THE IOWA CONSORTIUM
FOR SUBSTANCE ABUSE RESEARCH AND EVALUATION

IYS 2012: Problem Gambling Questions Report

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EXECUTIVE SUMMARY

The following report addresses four questions on youth gambling behaviors using 2012 Iowa Youth Survey (IYS) data:

- Who gambles among 6th, 8th, and 11th graders in Iowa?
- What are the significant types of gambling among youth; do they differ between boys and girls and do they change across grades?
- Where in the state are the highest rates of gambling among youth?
- Is youth gambling related to other factors?

The analysis focuses on IYS questions that asked if the respondent ever gambled, won or lost over $25 in a day, gambling frequency for a number of activities, and whether or not they had arguments with family or friends about gambling. The IYS included responses from over 70,000 6th, 8th, and 11th graders. These were meant as preliminary analyses and are not exhaustive or definitive.

Who gambles among 6th, 8th, and 11th graders in Iowa? While females gamble, most gambling is done by males. Among males, but not females, gambling increases with older grades. Some minority groups (i.e., African American, American Indian) are more likely to have gambled. Students' living arrangements and parental military involvement also affect the likelihood of student gambling.

What are the significant types of gambling among youth; do they differ between boys and girls and do they change across grades? Among the types of gambling, card games with friends and family and wagers on sports were most common. Internet gambling, dice, and lottery were the least common. The patterns are fairly consistent across sexes and grades, with the minor exception of video/arcade games being somewhat more popular with males. For past year gambling, the largest increases appear up to and including grade 8 in males.

Where in the state are the highest rates of gambling among youth? There appear to be real differences among counties for gambling behavior rates. Some counties seem to have more consistently high levels than would be expected by chance. Very simple analyses did not support the idea that the county's rate of gambling behavior among students is related to whether or not a casino was present in the county.

Is youth gambling related to other factors? All levels of gambling behavior were significantly associated with the student's thoughts of suicide. This was particularly true for past 12-month gambling on all queried activities. Increasing frequency of gambling over the past year correlated with higher percentages of students saying that they seriously thought of killing themselves. Gambling behaviors were also associated with alcohol use, binge drinking, tobacco use, and drug use.

Recommendations:

- Prevention efforts should target young males, before the 8th grade.
- Continue more in-depth analyses on potential casino location effects.
- Consider using gambling behaviors as an indicator/risk factor for substance use and mental health problems.
- Ensure that adolescents in gambling treatment programs receive substance use and mental health screenings.

2012 Iowa Youth Survey

The 2012 Iowa Youth Survey (IYS) is the 14th in a series of surveys completed every two or three years since 1975. The survey is conducted with students in grades 6, 8, and 11 attending Iowa public and private schools. In this administration, 70,770 validated records were received from September 24, 2012 through November 9, 2012. The IYS includes questions about students' behaviors, attitudes, and beliefs, as well as their perceptions of peer, family, school, neighborhood, and community environments.

Records came from 255 of Iowa's 348 public school districts (73%), and from 21 of the 175 non-public schools (12%) for students enrolled in grades 6, 8, or 11. Additional districts may be included (e.g., when districts whole grade share, when multiple districts reported the same district number, when districts shared their unique Survey Monkey URLs, etc.). The 70,770 validated records received from students completing the IYS represented all 99 counties in Iowa. Nearly all Iowa counties were represented by a minimum of 200 students each.

The Gambling Section of the IYS includes one skip out question (i.e., "*Have you ever bet or gambled for money or possessions?*") and nine follow-up questions. Overall, 26.7% of the 69,483 students who responded to this question said that they had ever gambled.

Roughly equal numbers of 6th, 8th, and 11th graders were included as were roughly equal numbers of male and female students. These counts are shown in Table 1.

Table 1: Number of Students Responding to the 2012 IYS

Grade	Male	Female	Total
6th	12,263	11,808	24,071
8th	12,332	11,887	24,219
11th	11,109	10,815	21,924
Total	35,704	34,510	70,214*

**Note: 343 students omitted their grade information*

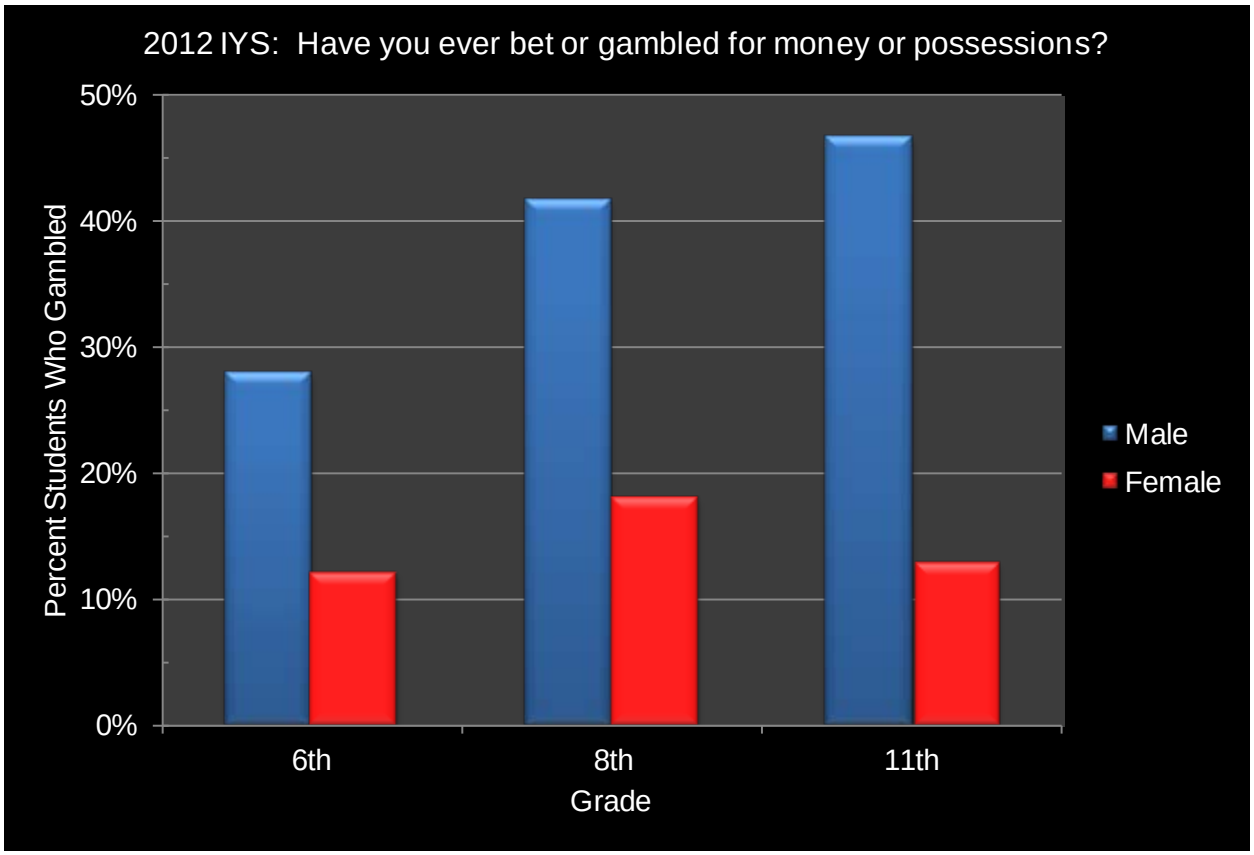
Gambling Among Youth in Iowa

There is some research literature on the epidemiology of gambling and gambling problems among youth and adolescents. To our knowledge, there has not been research on the demographic risk factors for Iowa students. The IYS provides a unique source for such evaluations.

Grade and sex of students

Males are more than twice as likely to have ever gambled compared to females, 38.5% versus 14.4%.[1] Overall, 20.1% of 6th graders reported gambling. The percentages of 8th and 11th graders who gambled were very similar (30.1% and 30.0%) and significantly higher than the 6thgraders.[2] However, the pattern of gambling for males and females differed markedly over the grades as shown in Figure 1.[3]

Figure 1: Percent Students Who Ever Gambled by Grade and Sex.



There is a clear increasing trend for males but a much weaker trend for female students.

