-29
Any Game	90.4	87.1	86.2	86.0	87.6	89.2	81.4	-7.8	-9

9 th Grade Girls									
Cards	43.5	47.3	36.7	33.3	33.4	26.6	19.3	-7.3*	-27
Skill games	31.5	24.1	23.0	26.1	24.4	25.0	21.3	-3.7	-15
Sports teams	30.2	22.7	20.9	17.5	24.1	17.2	16.5	-0.7	-4
Lottery	37.1	39.9	15.8	15.0	13.4	17.2	16.1	-1.1	-6
Casino	NA	NA	6.1	5.1	3.3	4.2	5.1	0.9	21
Online	NA	NA	NA	NA	NA	4.5	3.9	-0.6	-13
Any Game	64.9	64.5	50.5	49.6	46.8	44.5	39.8	-4.7	-11
12th Grade Girls									
Cards	35.5	41.9	28.2	36.5	26.1	29.8	21.9	-7.9	-27
Skill games	12.7	16.3	10.6	20.3	17.4	28.1	21.9	-6.2	-22
Sports teams	20.9	18.6	11.8	16.2	14.1	22.3	16.8	-5.5	-25
Lottery	49.1	52.3	43.5	37.8	25.0	38.0	34.3	-3.7	-10
Casino	NA	NA	40.0	40.5	35.9	34.7	29.9	-4.8	-14
Online	NA	NA	NA	NA	NA	5.8	3.6	-2.2	-38
Any Game	62.7	67.4	61.2	60.8	55.4	60.3	59.1	-1.2	-2

Note. NA denotes Not Available. Any game refers to highest rate of gambling across all five gambling items. Bold and asterisks denote statistical significance of the difference between two independent proportions (z-ratio, two-tailed): * $p < .05$, ** $p < .01$.

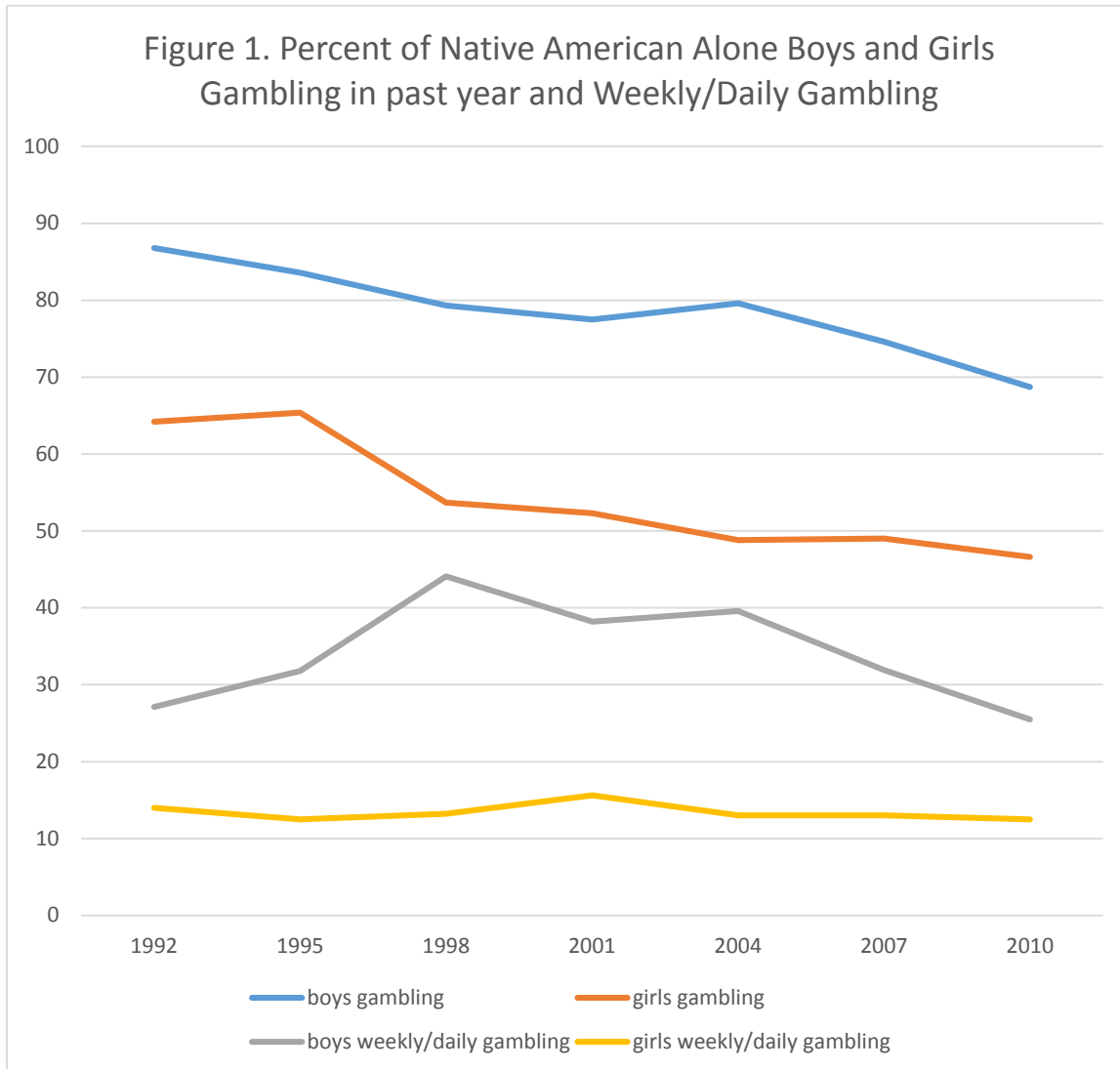
Table 8

Weekly/Daily Gambling in last 12 months for Native American Alone Students, by Gender, and for each Game for each Year from 1992 to 2010

Game	1992 N=725 %	1995 N=600 %	1998 N=605 %	2001 N=664 %	2004 N=798 %	2007 N=893 %	2010 N=873 %	Difference 2007 to 2010	% Change 2007 to 2010
Any game All Students	20.6	22.5	29.8	27.7	26.6	22.8	19.7	-3.1	-14
Any game Boys	27.1	31.8	44.1	38.2	39.6	31.9	25.5	-6.4*	-20
Any game Girls	14.0	12.5	13.2	15.6	13.0	13.0	12.5	-0.5	-4
9th Grade Boys									
Cards	11.5	22.1	33.8	20.3	27.2	18.8	11.8	-6.9*	-37
Skill games	11.5	15.5	24.9	22.3	21.5	17.8	13.7	-4.1	-23
Sports teams	14.3	15.9	28.3	19.9	17.2	13.2	12.1	-1.1	-8
Lottery	7.1	13.3	12.2	10.5	8.9	9.8	6.5	-3.3	-34
Casino	NA	NA	5.9	5.5	4.3	7.1	5.9	-1.2	-17
Online	NA	NA	NA	NA	NA	5.2	6.2	1.0	19
Any Game	24.6	30.5	45.1	35.2	37.7	28.3	21.5	-6.8*	-24
12th Grade Boys									
Cards	20.0	28.2	11.5	27.0	31.4	25.2	16.2	-9.0	-36
Skill games	16.5	17.6	16.1	22.0	27.6	25.9	14.9	-11.0*	-42
Sports teams	11.3	14.1	17.2	23.0	21.0	20.9	12.4	-8.4*	-40
Lottery	16.5	18.8	24.1	23.0	23.8	23.0	18.6	-4.4	-19
Casino	NA	NA	17.2	25.0	19.0	18.7	18.0	-0.7	-4
Online	NA	NA	NA	NA	NA	5.0	7.4	2.4	48
Any Game	32.2	35.3	41.4	46.0	44.8	40.3	33.5	-6.8	-17

9 th Grade Girls									
Cards	4.4	6.9	9.2	8.1	6.0	6.2	6.7	0.5	8
Skill games	4.4	2.5	6.6	5.1	4.3	4.5	3.5	-1.0	-22
Sports teams	4.4	2.5	5.6	4.3	3.7	4.5	5.5	1.0	-22
Lottery	5.2	3.9	5.6	4.3	3.7	3.6	3.2	-0.4	-11
Casino	NA	NA	1.5	2.6	0.7	1.0	2.8	1.8**	180
Online	NA	NA	NA	NA	NA	2.3	2.4	0.1	4
Any Game	14.5	11.3	12.8	14.5	11.7	12.0	11.0	-1.0	-8
12th Grade Girls									
Cards	5.5	8.1	5.9	6.8	4.3	7.4	3.6	-3.8	-51
Skill games	3.6	2.3	3.5	1.4	2.2	5.8	3.6	-2.1	-36
Sports teams	2.7	3.5	2.4	2.7	1.1	5.0	4.4	-0.6	-12
Lottery	6.4	9.3	11.8	9.5	7.6	10.7	10.9	0.2	2
Casino	NA	NA	2.4	9.5	10.9	8.3	6.6	-1.7	-20
Online	NA	NA	NA	NA	NA	4.1	2.2	-1.9	-46
Any Game	12.7	15.1	14.1	18.9	17.4	15.7	15.3	-0.4	-3

Note. NA denotes Not Available. Any game refers to highest rate of gambling across all five gambling items. Bold and asterisks denote statistical significance of the difference between two independent proportions (z-ratio, two-tailed): *p < .05, **p < .01.