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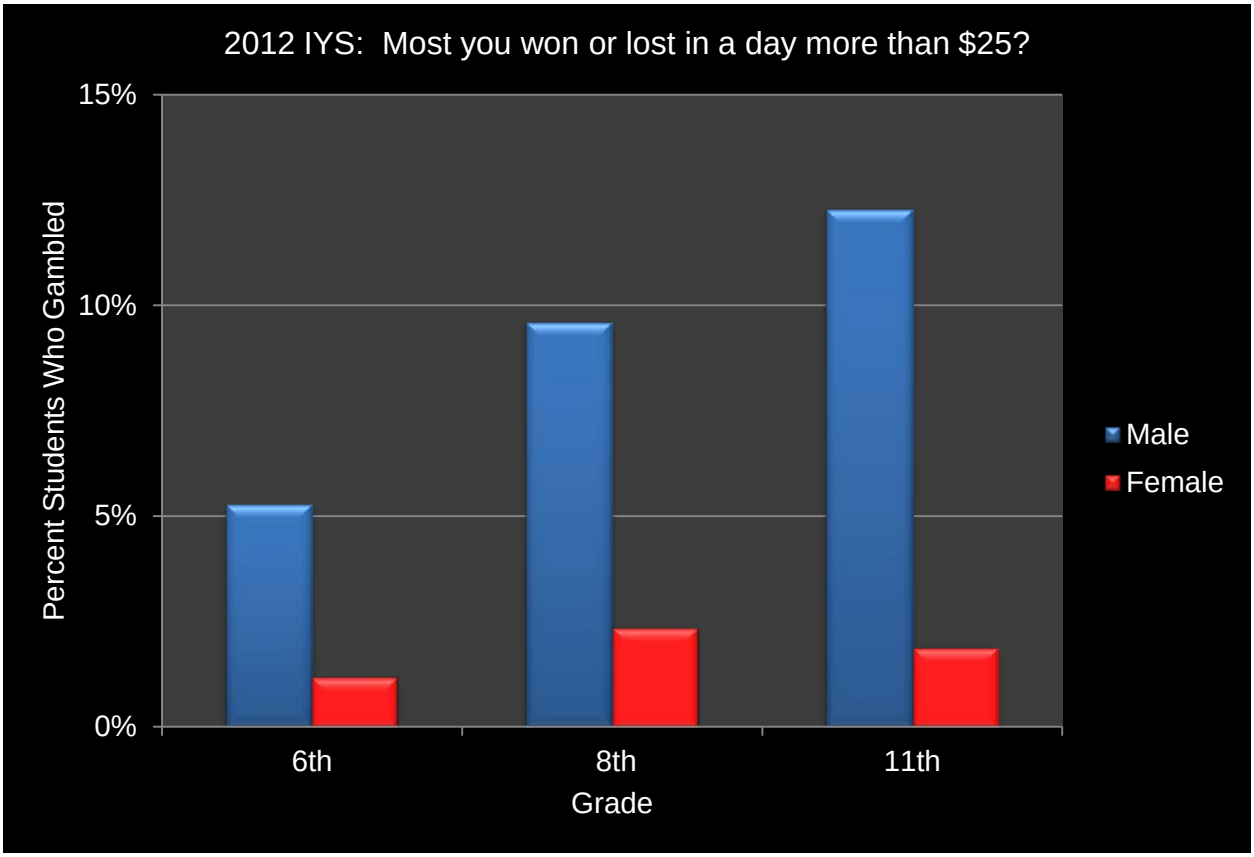
[1] *Logistic regression: Wald $\chi^2 = 4756.63$, df = 1, $p < 0.0001$*

[2] *Logistic regression: Wald $\chi^2 = 579.25$, df = 2, $p < 0.0001$*

[3] *Logistic regression: Wald $\chi^2 = 263.93$, df = 2, $p < 0.0001$*

Figure 2 shows a similar pattern using the amount of money lost or won on a given day. The 12-month prevalence of winning or losing over $25 increases dramatically for males from grade 6 to grade 11. Female students show a much smaller trend.

Figure 2: Percentage of Males and Females Winning or Losing More than $25 on a single day Within the Last Year.



Relatively few students reported having argued with friends or family about their gambling, 4.2% of male, and 1.4% of female students reported such arguments. Interestingly, there is a slight, but statistically significant, downward trend over the grades for both males and females.[4] Over all, the percentages of students reported arguments in 6th, 8th, and 11th grades were 3.1%, 3.0%, and 2.5%.

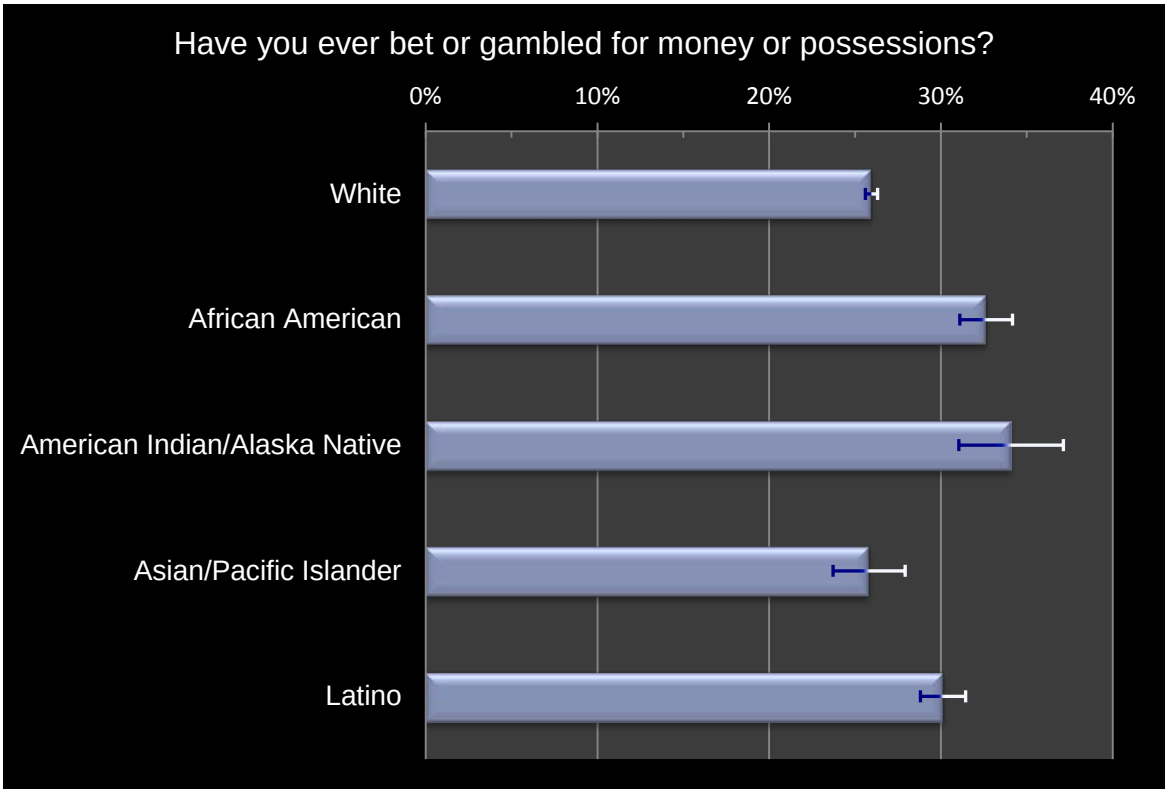
[4] *Trend test (Wilcoxon) z = -4.14, p < 0.001*

Students' race, ethnicity, and living arrangements

Race/ethnicity

There were significant differences among students' racial/ethnic groups who reported ever having gambled.[5] Figure 3 shows the different percentages for each of the racial/ethnic groups. Because the sample sizes varied considerably, 95% confidence intervals also appear. White (26.0%) and Asian (25.8%) students had the least lifetime exposure. Latino students had somewhat higher percentage (30.1%). African American (32.6%) and American Indian (34.1%) students had the highest percentages. Further analyses suggest that these differences are fairly consistent across grades and sex.

Figure 3: Percent Students Who Ever Gambled by Race/Ethnic Group



A similar but even stronger pattern was seen when using the winning or loss of over $25 within the last year.[6] White students were least likely to have won or lost over $25, 4.7%. American Indian or Alaska Native students were more than 3 times as likely as White students (odds ratio = 3.15). African American and Latino students were more than twice as likely to win/lose over $25 as White students (odds ratios = 2.4 and 2.1, respectively). Asian/Pacific Islander students had a slightly elevated chance (odds ratio = 1.44).

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[5] *Logistic regression: Wald $\chi^2 = 100.12$, df = 4, $p < 0.0001$*

[6] *Logistic regression: Wald $\chi^2 = 459.76$, df = 4, $p < 0.0001$*

The same pattern of race/ethnicity was seen again regarding students having arguments about their gambling with family or friends.[7] White students reported arguments least often (2.4%), followed by Asian (4.3%), Latino (5.1%) students. American Indian (6.6%) and African American (6.3%) reported the highest percents.

Living Arrangements

The student's living arrangement also had a significant relationship to their likelihood of ever gambling.[8] These effects are shown in Figure 4. Those children living with both parents had the lowest chance of having gambled (25.8%). Students living with one parent (28.3%) followed this closely. Students living in shelter care and students who reported independent living were more than twice as likely to have ever gambled (≥ 60%). Those living with their grandparents or other relatives, with foster parents, a residential group home, or other tended to have percentages between 30% and 34%.

Figure 4: Percent Students Ever Gambling and Their Living Arrangements

The pattern for students reporting winning or losing over $25 in a day was identical to that seen for ever gambling with regard to the living arrangements.[9] Nearly half of students in shelter care (49.3%) reported winning/losing over $25, followed by 36.3% of those living independently. Less than 10% of students living with either or both parents, with their grandparents, or other reported winning or losing this amount of money.

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[7] *Logistic regression: Wald $\chi^2 = 323.89$, $df = 4$, $p < 0.0001$*

[8] *Logistic regression: Wald $\chi^2 = 171.44$, $df = 7$, $p < 0.0001$*

[9] *Logistic regression: Wald $\chi^2 = 475.65$, $df = 7$, $p < 0.0001$*

The pattern repeated for reported arguing about gambling.[10] Those students in shelter care reported arguments 25% of the time, while those living with both parents reported arguments 2.5% of the time.

Students in military families

The 2012 IYS asked students about the military and deployment status of their parents and there were significant effects with regard to the student's ever gambling.[11] Among students whose parents were not in the military, 26.5% indicated that they had ever gambled. Students whose parents were in the military but had not been deployed in the past year responded slightly more often with 30.3% to the ever gambled question. Those students whose parents had been deployed but returned within the last year (31.8%) and those whose parents were currently away for military service (32.3%) had very slightly higher rates of lifetime gambling. As mentioned while these effects were statistically significant, the differences are relatively small.