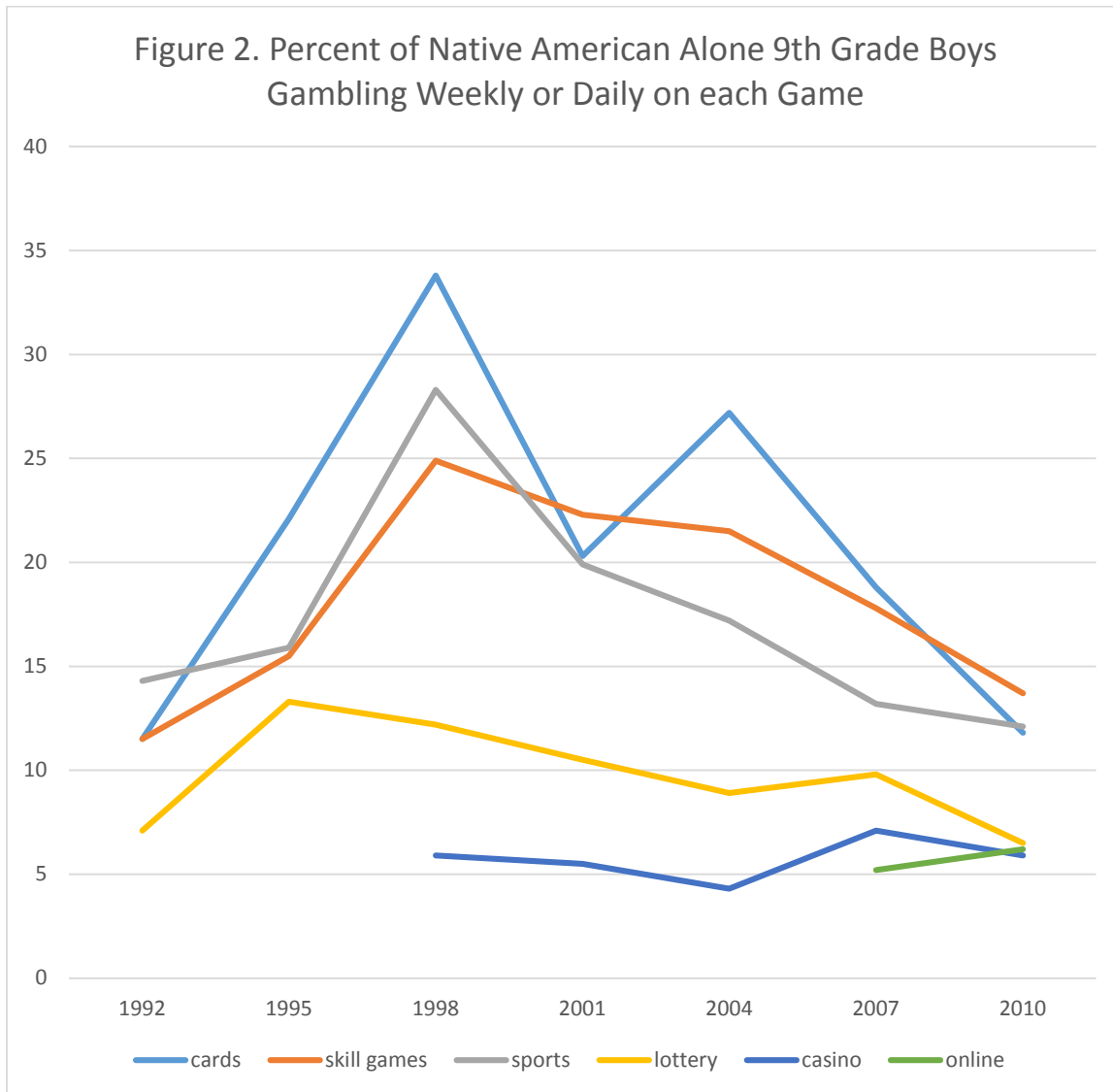
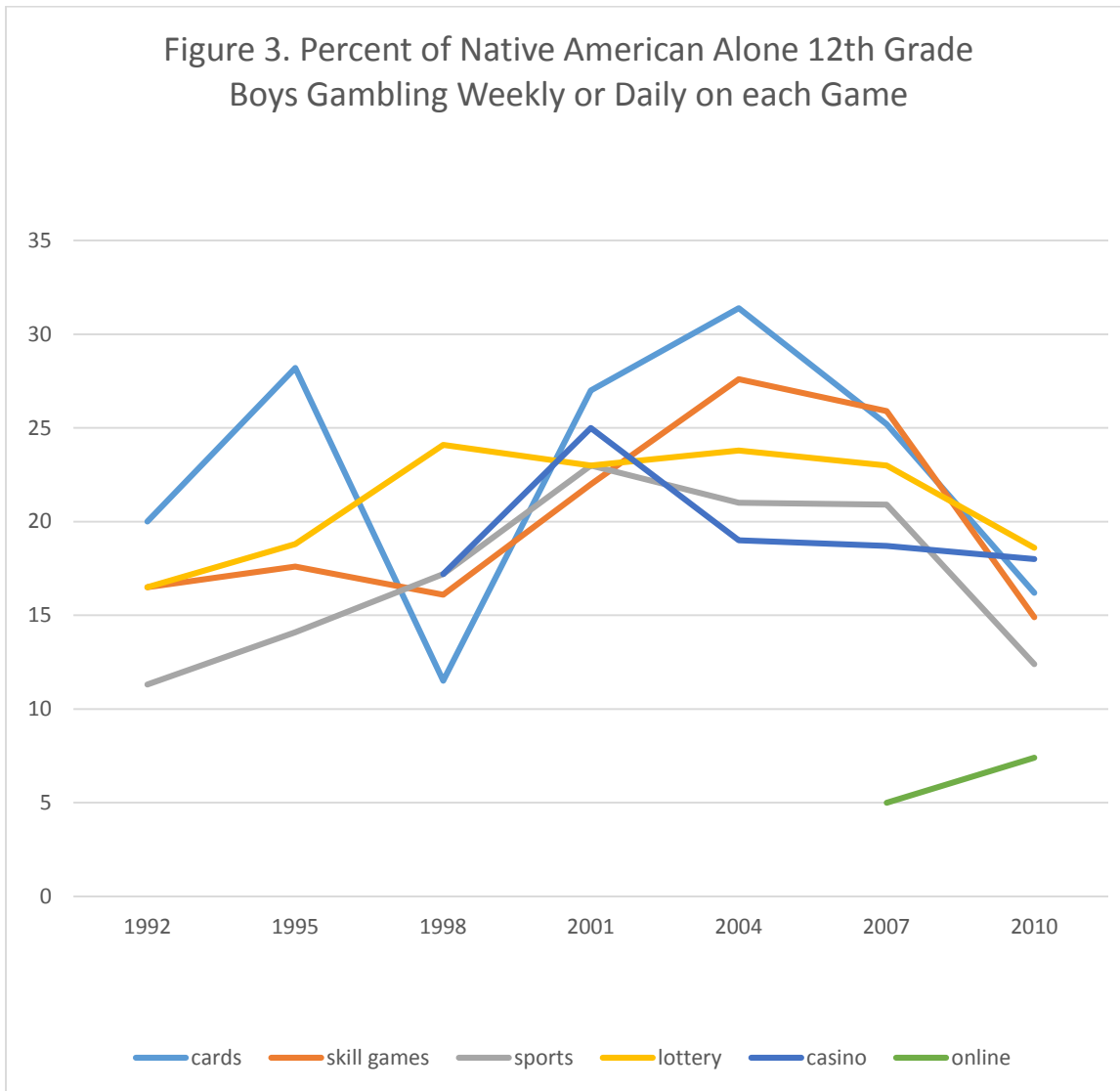


Figure 3. Percent of Native American Alone 12th Grade Boys Gambling Weekly or Daily on each Game



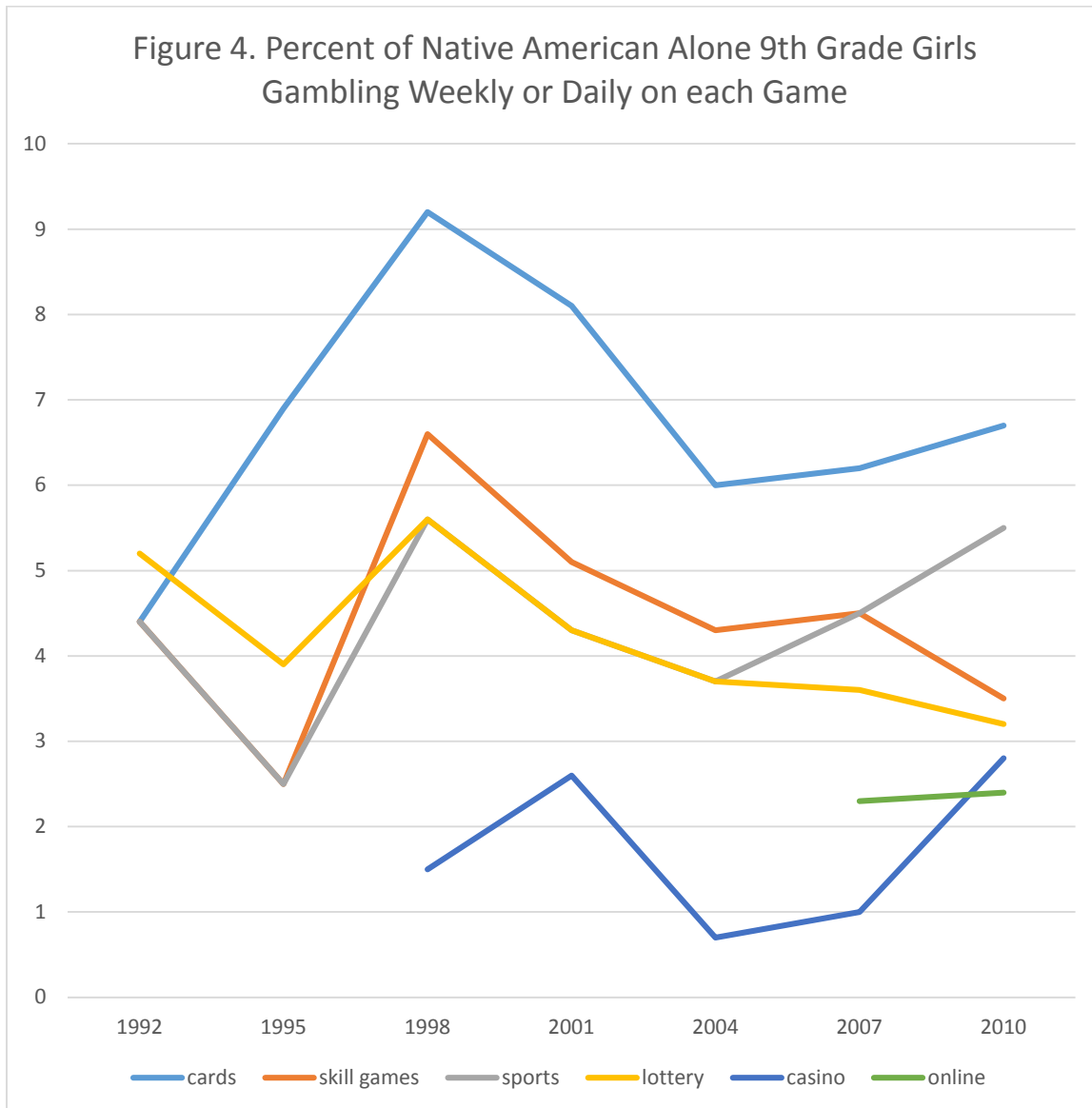
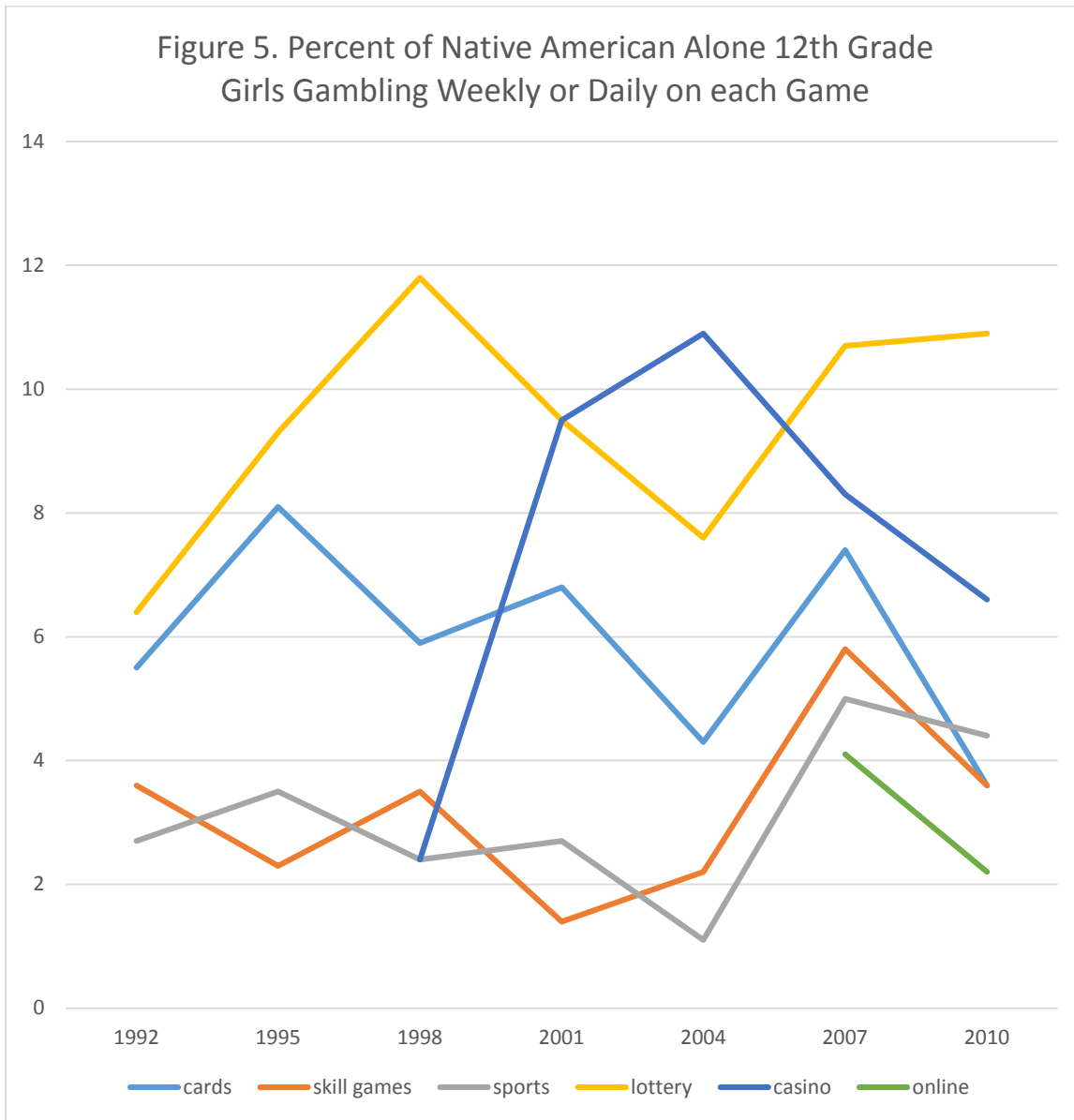


Figure 5. Percent of Native American Alone 12th Grade Girls Gambling Weekly or Daily on each Game