Parental military status and deployment had a significant effect on the students reporting they won or lost over $25 within the last year.[12] Children who had a currently deployed parent had roughly 3 times the chance of reporting a win/loss of this amount. Children of parents who had recently returned and those that had not been deployed were moderated but still roughly twice as likely to have won/lost more than $25 compared to children with whose parents were not in the military.

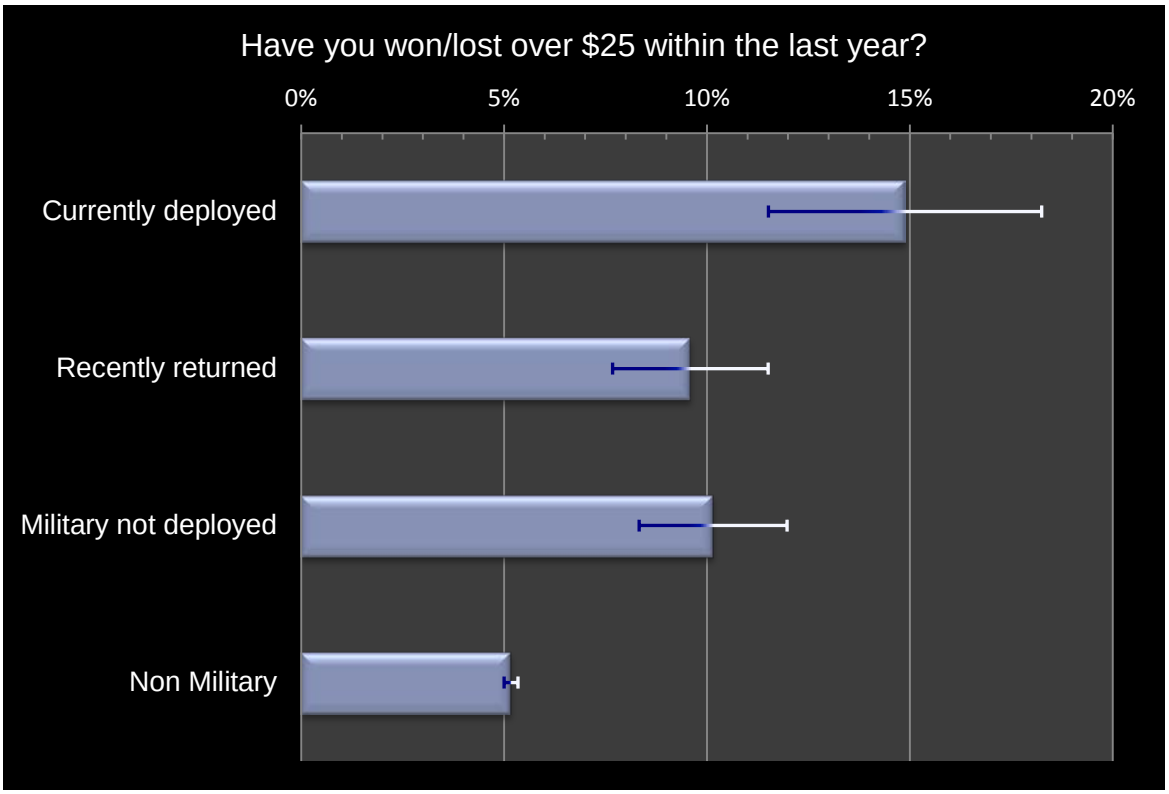
Follow-up analyses suggested that the effect of parental military involvement and deployment appeared consistent for male and female students. However, there was some indication that the effect of parental deployment may accentuate the number of children reporting with gambling wins/losses greater than $25.

[10] *Logistic regression: Wald $\chi^2 = 298.94$, $df = 7$, $p < 0.0001$*

[11] *Logistic regression: Wald $\chi^2 = 26.58$, $df = 3$, $p < 0.0001$*

[12] *Logistic regression: Wald $\chi^2 = 149.56$, $df = 3$, $p < 0.0001$*

Figure 5: Percentages of Students who Won/Lost Over $25 and Their Parents' Military Involvement



The pattern of percentages of students reporting arguments with friends and family was nearly identical to the pattern of results for percentages of students who won/lost over $25. Of the students whose parents were not involved with the military, only 2.7% reported arguments. Children whose parents were currently deployed reported a percent nearly 4 times that amount (10.2%). The children of recently returned and not deployed parents were in between with 6.1% and 5.4% reporting arguments.

Summary

There are basic risk factors for student gambling and potential problem gambling. Being a male was a significant risk factor and the effect for males increased with age. Being a minority, particularly African American and American Indian students, increased the chances of gambling behavior and potential problems with gambling.

Children in sheltered housing and independent living arrangements also had elevated risk of gambling issues. To a lesser extent, children whose parent was currently deployed also had an increased risk for potential gambling problems.

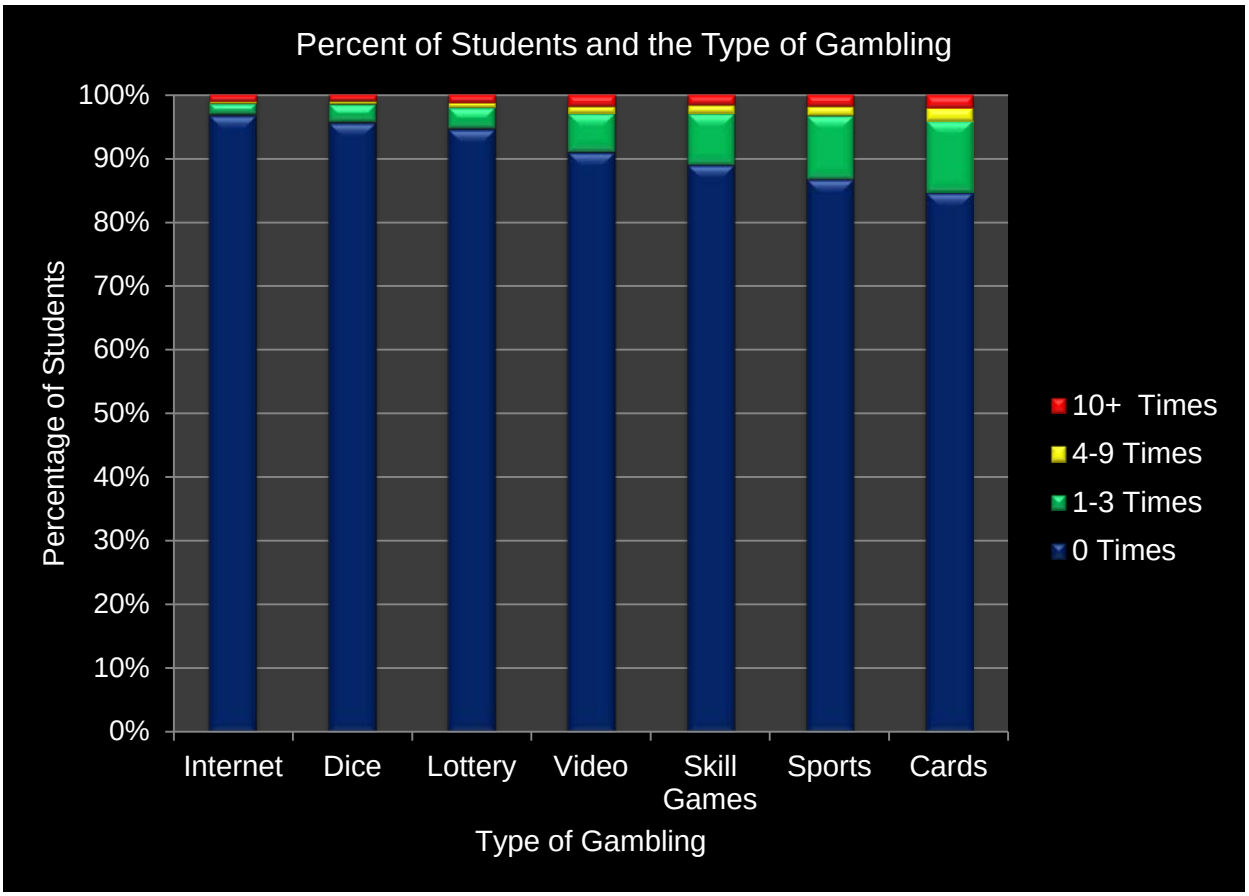
Significant Types of Gambling Among Youth in Iowa

The IYS asks students about the type and frequency of gambling they have engaged in during the last 12 months. The questions began with "During the past 12 months how many times have you bet or gambled for money or possessions in any of the following ways:"

- Sports?
- Card games with friends or family?
- Internet?
- Personal skill games such as pool, bowling, or dominoes?
- Video or arcade games?
- Dice games?
- Lottery scratch off tickets or numbers?

Figure 6 shows the types of gambling ordered from least often mentioned to most often mentioned.

Figure 6: Percentages of Students Who Gambled Within the Last Year at Various Games



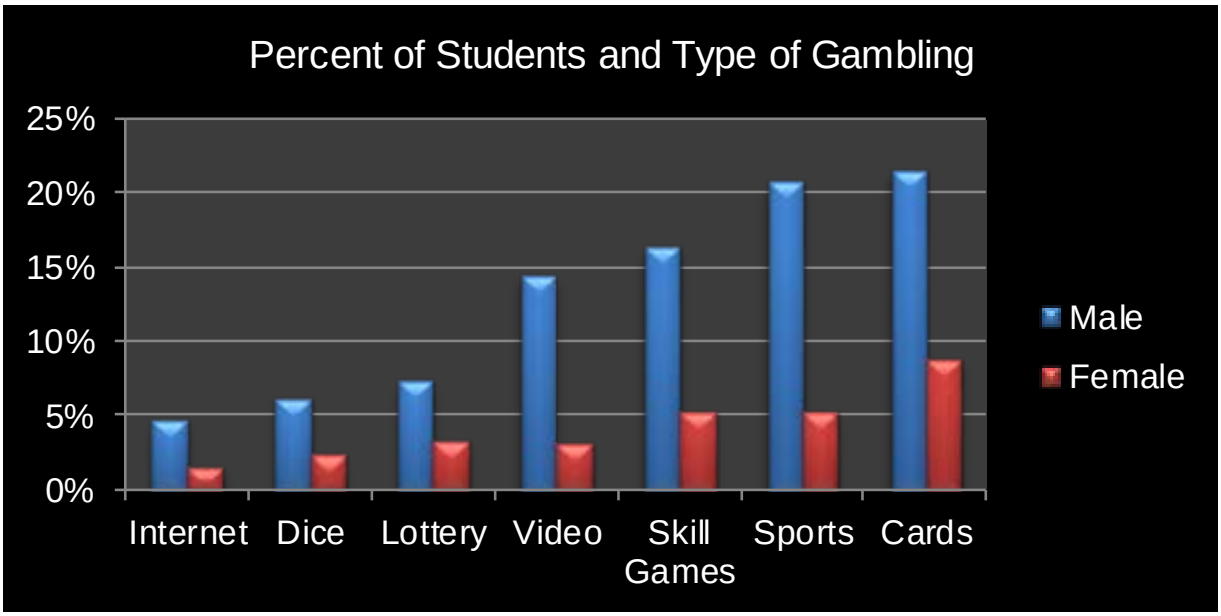
The most common gambling activity involves cards with friends or family, with 15.3% students gambling at least once in the last year in this activity. This is followed by sports (13.1%) and

skill games (10.9%). High frequency gambling (10 or more times in the last year) generally followed the same order. Playing card games 10 or more times was reported by 1.9% of the students, followed by betting on sports events (1.7%). Internet gambling was the least frequent. Less than 2% of all respondents indicated that they gambled 10 or more times on any of the listed activities.

Patterns of Gambling at Least Once -- Type of Gambling

Males and females differed on whether or not they gambled at least once during the year on all types of activities. The largest differences between males and females were apparent with the more common activities, e.g., sports and cards (See Figure 7). Video/Arcade games also showed a large difference.

Figure 7: Percentages of Students Who Gambled at Least Once Within the Last Year in Various Activities.



There were interesting patterns of differences across the student grade levels as seen in Figure 8. The 8th and 11th grade percentages are consistently similar across all of the gambling activities. Based on these data, it appears that the largest increase in gambling behaviors occurs between the 6th and 8th grade. The effect is most noticeable with the more frequent activities. Thus, students appear to be introduced to gambling behaviors during this time period (between 6th and 8th grade) and relatively few new students are added after the 8th grade.

Figure 8: Percentages of Students at Each Grade Level Who Gambled at Least Once Within the Last Year in Various Activities.

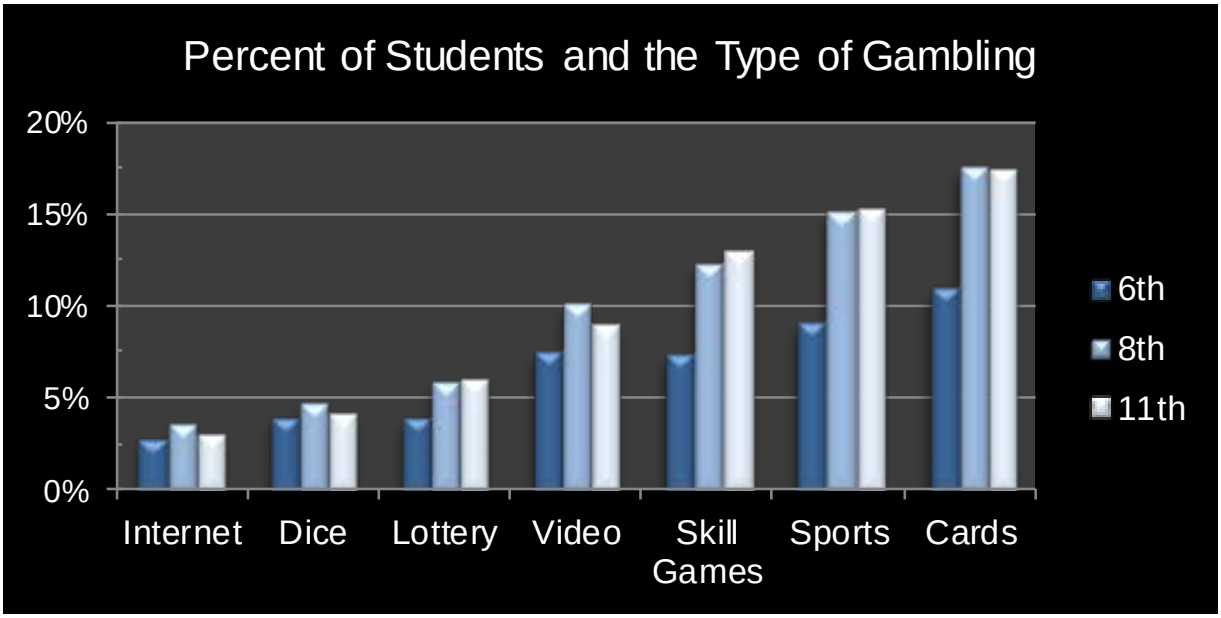
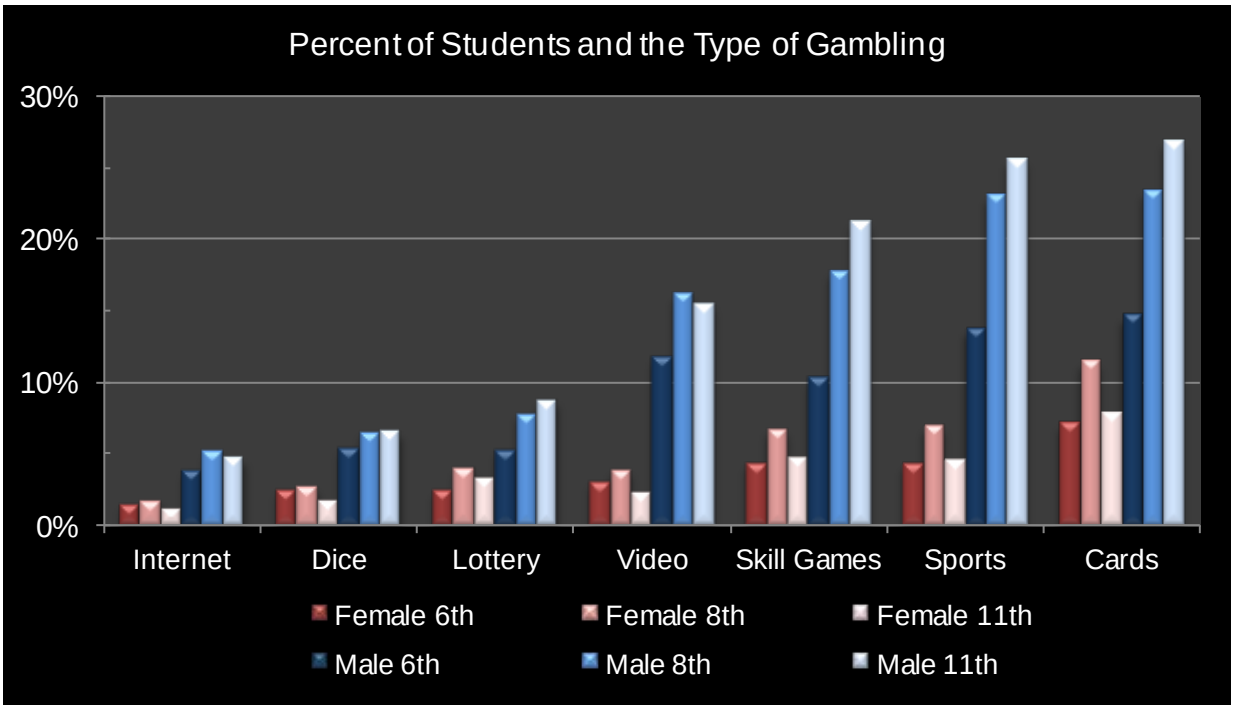


Figure 9 drills down to sex and grade of student. Here females show a relatively stable set of percentages for all activities. Males show the largest differences across activities and across grades. However, the pattern is very similar only accentuated. Most increases in gambling occur with the more popular activities and most of the increase takes place between the 6th and 8th grade.

Figure 9: Percentage of Students Who Gambled at Least Once Broken Down by Activity, Sex and Grade.



Patterns of Frequent Gambling -- Type of Gambling

Frequent gambling, defined as 10 or more times in a year for an activity, is relatively infrequent for all groups. Less than 1 in 20 students gamble 10 or more times on any activity over the last year. Frequent gambling is more often seen in the more popular activities. For example, the most likely activity playing cards with friends or family members, also has the highest percentage of students who play frequently, 1.9%. This is closely followed by gambling on sports (1.7%). Frequent internet gambling or frequent gambling on dice is relatively rare, with both less than 1%.