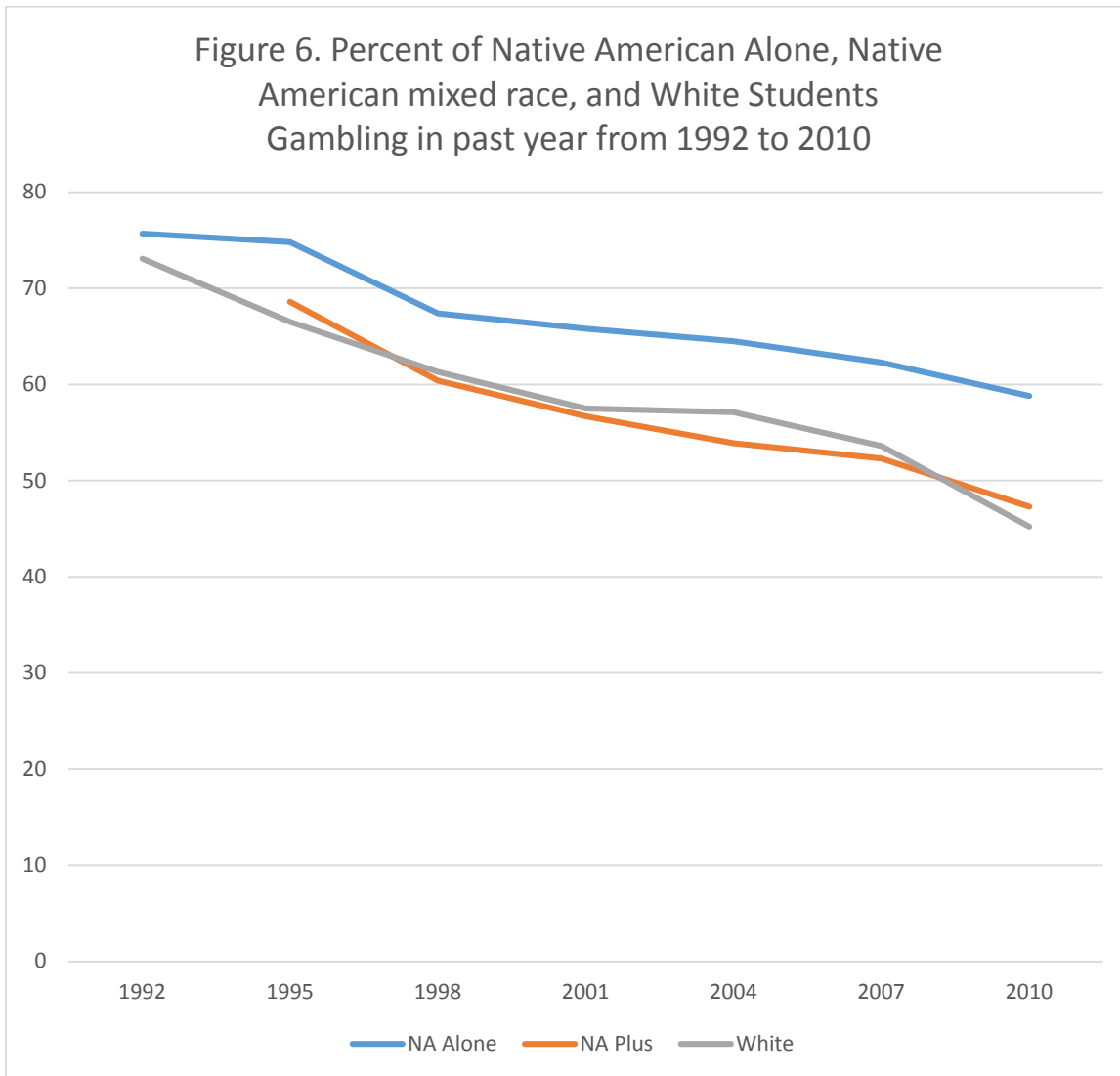


A comparison of the three groups, Native American Alone, Native American Mixed race, and White students on any gambling from 1992 to 2010 is shown in Table 9 and Figure 6. All rates of any gambling from 1992 to 2010 showed large declines. The comparisons from 2007 to 2010 for Native American Alone students showed declines but only boys showed a statistically significant decline, whereas, all declines from 2007 to 2010 for Native American Mixed race and White students were statistically significant. Figure 6 illustrates that Native American Alone students have slightly higher rates of gambling than Native American Mixed race and White students but all three groups have nearly identical slightly downward trajectories of gambling from 1992 to 2010.

Table 9									
Native American (NA) Alone, Native American (NA) mixed race, and White students on any gambling in past year from 1992 to 2010									
Group	1992 %	1995 %	1998 %	2001 %	2004 %	2007 %	2010 %	Difference 2007 to 2010	% Change 2007 to 2010
NA Alone	75.7	74.8	67.4	65.8	64.5	62.3	58.8	-3.5	-6
NA Mixed	NA	68.6	60.4	56.7	53.9	52.3	47.3	-5.1**	-10
White	73.1	66.5	61.3	57.5	57.1	53.6	45.2	-8.4**	-16
Boys									
NA Alone	86.8	83.6	79.3	77.5	79.6	74.6	68.7	-5.9*	-8
NA Mixed	NA	80.4	74.2	73.5	70.5	67.9	62.0	-5.9**	-9
White	84.8	79.9	76.1	72.7	72.9	69.6	59.4	-10.2**	-15
Girls									
NA Alone	64.2	65.4	53.7	52.3	48.8	49.0	46.6	-2.4	-5
NA Mixed	NA	59.2	49.2	44.5	42.6	39.5	35.5	-4.0*	-10
White	61.8	53.6	47.1	43.0	42.6	38.5	31.9	-6.6**	-17

Note. NA indicates Not Available. Bold and asterisks denote statistical significance of the difference between two independent proportions (z-ratio, two-tailed): * p < .05, ** p < .01.

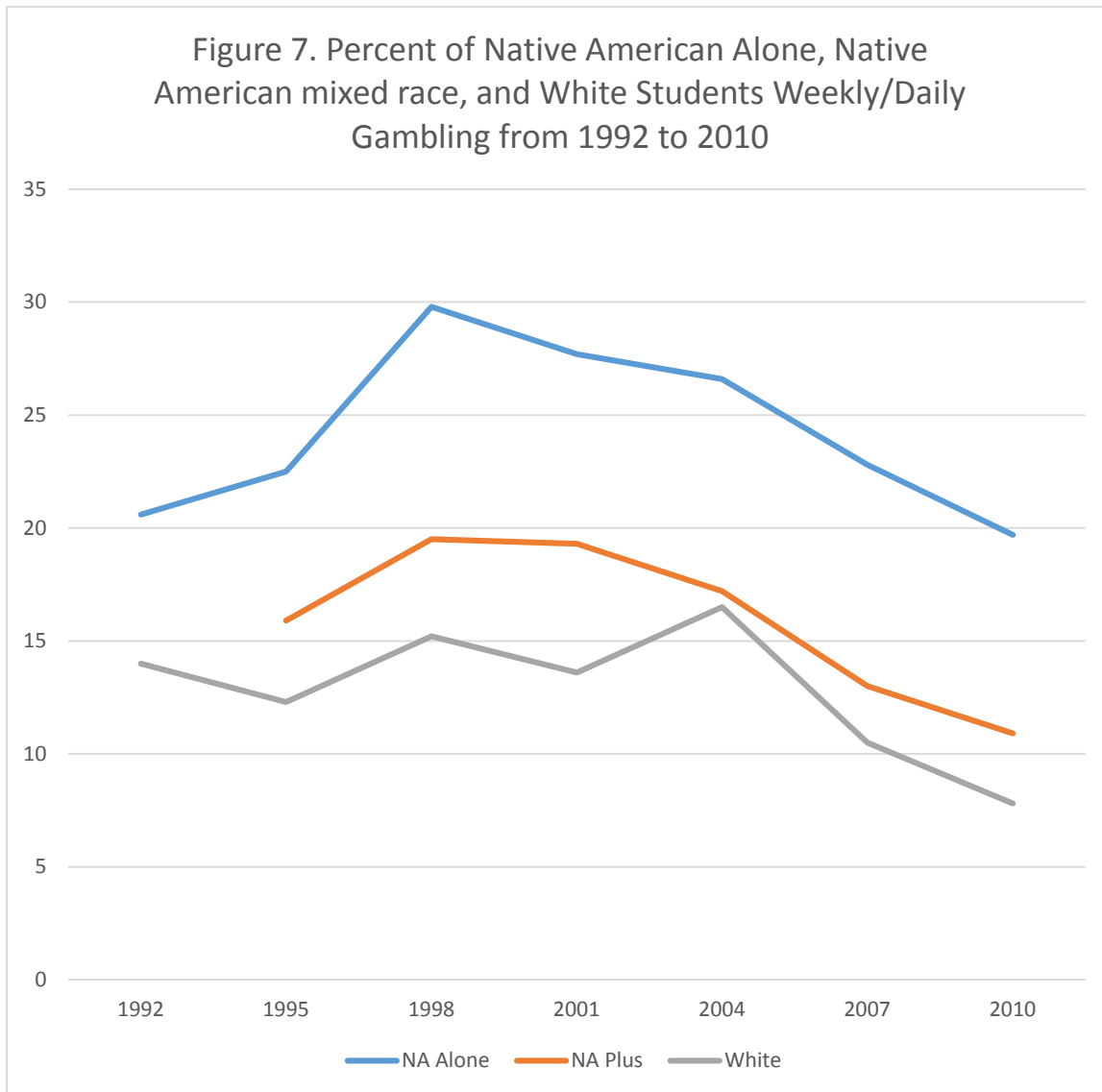
Figure 6. Percent of Native American Alone, Native American mixed race, and White Students Gambling in past year from 1992 to 2010



A comparison of the three groups, Native American alone, Native American Mixed race, and White students on frequent gambling from 1992 to 2010 is shown in Table 10 and Figure 7. Rates of frequent gambling from 1992 to 2010 showed fluctuations but were relatively stable for Native American Alone students, whereas Native American Mixed race and White Students showed modest declines from 1992 to 2010. The comparisons from 2007 to 2010 for Native American Alone students showed declines but only boys showed a statistically significant decline, whereas, Native American Mixed race students as a whole and boys showed statistically significant declines and White students as a whole and for boys and girls showed statistically significant declines. Figure 7 illustrates that Native American Alone students have higher rates of frequent gambling than Native American Mixed race and White students, and Native American Mixed race students have higher rates than White Students but all three groups have nearly identical slightly downward trajectories of gambling from 2004 to 2010.

Table 10									
Native American (NA) Alone, Native American (NA) mixed race, and White students on weekly/daily gambling from 1992 to 2010									
Group	1992 %	1995 %	1998 %	2001 %	2004 %	2007 %	2010 %	Difference 2007 to 2010	% Change 2007 to 2010
NA Alone	20.6	22.5	29.8	27.7	26.6	22.8	19.7	-3.1	-14
NA Mixed	NA	15.9	19.5	19.3	17.2	13.0	10.9	-2.1*	-16
White	14.0	12.3	15.2	13.6	16.5	10.5	7.8	-2.7**	-26
Boys									
NA Alone	27.1	31.8	44.1	38.2	39.6	31.9	25.5	-6.4*	-20
NA Mixed	NA	25.0	32.1	30.2	30.6	21.1	17.6	-3.5*	-17
White	22.3	20.6	25.0	23.1	28.5	18.1	13.2	-4.9**	-27
Girls									
NA Alone	14.0	12.5	13.2	15.6	13.0	13.1	12.5	-0.5	-4
NA Mixed	NA	8.6	9.4	11.4	8.0	6.2	5.5	-0.7	-11
White	5.9	4.3	5.7	4.6	5.5	3.3	2.8	-0.5**	-15

Note. NA indicates Not Available. Bold and asterisks denote statistical significance of the difference between two independent proportions (z-ratio, two-tailed): *p < .05, **p < .01.