Frequent gambling is strongly related to potential gambling problems. Students who frequently gamble on any activity are:

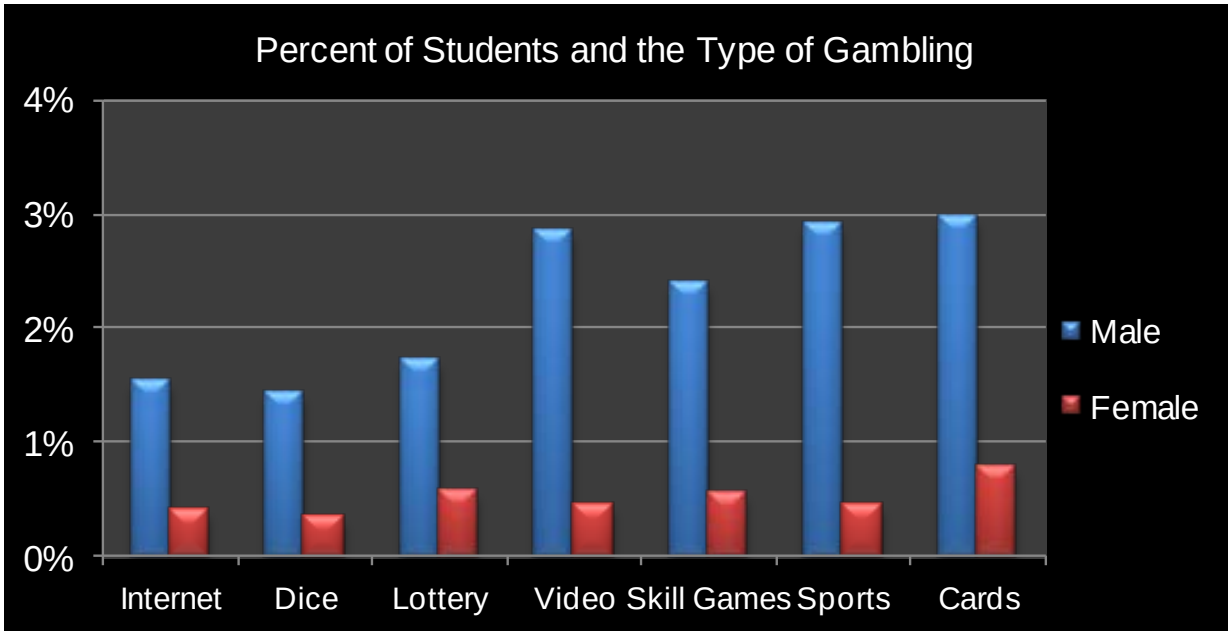
- More than 17 times more likely to argue with family or friends about their gambling.[13]

[13] *Odds ratio = 17.24, Wald z = 55.98, p < 0.0001*

- Almost 30 times more likely to have won or lost over $25 in the last year.[14]

Percents of frequent gambling activities, separated for males and females, appear in Figure 10. With the exception of video/arcade games, the patterns across activities appear similar. However, males are approximately 1 to 2 percentage points more likely to show frequent gambling than females. Males also are particularly more likely to frequently wager on video/arcade games.

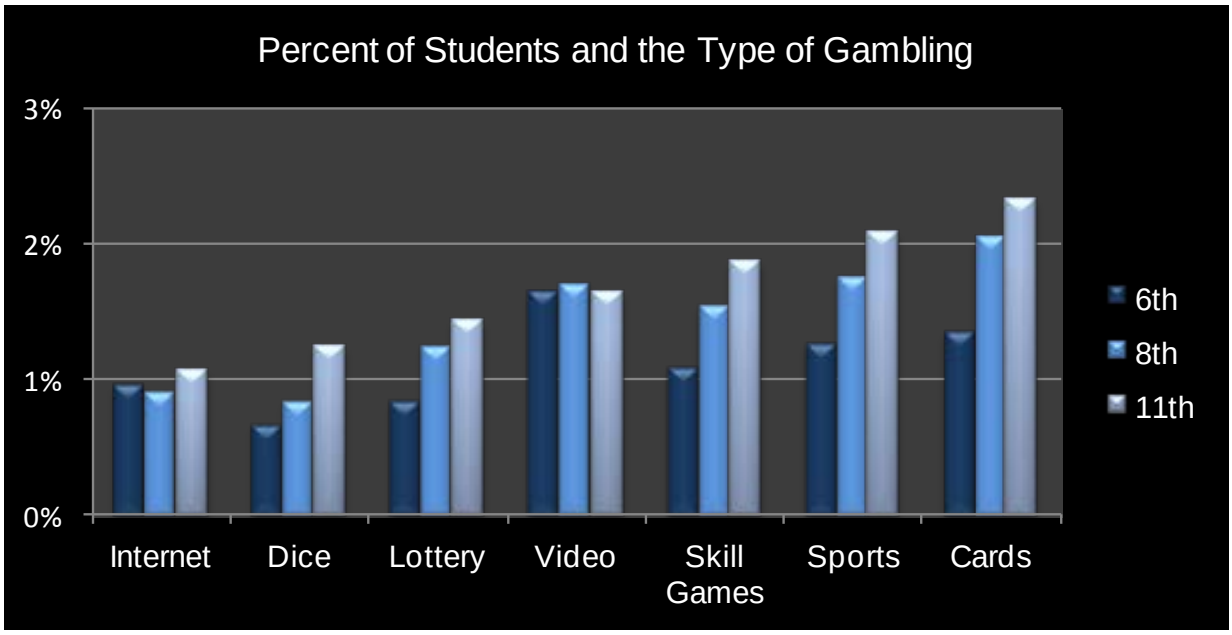
Figure 10: Percentage of Students Who Frequently Gambled at Least Once Broken Down by Activity and Sex.



[14] *Odds ratio = 29.93, Wald z = 80.28, p < 0.0001*

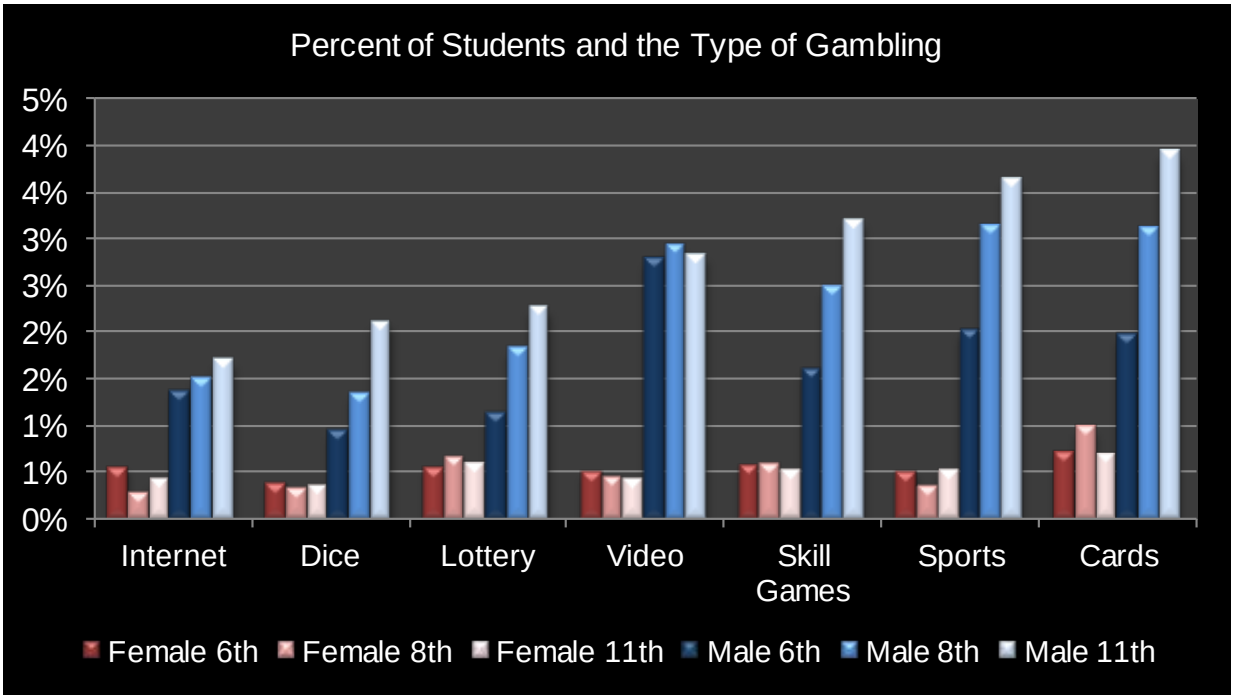
For most activities, frequent gambling increases with advancing grades (see Figure 11). The exceptions were frequent internet and video/arcade games. Internet gambling was infrequent for all grades. On the other hand, video/arcade games maintained their moderate status from 6th grade on.

Figure 11: Percentage of Students Who Frequently Gambled at Least Once Broken Down by Activity and Grade.



The increasing percentages across grades are most noticeable among male students (see Figure 12). Female students rarely frequently gamble, and maintain that status across all grades.

Figure 12: Percentage of Students Who Frequently Gambled at Least Once Broken Down by Activity, Sex, and Grade.



Summary

Cards, sports, skill games, and video/arcade games were the most popular activities for gambling. This popularity was mainly attributed to male students. Female students tended to gamble infrequently. For male students, the frequency of past year gambling increases from 6th to 8th grades. Frequent gambling also increases with each surveyed grade; again, mostly in males. Internet gambling was infrequent in males and females and showed little increase with older students. Video/arcade game betting was also an exception and appeared to remain stable over the grades.

Rates of Gambling Among Youth in Iowa

This section includes color coded county maps showing the percentages of students who reported:

- Ever having gambled/bet,
- Won or lost over $25 in a day, and
- Argued with family or friends because of gambling.

Because there are varying numbers of students within each county who took the IYS, the reliability of each county's percentage also varies.

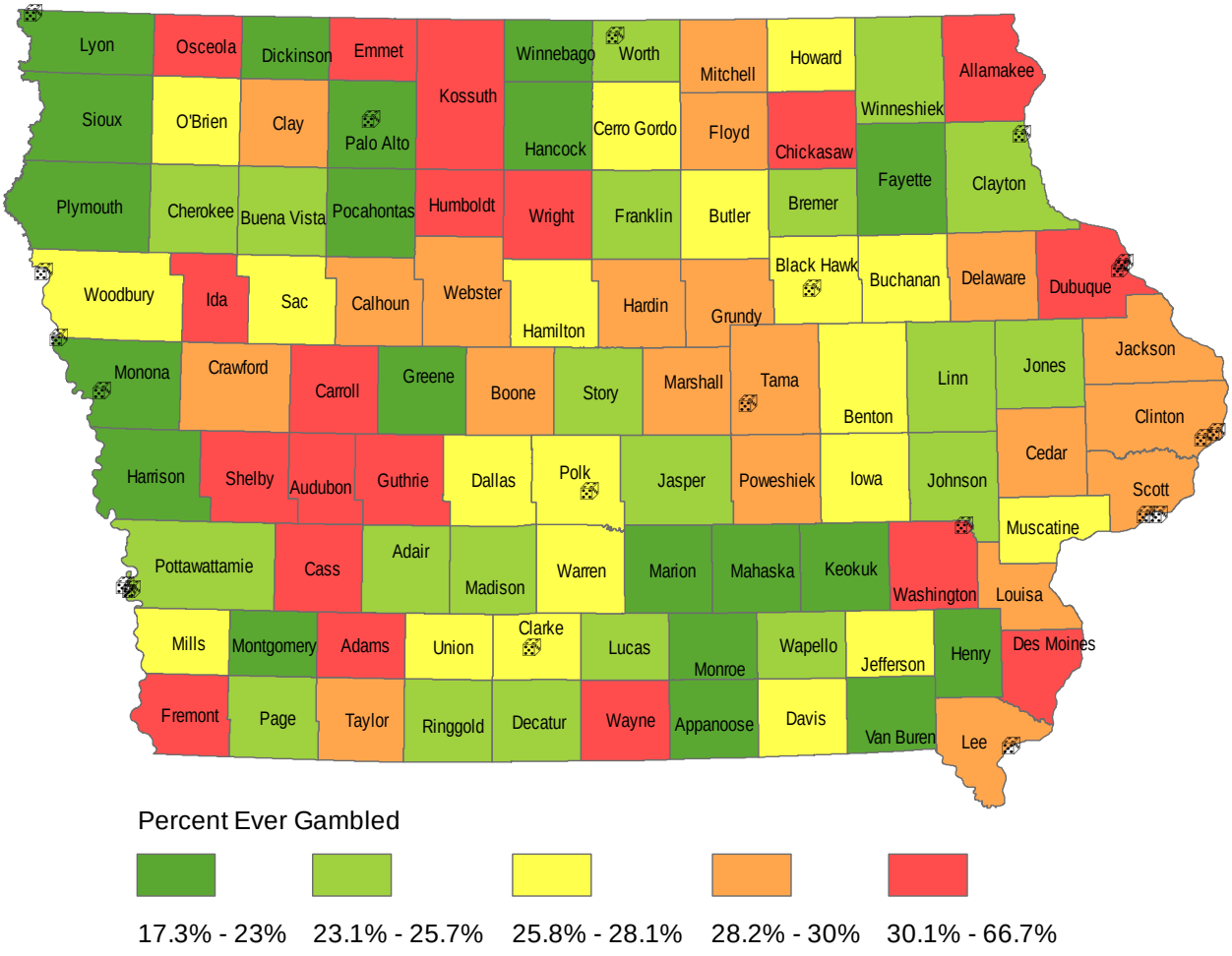
Furthermore, differences among counties are affected by chance variation to some extent. We conducted analysis to estimate the reliability of the county estimates, i.e., how much of the differences in the county maps might be due to chance.[15] Based on our reliability analysis, the differences among counties were significantly and moderately based on real differences among counties. For the "ever gambled" question, approximately 70% (69.4%) of the variability between counties represents “actual” differences. The reliabilities of county differences for the other questions were slightly less than that. This also means that much of the county differences present random error, which would be expected to vary from time to time by chance. This also means that a substantial amount of the observed differences among the counties represents random noise. Of the three maps, the first regarding students' ever gambling is the most reliable. Each map breaks the counties into roughly 5 equal groups of counties, with red marking the top highest percentages. Casino locations are also indicated on the maps.

[15] *Arndt, S., Acion, L., Caspers, K. & Diallo, O. Assessing community variation and randomness in public health indicators. Population Health Metrics. 9, 3 (2011).*

County Maps

The county map for IYS question B47, "*Have you ever bet or gambled for money or possessions?*" appears as Figure 13.

Figure 13: Percent Students Who Ever Gambled by Iowa County.

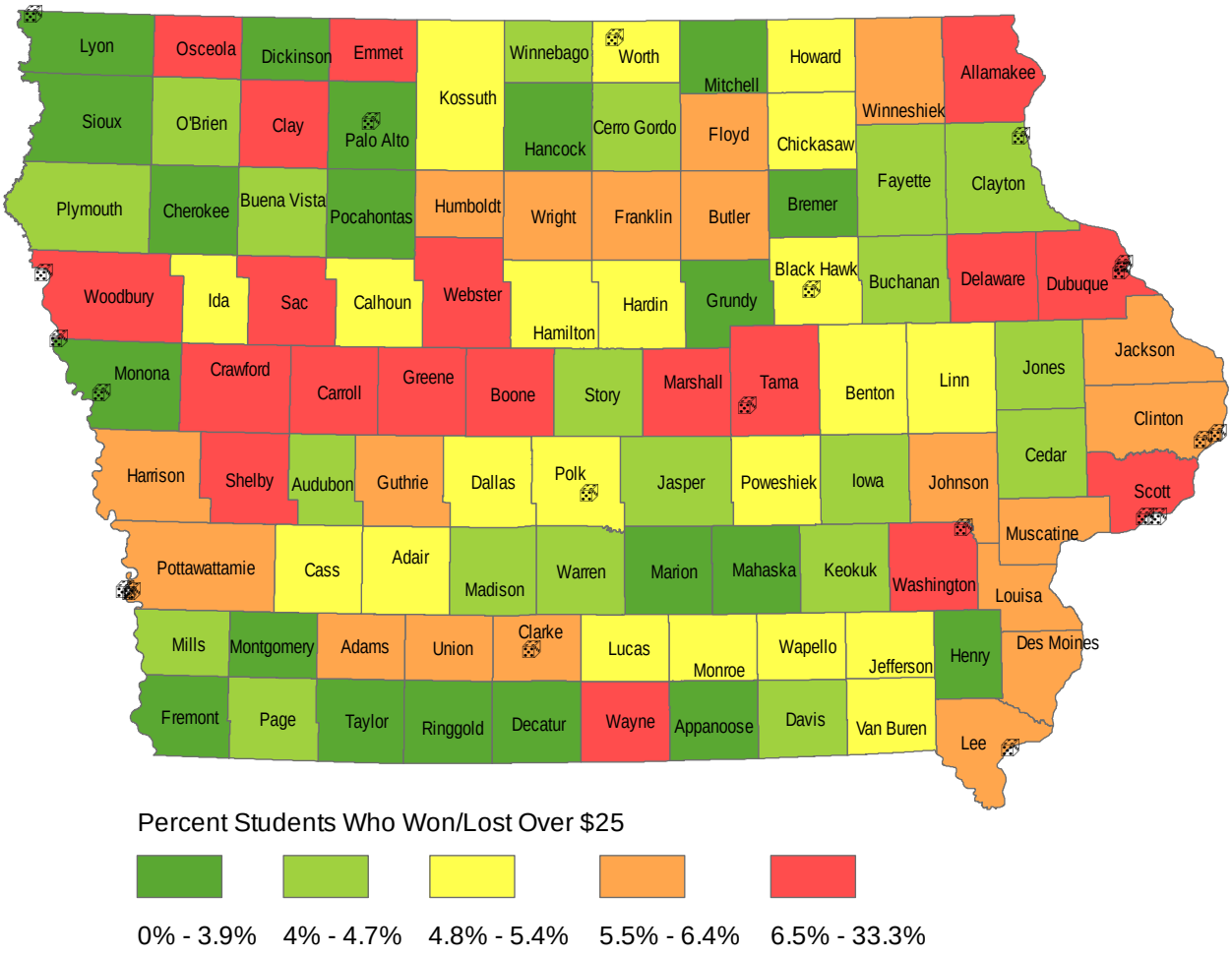


There was no statistical correlation between a county having a casino or not on their lifetime prevalence of student gambling.[16] For example, while Dubuque County had casinos and was among the highest for students ever gambling, Monona County also had casinos but was among the lowest in gambling prevalence.

[16] *Mann-Whitney U-test, z = -.16, p > 0.87*

County's rankings for percent of students who won or lost over $25 in a day appear in Figure 14. There was no statistical association between having a casino and the percentage of students.[17] Casinos occur in counties with high, middle, and low levels.