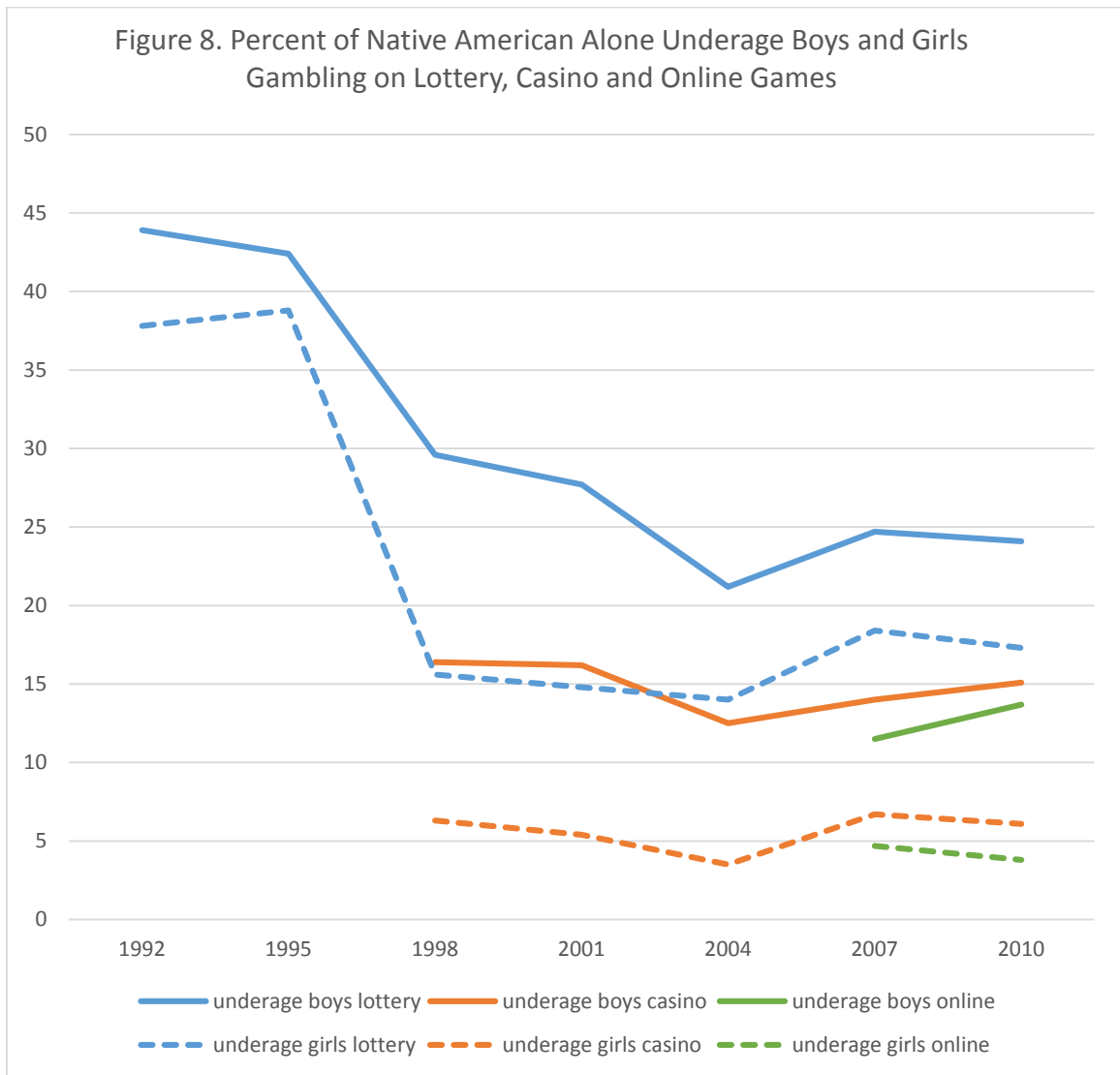


Underage lottery, casino, and online gambling rates for Native American Alone and broken down by gender from 1992 to 2010 are shown in Table 11 and Figure 8. There was a relatively high rate of underage lottery play in 1992 for Native American Alone students (40.8%) and for boys (43.9%) and girls (37.8%), however, there has been a consistent and gradual decline from 1992 to 2010 where the 2010 rate was 20.9% for Native American Alone students and 24.1% for boys and 17.3% for girls. A question about casino gambling was added to the MSS in 1998 and underage casino gambling has been fairly stable between 1998 (11.6%) and 2010 (10.9%). Underage boy's and girl's casino gambling has been relatively stable from 1998 to 2010. A question about online gambling was added to the MSS in 2007 and there was an increase from 2007 (8.1%) to 2010 (9.1%), however, it was not statistically significant. Underage online gambling showed an increase for boys and a decrease for girls from 2007 to 2010, however, neither was statistically significant. None of the comparisons from 2007 to 2010 were statistically significant. In general, underage gambling by Native American Alone students has been fairly stable from 2007 to 2010. Figure 8 shows that underage gambling by Native American Alone students showed significant declines in lottery play from 1992 to 2010 and that rates of casino and online gambling have been relatively stable since they were added to the MSS.

Table 11									
Underage Gambling by Native American Alone Students by Game and by Gender from 1992 to 2010									
Game	1992 %	1995 %	1998 %	2001 %	2004 %	2007 %	2010 %	Difference 2007 to 2010	% Change 2007 to 2010
Lottery	40.8	40.7	23.0	21.5	17.5	21.5	20.9	-0.6	-3
Casino	NA	NA	11.6	11.0	8.0	10.4	10.9	0.5	5
Online	NA	NA	NA	NA	NA	8.1	9.1	1.0	12
Any	NA	NA	25.9	25.0	19.9	25.4	25.6	0.2	1
Boys									
Lottery	43.9	42.4	29.6	27.7	21.2	24.7	24.1	-0.6	-2
Casino	NA	NA	16.4	16.2	12.5	14.0	15.1	1.1	8
Online	NA	NA	NA	NA	NA	11.5	13.7	2.2	19
Any	NA	NA	33.2	31.7	24.8	29.1	30.3	1.2	4
Girls									
Lottery	37.8	38.8	15.6	14.8	14.0	18.4	17.3	-1.1	-6
Casino	NA	NA	6.3	5.4	3.5	6.7	6.1	-0.6	-9
Online	NA	NA	NA	NA	NA	4.7	3.8	-0.9	-19
Any	NA	NA	17.9	17.9	15.2	21.7	20.2	-1.5	-7

Note. Underage is defined as less than 18 years of age. NA denotes Not Available. Bold and asterisks denote statistical significance of the difference between two independent proportions (z-ratio, two-tailed): * p < .05, ** p < .01.

Figure 8. Percent of Native American Alone Underage Boys and Girls Gambling on Lottery, Casino and Online Games