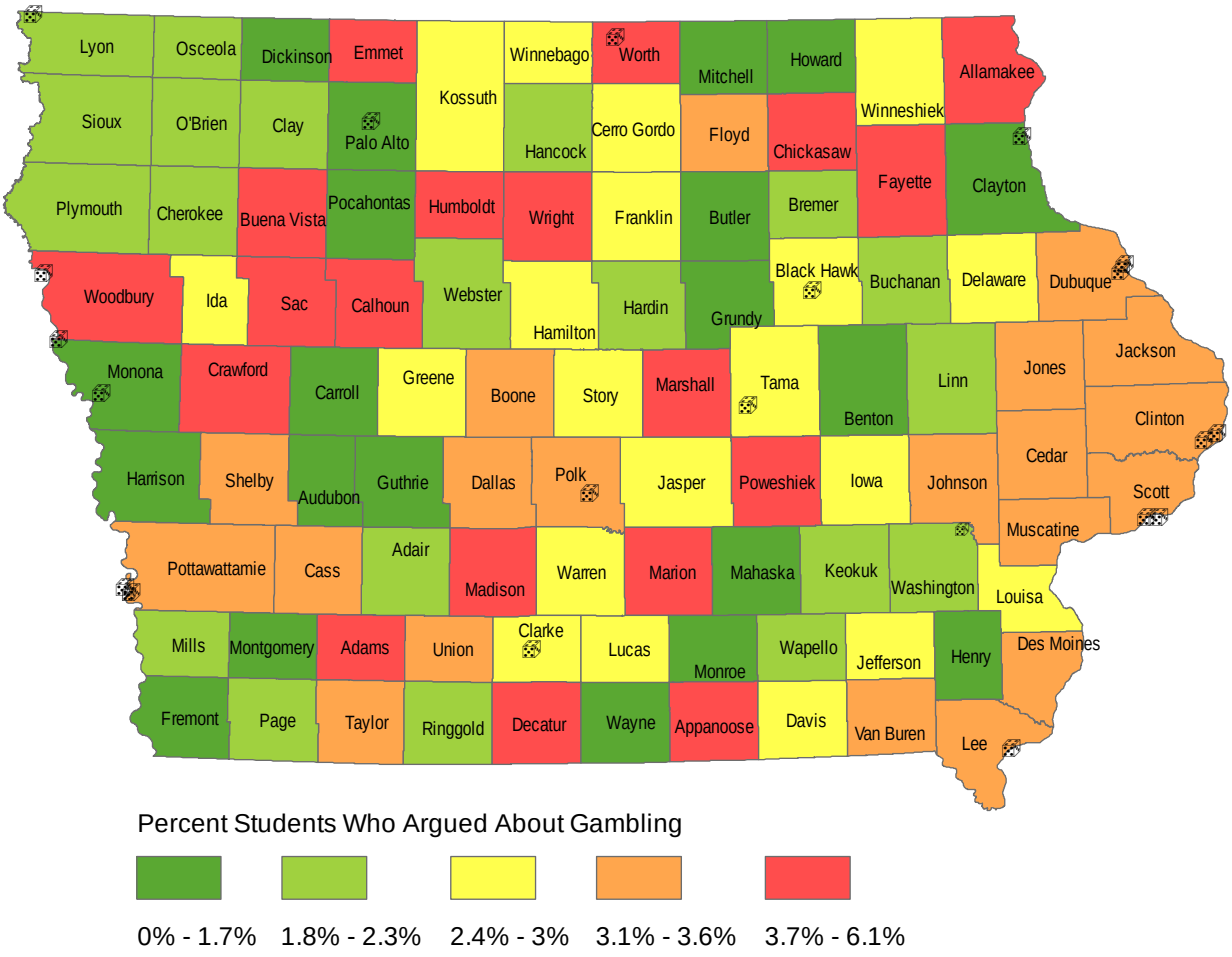
Figure 14: Percent Students Won/Lost Over $25 Gambling in a Day by Iowa County.



[17] *Mann-Whitney U-test, z = 1.34, p > 0.25*

Percentages of students who argued with family or friends are show in Figure 15. There was no evidence of a statistical association between having a casino and the county's percent of students who had gambling related arguments.[18]

Figure 15: Percent Students Argues Over Gambling by Iowa County.



Summary

While we did not perform more sophisticated GIS or spatial statistical analyses, simple analyses did not support the notion that casino location increased student gambling activities. That said, there were real differences with some counties having higher or lower levels of student gambling. There were also moderate correlations among the gambling measures considered on the county level. Thus, some counties tended to have consistently higher or lower youth gambling issues. For example, Monona County (with a casino) consistently has among the lowest levels of gambling, students who lost or won over $25, and least arguments. Mahaska, Montgomery, Pocahontas, Henry, and Palo Alto counties are also consistently low. Allamakee, Emmet, Adams, Marshall, Shelby, and Crawford are all consistently high on all gambling indices.

[18] *Mann-Whitney U-test, $z = 0.45$, $p > 0.65$*

Youth Gambling and Behavioral Health

Addressing our last question, "Is youth gambling related to other factors?" another set of analyses were conducted. Aside from the demographic associations discussed earlier, we investigated the degree to which exposure to gambling (ever gambled) related to other student behaviors. This was not an exhaustive search for correlates. Only a select few types of behavior were reviewed: Alcohol and other drugs; Depression symptoms and suicidal ideation.

Substance Use (Ever Used)

Ever having gambled was a risk factor for lifetime use of any alcohol or drugs. Table 2 shows alcohol behaviors, have you ever had alcohol, have you ever had 5 or more drinks of alcohol within a couple of hours (Binge). Ever using tobacco is also shown, as are any drug use, any marijuana use.

Table 2: Lifetime Substance Use

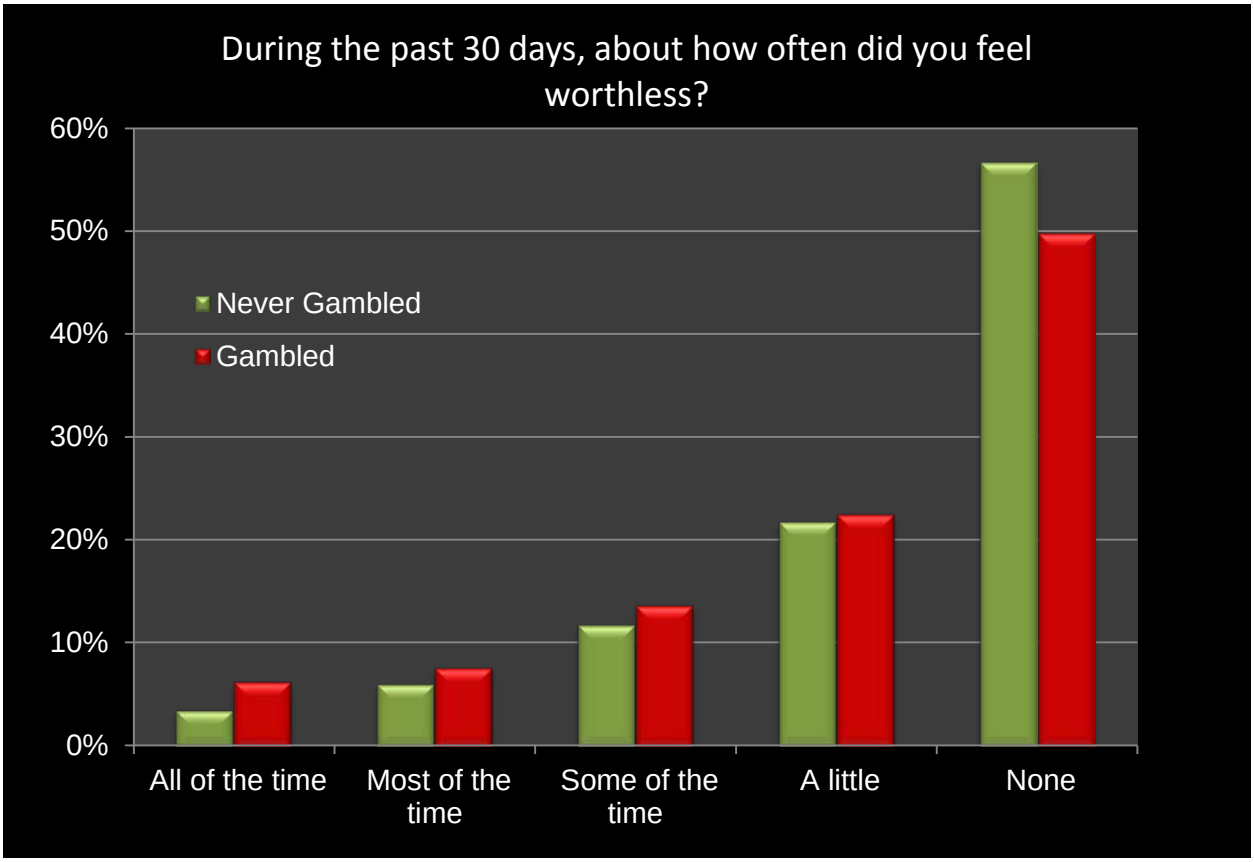
	Ever gambled?		
Lifetime use?	***No***	***Yes***	*Risk Difference*
Alcohol	*17.7%*	*38.9%*	*21.2%*
Binge Drink	*5.6%*	*14.5%*	*8.9%*
Tobacco	*8.7%*	*21.1%*	*12.4%*
Drugs	*13.9%*	*28.8%*	*14.9%*
Marijuana	*7.0%*	*15.7%*	*8.7%*

In all instances, ever having gambled was strongly associated with increased lifetime substance use. The student's age and sex might have caused these increases. For example, older male students, who are more likely to gamble, are also more likely to have ever had a drink of alcohol. Analyses that are more sophisticated were done to control for student grade and sex. In all of the cases, the effects of gambling remained significant and large. Furthermore, analyzing each grade level separately showed the same large increases.

Depression and Suicidal Thoughts

There was a small relationship between a student's feeling worthless ("During the past 30 days, about how often did you feel worthless?") and ever having gambled.[19] This is shown in Figure 16. Students who never gambled reported "None" more often than those who have gambled. Thus those students who have gambled experience more days of feeling worthless than those who have not gambled. This effect was slightly stronger once the student's sex and grade was considered.

Figure 16: Lifetime Exposure to Gambling and Number of Days Students Felt Worthless.

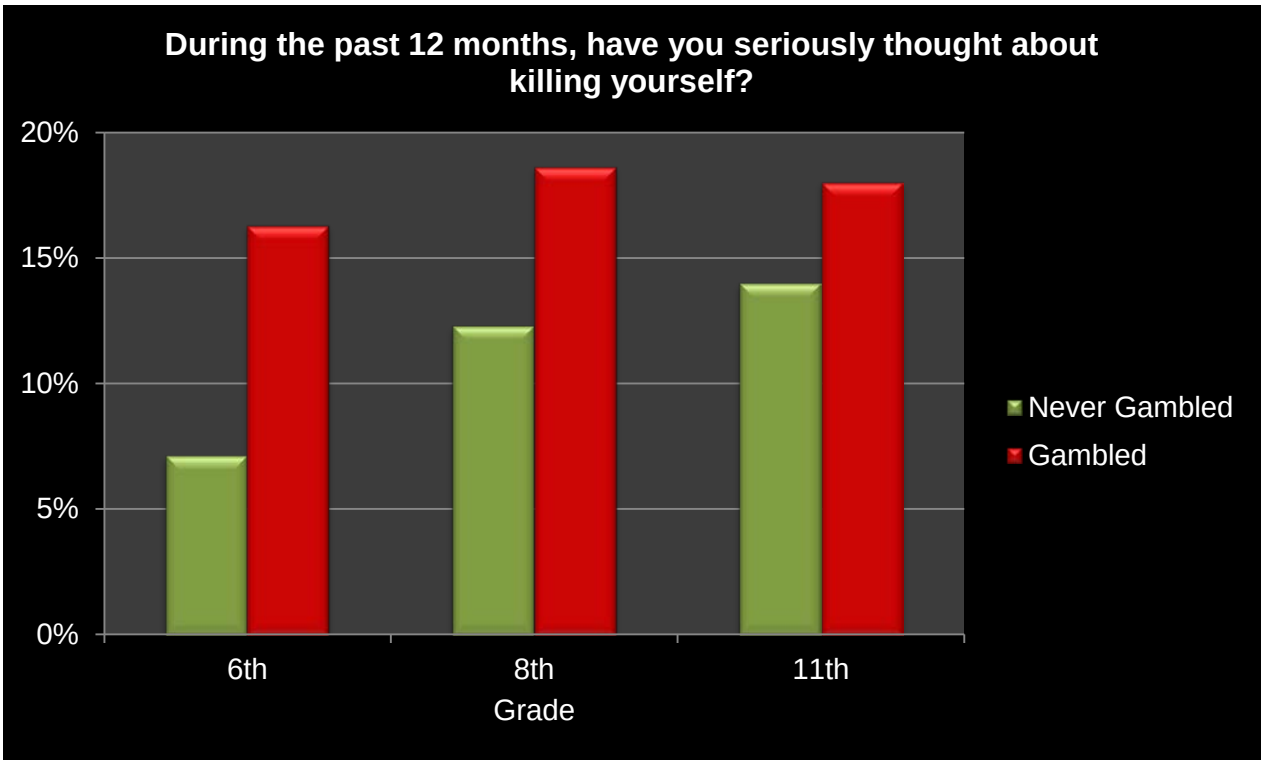


There was also a significant association between students ever having gambled and responding "Yes" to the question "During the past 12 months, did you ever feel so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities?" Of students who never gambled 14.6% responded "Yes", while 19.4% students who have gambled responded "Yes". Thus, feelings of worthlessness and severe sadness were slightly elevated among students who have gambled.

[19] *Mann-Whitney U test, $z = 18.523$, $p < 0.0001$*

While this effect on feelings of worthlessness was somewhat subtle, ever having gambled was a fairly strong risk factor for suicidal ideation, "During the past 12 months, have you seriously thought about killing yourself?"[20] This effect is apparent at each grade level but is significantly more pronounced in the younger grades.[21]

Figure 17: Lifetime Exposure to Gambling and Suicidal Ideation.



In more sophisticated analyses, the effects continued once the student's sex was statistically controlled.

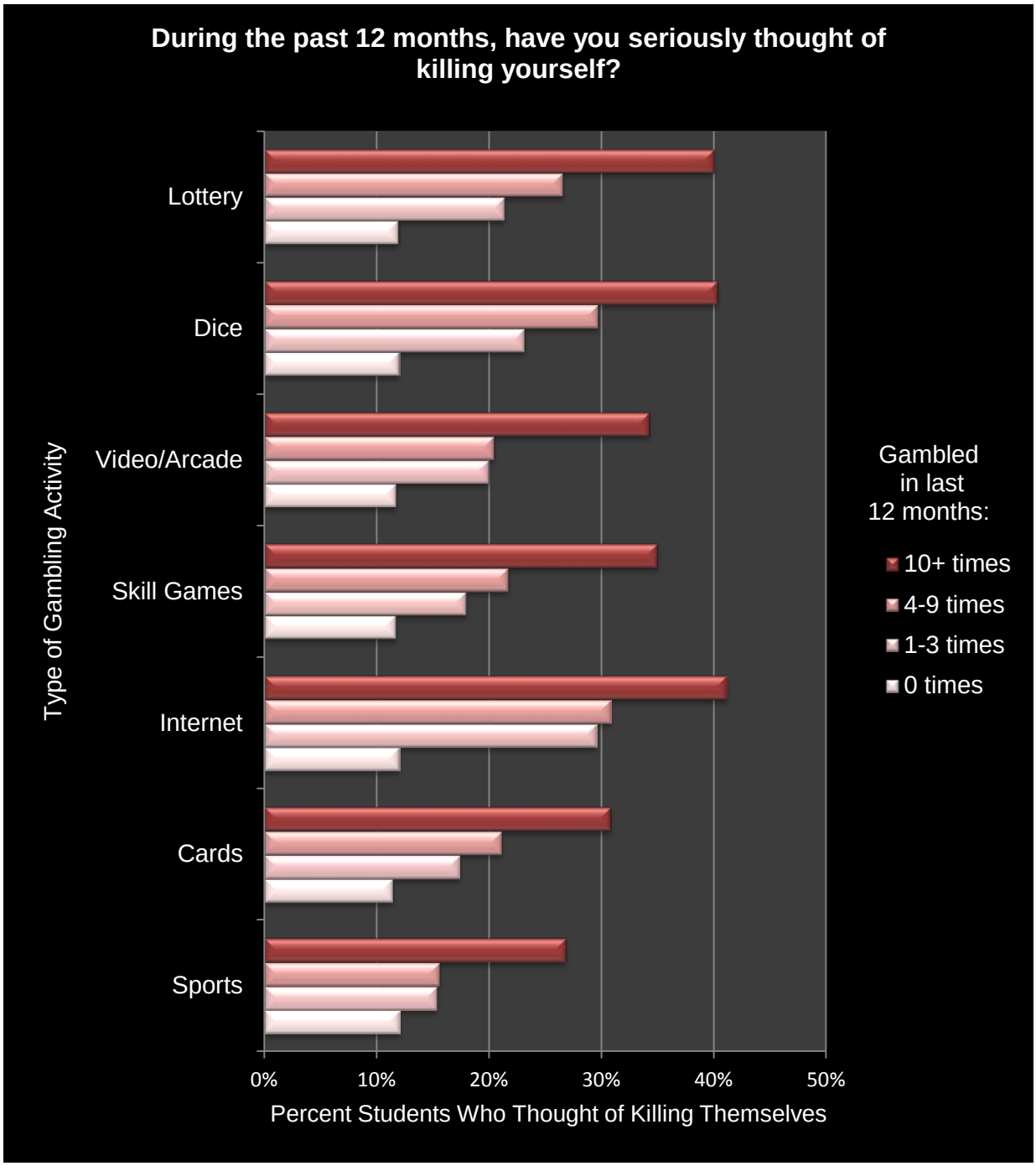
The previous analyses only considered gambling anytime in the student's lifetime. Older children will more likely experience some gambling just as a function of aging and maturation. The next set of analyses consider past 12-month gambling activities.

The frequency of gambling over the past 12 months was strongly related to the percentage of students who admitted seriously thinking of killing themselves. While this risk factor relationship was evident over all levels of gambling frequency (0 times to 9 times in the past year), the largest increase in suicidal ideation is obvious in the frequent gamblers (10 or more times in the past year; Figure 18).

[20] *Logistic regression, Wald* $\chi^2 = 546.07$, $df = 1$, $p < 0.0001$

[21] *Logistic regression, interaction Wald* $\chi^2 = 100.58$, $df = 1$, $p < 0.0001$

Figure 18: Suicidal Ideation and Gambling Frequency of Different Activities



Great care should be exercised in assuming any kind of causal connection between gambling behaviors and suicidal ideation. Many factors might affect the probability of both in the adolescent. For example, students with excessive impulsivity may tend to gamble and gamble more often, as well as seriously consider killing themselves. Similar responses may be reported by students with depression. Cognitive factors such as effective decision-making abilities and executive functions, developing in adolescents, may increase how attractive these behaviors and thoughts appear.