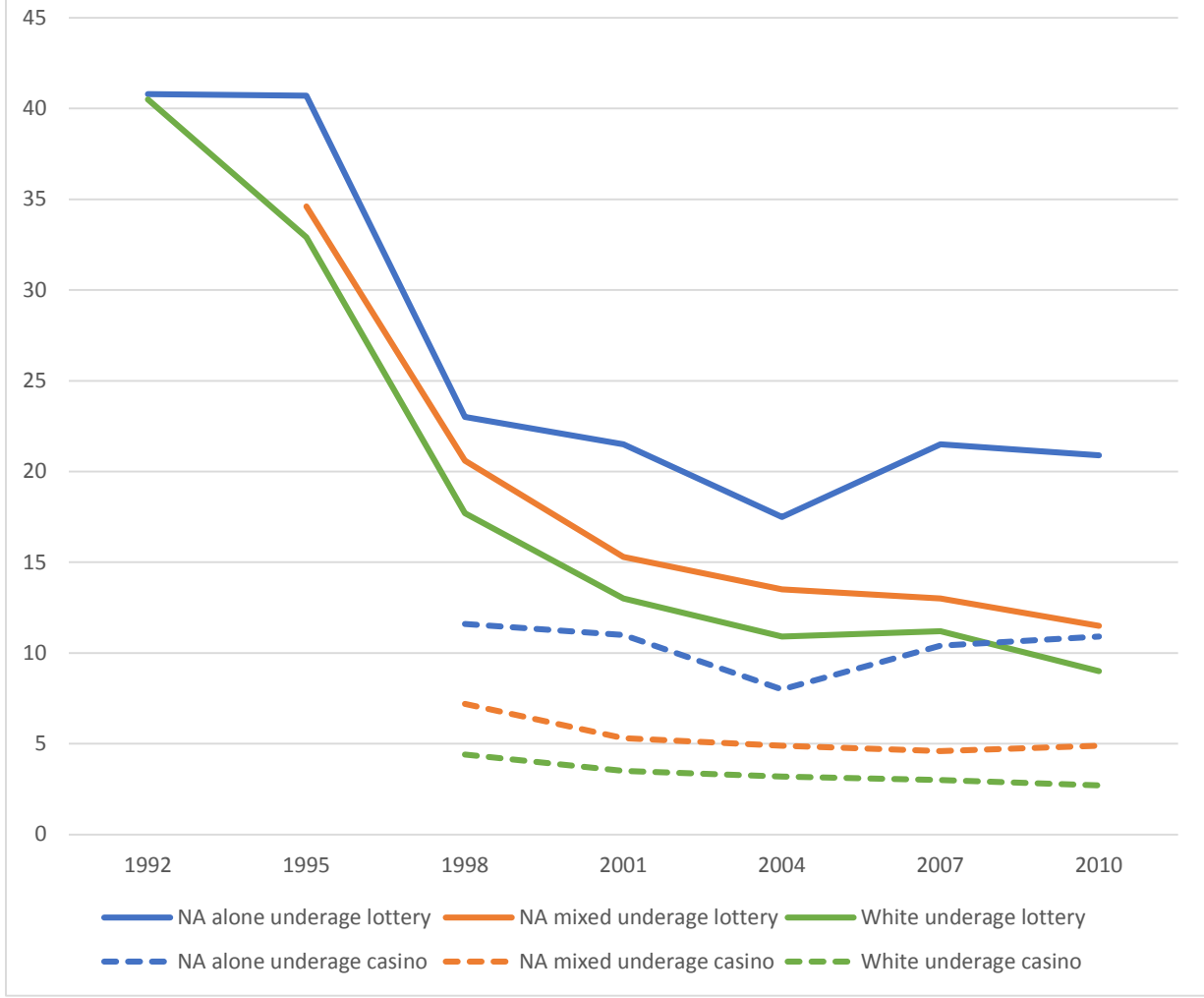


Underage lottery, casino, and online gambling rates for Native American Alone, Native American mixed race and White students from 1992 to 2010 are shown in Table 12 and Figure 9. There were relatively high rates of underage lottery play in 1992 and 1995 for all three groups, although Native American Alone students had higher rates than Native American mixed students who had higher rates than White students. All three groups showed declines in underage lottery play from 1992 and 1995 to 2004. While Native American mixed and White students continued to decline in underage lottery play in 2007 and 2010, Native American alone students showed an increase in 2007 and 2010. Rates of underage casino gambling were relatively stable from 1998 to 2010, except for Native American alone students who showed an increase from 2004 to 2010. Native American alone students had higher rates of underage casino gambling than Native American mixed students who had higher rates than White students. There are only two assessments of online gambling and these showed an increase in Native American alone underage online gambling from 2007 (8.1%) to 2010 (9.1%), while both Native American mixed and White students showed declines. None of the comparisons from 2007 to 2010 were statistically significant for Native American alone and Native American mixed students, whereas all of the comparisons were statistically significant declines for White students. In general, Native American alone showed more underage gambling than Native American mixed, who showed more than White students, and all three groups showed similar trends over time with the exception that Native American alone students showed an increase in lottery and casino play in 2007 and 2010.

Table 12									
Percent of Native American Alone, Native American Mixed, and White Students Underage Gambling 1992 to 2010									
Game	1992 %	1995 %	1998 %	2001 %	2004 %	2007 %	2010 %	Difference 2007 to 2010	% Change 2007 to 2010
Native American Alone									
Lottery	40.8	40.7	23.0	21.5	17.5	21.5	20.9	-0.6	-3
Casino	NA	NA	11.6	11.0	8.0	10.4	10.9	0.5	5
Online	NA	NA	NA	NA	NA	8.1	9.1	1.0	12
Any	NA	NA	25.9	25.0	19.9	25.4	25.6	0.2	1
Native American Mixed									
Lottery	NA	34.6	20.6	15.3	13.5	13.0	11.5	-1.5	-12
Casino	NA	NA	7.2	5.3	4.9	4.6	4.8	0.2	4
Online	NA	NA	NA	NA	NA	4.7	3.8	-0.9	-19
Any	NA	NA	22.1	16.7	14.6	15.7	13.8	-1.9	-12
White									
Lottery	40.5	32.9	17.7	13.0	10.9	11.2	9.0	-2.2**	-20
Casino	NA	NA	4.4	3.5	3.2	3.0	2.7	-0.3**	-10
Online	NA	NA	NA	NA	NA	3.3	2.5	-0.8**	-24
Any	NA	NA	18.9	14.0	11.8	12.8	10.4	-2.4**	-19

Note. Underage is defined as less than 18 years of age. NA denotes Not Available. Bold and asterisks denote statistical significance of the difference between two independent proportions (z-ratio, two-tailed): *p < .05, **p < .01.

Figure 9. Percent of Native American Alone, Native American Mixed Race, and White Students Underage Lottery and Casino Gambling 1992 to 2010



Correlates of Gambling

The third specific aim is to identify correlates of gambling. Table 13 shows stepwise multiple regressions for the Native American Alone sample and for boys and girls. For the Native American Alone sample, six correlates were identified that accounted for 29% of the variance in gambling frequency, and these include, in order of magnitude, smoking cigars; hitting or beating up another person; being male; believing that your parents'/guardians' would not care if they knew you drank alcohol; having five or more drinks in a row; and being forced to have sex or do something sexual with someone you were dating. For boys, the multiple regression yielded five correlates that accounted for 35% of the variance in gambling frequency including, in order of magnitude, smoking cigars; having five or more drinks in a row; forced to have sex or do something sexual when you did not want to with someone you were dating; skipping or cutting school; and believing that your parents'/guardians' would not care if they knew you drank alcohol. For girls, the multiple regression yielded four correlates that accounted for 28% of the variance in their gambling frequency and they include, in order of magnitude, running away from home; smoking cigars; participating in mentoring programs (as a mentor or being mentored); and hitting or beating up another person.

Table 13				
Multiple Stepwise Regression Between Gambling Frequency and Related Variables for Native American Alone Students and by Gender in 2010				
Regression Step	MSS Correlate	<i>Beta</i>	<i>r</i>	<i>r</i> ²
Native American Alone sample				
1	During the last 30 days, on how many days did you smoke cigars, cigarillos or little cigars?	.25	.41	.17
2	During the last 12 months, how often have you hit or beat up another person?	.21	.49	.23
3	Being Male	.17	.51	.26
4	Over the last two weeks, how many times (if any) have you had five or more drinks in a row?	.11	.52	.27
5	Has someone you were going out with ever forced you to have sex or do something sexual when you did not want to?	.11	.53	.28
6	How do you think your parents or guardians would feel if you drank alcohol?	-.09	.54	.29
Boys				
1	During the last 30 days, on how many days did you smoke cigars, cigarillos or little cigars?	.26	.47	.22
2	Over the last two weeks, how many times (if any) have you had five or more drinks in a row?	.21	.54	.29
3	Has someone you were going out with ever forced you to have sex or do something sexual when you did not want to?	.17	.57	.33
4	During the last 30 days, how often have you skipped or cut full days of school?	.17	.58	.34
5	How do you think your parents or guardians would feel if you drank alcohol?	-.12	.59	.35
Girls				
1	During the last 12 months, how often have you run away from home?	.30	.37	.14
2	During the last 30 days, on how many days did you smoke cigars, cigarillos or little cigars?	.25	.46	.22
3	During the last 12 months, how often have you participated in mentoring programs (as a mentor or being mentored)?	.24	.52	.27
4	During the last 12 months, how often have you hit or beat up another person?	.10	.53	.28

Problem Gambling

The fourth specific aim is to compare the three groups on endorsement of two problem gambling items and compare rates of endorsement of these two items over time, from 1992 to 2004. These two problem gambling items were last administered on the MSS in 2004. A comparison of the three groups on endorsement rates for the two problem gambling items are show in Table 14 and broken down by gender. Two additional variables were computed: (a) endorsing either item; and (b) endorsing both items. Table 14 shows that the Native American Alone students had higher rates of endorsing the problem gambling items than both Native American Mixed race and White students and these differences were statistically significant both items and for endorsing either item, but not for endorsing both items. The Native American Mixed race and White students were not significantly different from each other on problem gambling item endorsement. Boys were more similar than different between the three groups. Native American Alone girls had higher endorsement rates than Native American Mixed race and White girls for both items and for endorsing either item and these were statistically significant but not for endorsing both items. Table 15 shows endorsement rates of problem gambling items by Native American Alone Students and by Gender from 1992 to 2004. In general, endorsement rates of problem gambling items were stable from 1992 to 2004 and all rates from 2001 to 2004 showed modest declines and boys showed statistically significant declines for the “felt bad” item and for endorsing either item.

Table 14

Comparison of Native American (NA) Alone, Native American (NA) mixed race, and White Students on Problem Gambling Items and by Gender in 2004

Problem Gambling Item	NA Alone %	NA Mixed %	White %	NA Alone vs. NA Mixed X^2 (p)	NA Alone vs. White X^2 (p)	NA Mixed vs. White X^2 (p)
Felt bad about amount you bet	9.3	6.2	7.0	28 (<.001)	26 (<.001)	3 (.18)
Would like to stop	6.0	3.5	2.7	28 (<.001)	48 (<.001)	9 (.01)
Endorsed either item	12.8	8.3	8.2	13 (<.001)	22 (<.001)	0 (.85)
Endorsed both items	2.3	1.2	1.3	4 (.03)	5 (.03)	0 (.49)
Boys						
Felt bad about amount you bet	10.8	9.9	10.9	9 (.01)	7 (.04)	3 (.28)
Would like to stop	8.4	6.1	4.6	9 (.01)	16 (<.001)	7 (.03)
Endorsed either item	15.2	13.7	12.9	1 (.47)	2 (.16)	0 (.52)
Endorsed both items	3.4	2.0	2.4	2 (.15)	2 (.17)	0 (.53)
Girls						
Felt bad about amount you bet	7.8	3.6	3.4	13 (.001)	31 (<.001)	4 (.15)
Would like to stop	3.6	1.7	0.9	9 (.01)	39 (<.001)	8 (.02)
Endorsed either item	10.2	4.7	3.9	15 (<.001)	41 (<.001)	2 (.21)
Endorsed both items	1.0	0.6	0.4	1 (.34)	4 (.05)	1 (.38)

Note. Bold indicates statistical significance of alpha < .01.

Table 15							
Problem Gambling by Native American Alone Students and by Gender from 1992 to 2004							
Problem Gambling Items	1992 %	1995 %	1998 %	2001 %	2004 %	Difference 2001 to 2004	% Change 2001 to 2004
Felt bad about amount you bet	9.5	10.5	11.7	11.9	9.1	-2.8	-24
Would like to stop	5.5	6.5	6.8	7.7	5.9	-1.8	-23
Either item	12.3	14.0	15.0	15.8	12.8	-3.0	-19
Both items	2.8	3.0	3.5	3.8	2.3	-1.5	-39
Boys							
Felt bad about amount you bet	12.0	16.1	17.0	16.6	10.6	-6.0*	-36
Would like to stop	6.8	10.0	10.2	10.7	8.1	-2.6	-24
Either item	15.0	20.6	21.6	22.2	15.2	-7.0*	-32
Both items	3.8	5.5	5.6	5.1	3.4	-1.6	-31
Girls							
Felt bad about amount you bet	7.0	4.5	5.7	6.5	7.7	-1.2	-18
Would like to stop	4.2	2.8	2.8	4.2	3.6	-0.6	-14
Either item	9.5	6.9	7.5	8.4	10.2	-1.8	-21
Both items	1.7	0.3	1.1	2.3	1.0	-1.3	-57

Note. Bold and asterisks denote statistical significance of the difference between two independent proportions (z-ratio, two-tailed): *p < .05, **p < .01.

Discussion

This study had four specific aims. First, compare the three groups, Native American alone, Native American mixed race, and White students on 2010 rates of gambling frequency on six different forms of gambling as well as any gambling, weekly/daily gambling, and underage gambling on legalized forms of gambling. Second, compare gambling trends over time, from 1992 to 2010, specifically comparing rates of any gambling, weekly/daily gambling, and

underage gambling. Third, identify correlates of gambling among Native American alone students. Fourth, compare the three groups on endorsement of two problem gambling items and compare rates of endorsement of these two items over time, from 1992 to 2004.

Comparison of Native American Alone, Native American mixed race, and White Students on 2010 rates of gambling

This specific aim addresses the question of whether Native American students are more involved in gambling than White students. More Native American Alone students are involved in gambling than either Native American Mixed race or White students; and more Native American Mixed Race students are involved in gambling than White students. This order, Native American Alone, Native American Mixed Race, and White students was evident in nearly all comparisons of any gambling, frequent gambling, underage gambling and gambling on specific games. More than half (58.8%) of Native American Alone students gambled in the past year as compared to less than half of Native American Mixed Race (47.3%) and White Students (45.2%). There were a few exceptions to this finding and the exceptions included that White Students had slightly higher rates of lottery and casino gambling than Native American Mixed Race students, however, these differences were not statistically significant. There are larger differences between the three groups for frequent gambling (i.e., weekly or daily). There were twice as many Native American Alone students (19.7%) gambling frequently than either Native American Mixed Race (10.9%) or White (7.8%) students. This pattern was more pronounced for girls, where there were four times as many Native American Alone girls gambling frequently (12.5%) than White girls (2.8%). The exceptions again, were lottery and casino gambling where Native American Mixed Race and White students had similar rates. There were also large differences between the three groups on underage gambling, where twice as many Native

American Alone students played lottery games as compared to Native American Mixed Race and White students and three to four times as many Native American Alone students reported frequent casino and online gambling as compared to White students. Native American Mixed race students also exhibited less involvement in gambling than Native American Alone students and greater involvement in gambling than White students. This pattern held for boys and girls as well. The categories of frequent gambling and underage gambling are considered of greater concern than “any gambling” because it shows a level of gambling involvement that can expose the student to greater risk of negative consequences such as significant loss of money and excessive time spent gambling when the student should be attending to other activities such as family, friends, school, community, cultural events, etc. This study does not answer the question of why the Native American alone students are more involved in gambling than the mixed race Native American students and this will require additional research to answer.

This finding that Native American students are more involved in gambling than White students corroborates findings reported by other investigators, including Zitzow (1996) who found that Minnesota Native American students gambled more frequently than their non-Native American peers. Stinchfield, Cassuto, Winters and Latimer (1997) reported that Minnesota Native American students had higher rates of frequent gambling than White students. Peacock, Day and Peacock (1999) found that Minnesota Native American youth had higher rates of gambling than their non-Native American peers. These earlier studies showed preliminary evidence that Native American students were more involved in gambling than their non-Native American peers and this current study provides further evidence of this conclusion. It is fairly well established now that Native American youth are more involved in gambling than their non-Native American peers. This study does not answer the question of why Native American

students are more involved in gambling than White students, but it is likely due to a number of reasons mentioned in the aforementioned studies, including greater exposure to gambling on tribal reservations, low socioeconomic status, cultural acceptance of beliefs about luck and fate, minority status, and the fact that gambling has historically played a significant role in tribal life (see Peacock, Day & Peacock, 1999). Gambling has played an important role in the history and culture of Native American people and may play a larger role now with the growth of tribal gambling and tribal casinos. There are 18 tribal casinos in Minnesota and they play a central role in tribal community life for tribal members who benefit from the economic development afforded their community by tribal gambling. The presence of tribal casinos has also likely made casino gambling more accessible to Native American teenagers who live on reservations that have casinos, particularly those of legal age, as compared to non-Native American youth who may live further away from a tribal casino. While it is illegal for underage youth to gamble in a casino, tribal casinos play a role in social gatherings on tribal reservations and thus Native American youth may have access to casinos that their non-Native American peers do not have. There is also the possibility that Native American youth are reflecting the higher rates of addiction among Native American adult populations having its roots in multiple biological, psychological, and social causes.

Gambling Trends from 1992 to 2010

Rates of any gambling showed fairly consistent and significant declines from 1992 to 2010 across nearly all games. There were fewer Native American students gambling in 2010 (58.8%) than in 1992 (75.7%) and this was true for boys and girls. All three groups show this downward slope in Figure 6 and the Native American Mixed Race and White Students had nearly identical rates of decline. This study does not address the question of why there are fewer

Native American youth gambling now than in the past, but one only needs to look at how teenagers spend their spare time for answers to this question. Gambling competes against other options for teenagers' attention namely the use of the internet and social media via smart phones and tablets. Youth spend much of their spare time on smart phones and tablets listening to music, watching videos, playing games, interacting on social networks, such as Facebook, Instagram, Snapchat, and photo sharing, etc. (Stinchfield, 2011).

For frequent gambling trends over time there are four important findings. First, rates of frequent gambling showed some fluctuations over time, but were relatively stable when comparing 1992 to 2010. The proportion of Native American students gambling frequently remained stable from 1992 (20.6%) to 2010 (19.9%). In spite of the decline in proportion of Native American students gambling, the proportion of those who gamble frequently stayed about the same from 1992 to 2010, which shows that there is a segment of the Native American youth population who are frequent gamblers and this proportion remains fairly consistent over time. Second, the 2010 survey showed declines from 2007 in frequent play of many games and boys showed statistically significant declines in any game, cards, skill games, and sports betting. Third, there were few instances of increases from 2007 to 2010, however one increase in 9th grade girls casino gambling was statistically significant 2007 to 2010, moving from 1% to 2.8%. While this is a small percentage, it is of concern, since it is illegal for 9th grade girls to gamble in a casino. While the popularity of gambling appears to be waning among most Native American students, there is a small proportion of frequent gamblers that continues at about the same level from 1992 to 2010. It would be important to understand what maintains this consistent level of frequent gambling among this small segment of the Native American youth population. Four, it appears that some games experienced peaks of interest and frequent play that now has waned in

2010.

When comparing the three groups on trends in any gambling from 1992 to 2010, all three groups show significant declines and the Native American Mixed Race group rates are identical and overlap that of White students and all three groups have nearly identical downward slopes. In comparing the three groups on trends in frequent gambling from 1992 to 2010, all three groups show different rates of frequent gambling but the trajectory is similar showing peaks in the late 1990s and early 2000s and consistent and significant declines for all three groups from 2004 to 2010.

For trends in underage gambling among Native American Alone boys and girls, there was a large decrease from 1995 to 1998 in underage lottery play and fairly stable rates from 1998 to 2010. The decrease in lottery play is good news for those wanting to prevent underage lottery play. This study does not determine why there is a decrease in underage lottery play, however it is known that this decline was also observed in the larger underage MN student population (Stinchfield, 2011) and is not unique to the Native American student population. It has been speculated that one possible reason for the decline is that the novelty of lottery play has gradually worn off after its introduction in 1990 in Minnesota for the larger student population and this may also be true for the Native American student population (Stinchfield, 2011). Casino gambling was first measured in 1998 and underage rates have been fairly consistent from 1998 to 2010. Online gambling was first measured in 2007 and underage rates have been consistent from 2007 to 2010. More underage boys gamble than girls for all three legalized forms of gambling. The rates of underage gambling by Native American Alone students, particularly casino gambling, are surprisingly high, 20.9% and underage lottery play is reported by 10.9%. While it is not hard to imagine how underage youth gain access to lottery products, it is more difficult to

imagine how underage Native American youth access casino gambling and it would appear that some are getting past security guards and casino staff in order to gamble in casinos.

Correlates of Gambling

The third specific aim is to identify correlates of gambling. The purpose of this analysis is to search for possible causes and mediators of gambling behavior among Native American students, which may serve as risk factors for the development and maintenance of excessive gambling and may play a role in the development, duration and severity of problem gambling (Stinchfield, 2004). This analysis found a number of correlates that accounted for nearly one-third of the variance in gambling. These correlates could be described as other high risk behaviors, including smoking cigars, alcohol use, running away from home, skipping school, sexual behavior, and hitting or beating up another person. There were some similarities and differences between boys and girls, namely, both boys and girls correlates included cigar smoking, and differences were that boys had alcohol use, skipping school, and sexual activity and girls had running away from home, participating in a mentoring program, and hitting or beating up another person. Greater involvement in gambling was associated with greater involvement in these antisocial and/or risky behaviors and it makes sense that youth who are involved in excessive gambling would also participate in other high risk behaviors, particularly other addictive behaviors such as tobacco use and alcohol use. There was one correlate that is less easily explained, that is, girls participating in a mentor program. While it is not clear why participating in a mentor program is associated with gambling, it could be that these girls have been selected for mentor programs because of prior high risk behaviors such as tobacco use or running away or fighting. The correlates reported here are similar to those reported in other studies, including tobacco use, alcohol use, and antisocial behaviors (Gupta & Derevensky,

1998, Stinchfield, 2000; Vitaro, et al, 2001; Wynne, Smith & Jacobs, 1996) (See Stinchfield, 2004 for a review of correlates of youth gambling).

Comparison of Native American Alone, Native American mixed race, and White Students on problem gambling

The fourth specific aim is to compare the three groups on endorsement of two problem gambling items and compare rates of endorsement of these two items over time, from 1992 to 2004. These two items measure symptoms of problem gambling and can be considered screening items for problem gambling. Native American Alone students exhibited higher endorsement rates of problem gambling items than both Native American Mixed Race and White students. Endorsement rates of problem gambling items for Native American Alone students from 1992 to 2004 were stable and all rates from 2001 to 2004 showed modest declines and boys showed statistically significant declines for the “felt bad” item and for endorsing either item. One in ten Native American Alone students are reporting experiencing at least one symptom of problem gambling. While one symptom does not indicate that the student has a serious problem, it does indicate the student is starting to experience negative consequences from their gambling and may be in the early stage of developing problem gambling.

One of the values of this study is the large sample of Native American youth. The sample sizes in this study are larger than any other studies reported thus far on Native American youth gambling and therefore serve as one of the foremost sources of Native American youth gambling information. The value of having such a large sample is that it allows for an accurate measurement of gambling for the population. Another value of this study is the recurring assessments on a three year interval that allows for monitoring gambling trends over time. This study shows both a recent picture of Native American gambling as well as a historical

perspective on gambling trends starting in 1992.

This study has at least five limitations, some of which have been identified previously (Stinchfield, 2001; 2011). First, this survey was not intended to be a comprehensive measure of gambling behavior and it includes only six gambling frequency items and two problem gambling screening items. Adolescents may play other games that were not included in this survey (e.g., dice). Gambling on these other games could raise the overall rate of gambling. A second limitation is a possible sample bias, in that surveys were administered to Native American youth who were attending school. Those students who have dropped out of school, been suspended or expelled, or who are absent were excluded and they may be more likely to gamble than students in school. This potential sample bias increases with each advancing grade, so that the 12th grade estimate is most affected by this potential sample bias. Some Native American youth were not represented in this study. This study does not measure gambling among Native American youth out of school, for example, Native American youth in alternative learning centers and juvenile corrections settings. Therefore a future research direction should be to measure gambling by Native American youth out of the mainstream and compare their rates to mainstream youth. A third limitation is that this study does not include students from all grades that are commonly included in youth gambling surveys. Therefore, it does not include a complete assessment of an age/grade effect. A fourth limitation is that this study relies on self-report data and this raises the question of response bias. There is no objective, independent corroboration of a student's responses, however, methods were utilized that enhance the validity of self-report data. These methods include providing and assuring the student of anonymity and confidentiality, administering the survey in a controlled environment, and then finally, checking students' responses for inconsistencies and improbable answers which suggest invalid responding and

eliminating those cases from the database (3%) whose responses suggest that they were not giving valid information (Minnesota Student Survey Interagency Team, 2010a). A fifth limitation is that the data does not indicate whether the Native American youth lives on or off reservation. There may be differences related to gambling between Native American youth on and off reservation but it is not possible to make this comparison in this study.

There are some findings in this study that raise concerns. First, there are two trends that appear to be somewhat at odds. On the one hand, fewer Native American youth are gambling in 2010 than in 1992. On the other hand, there is a small but substantial segment of the Native American youth population that are frequent gamblers and this segment has remained fairly stable from 1992 to 2010. A second concern is the finding that a greater proportion of Native American youth are frequent gamblers (19.7%) than Native American Mixed race peers (10.9) and White students (7.8%). The concern is that if more Native American youth are gambling frequently than their peers, they may also be at greater risk of developing problem gambling. Future research will need to address why there are a greater proportion of frequent gamblers among Native American students than among their non-Native American peers and whether these rates can be lowered. A third concern is that there are underage Native American youth who report gambling on legalized games including the lottery, casino, and online gambling. Underage youth can obtain lottery products by having people of legal age buy lottery tickets for them. Underage youth can access online gambling sites by lying about their age and using someone else's identification. While it seems relatively easy for underage youth to access lottery tickets and online gambling, it seems less likely that they could access casino gambling because they must physically walk through the front door and pass a security guard or casino staff and may need to present identification to verify that they are of legal age. They must also gamble at

card tables or slot machines in view of casino staff, all of which raise a concern about casino security and suggests that casino efforts to prevent underage patrons are not completely effective. Adlaf, Paglia-Boak, and Ialmitianu (2006) found that about 1% of underage youth in Ontario reported gambling in a casino. Underage gambling is a concern for the lottery and tribal casinos and additional efforts should be put in place to prevent underage gambling. It is also possible that underage Native American youth are reporting underage gambling when in fact they are not buying lottery products, or gambling in a casino or online. This is a possibility, however, methods were in place to prevent this type of response distortion in this survey administration, namely the assurance of both confidentiality and anonymity; and students who exhibit signs of exaggeration were removed from the database. Nevertheless, false responses are possible and the question of underage gambling and its relation to invalid responding needs further research attention, particularly the corroboration of this self-reported underage gambling.

In conclusion, there were fewer Native American students gambling in 2010 than were gambling in 1992 and this has been a gradual and consistent decline. There were fewer underage Native American youth playing the lottery in 2010 than in 1992. There is a small but significant proportion of the Native American youth population that gamble frequently and this proportion has remained relatively stable from 1992 to 2010. The proportion of frequent gamblers is higher in the Native American youth group than in Native American Mixed race and White students and this difference is most striking among girls. There is a subgroup of the Native American youth population that gambles frequently and may gamble to excess and these youth may need prevention and intervention services. The goal of this research is to gain a better understanding of gambling among Native American youth so methods to prevent the development of problem gambling can be implemented and thus improve the health of Native American youth.

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Author Notes

While the terms American Indian and Native American are both used in this report, the term “Indian” was an erroneous label applied to native or aboriginal peoples of America and the author prefers the label “Native American”, so as not to continue the erroneous term and also to prevent confusion when referring to people who are from India. This study was conducted with funds from the State of Minnesota to the Northstar Problem Gambling Alliance, Roseville, Minnesota. The Minnesota Student Survey data was provided by public school students in Minnesota via local public school districts and managed by the Minnesota Student Survey Interagency Team (2010a; 2010b; 2010c). This study also received support from the Center for Excellence in Gambling Research Award from the National Center for Responsible Gaming and the Institute for Research on Gambling Disorders. I would also like to thank the Northstar Problem Gambling Alliance Board of Directors, Dr. Thomas Peacock, Amanda Symmes, and Ellina Xiong for their helpful suggestions.

Appendix A

Research Questions Revisited with Answers

- How many Native American youth gamble and how many gamble frequently? 69% of boys and 47% of girls gambled; 25% of boys and 12% of girls gambled frequently
- What games do Native American youth play most frequently? Boys bet on games of personal skill, cards, and sports; Girls play lottery, cards, and bet on sports
- Are Native American youth more involved in gambling now than in the past? No, there are fewer gambling now than in the past; in terms of frequent gambling, about the same number are gambling now than in the past
- Are Native American youth more involved in gambling than their non-Native American peers? Yes, more Native American youth gamble, gamble frequently and gamble underage than White youth
- How many underage Native American youth gamble on the lottery and in casinos? 21% play lottery games and 11% report gambling in a casino
- Do more Native American youth gamble underage now than in the past? Fewer play lottery games now than in the past; about the same report gambling in a casino now as in the past
- Are Native American youth more involved in underage gambling than their non-Native American peers? Yes, 21% report playing lottery compared to 9% of White youth; 11% report gambling in casinos compared to 3% of White youth
- Do more Native American youth report gambling problems than their non-Native American peers? Yes, 9% report feeling bad about what happens when they gamble

compared to 7% of White youth; 6% report that they would like to stop gambling but do not think they can compared to 3% of White youth