

# Iowa Youth Survey 2016: Problem Gambling Report

*THE IOWA CONSORTIUM FOR SUBSTANCE ABUSE RESEARCH AND EVALUATION*

**Problem Gambling Report  
July 2017**

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Iowa Department of Public Health,  
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Prevention





**Iowa Youth Survey 2016  
Problem Gambling Report  
Special Report**

**DeShauna Jones, PhD  
Program Evaluator**

Stephan Arndt, PhD  
Director

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## EXECUTIVE SUMMARY

**The following report addresses four questions on youth gambling behaviors using 2016 Iowa Youth Survey (IYS) data:**

- Who gambles among sixth, eighth, 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?
- Have youth gambling outcomes and other gambling-related factors changed from 2012 to 2016?

The analysis focuses on IYS questions that asked if the respondent ever gambled (lifetime gambling), ever 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 more than 84,000 sixth, eighth, and 11<sup>th</sup> graders.

### **Recommendations:**

- Prevention efforts should target young males before the eighth grade.
- Examine potential protective factors that contribute to females' less frequent gambling behaviors.
- 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 screening.
- Gambling interventions should incorporate multicultural considerations for race, ethnicity, and social class.
- Investigate the Iowa Gambling Exposure Scale (IGES ) as a simple screening tool for problematic gambling activity among youth.



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## 2016 IOWA YOUTH SURVEY

The 2016 Iowa Youth Survey (IYS) is the 16th in a series of surveys completed every two or three years since 1975. The survey is conducted with students in grades six, eight, and 11 attending Iowa public and private schools. In this administration, 84,703 validated records were received from September 26, 2016, through November 18, 2016. 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 277 of Iowa's 332 public school districts (83 percent), and from 12 of the 82 non-public schools (15 percent) for students enrolled in grades six, eight, or 11. These records may represent additional districts (e.g., when districts whole grade share, when multiple districts reported the same district number, when districts shared their unique SurveyMonkey URLs, etc.). The 84,703 validated records received from students completing the IYS represented all 99 counties in Iowa. All Iowa counties were represented by a minimum of 26 IYS records.

The Gambling Section of the IYS includes one skip question (i.e., "Have you ever bet or gambled for money or possessions?"). If a student answers "no" to the skip question, the nine subsequent questions related to gambling are passed over and the survey advances past the gambling questions. Overall, 20,406 (25.1 percent) of the 81,309 students who responded to this question said that they had ever gambled.

Roughly, equal numbers of sixth, eighth, and 11<sup>th</sup> graders were included as were roughly equal numbers of male and female students. These counts are shown in Table 1.

**Table 1: Number of Validated 2016 Iowa Youth Survey Records**

Grade	Male	Female	Total <sup>1</sup>
6th	14,776	14,211	29,275
8th	14,780	14,090	29,139
11th	13,130	12,651	25,981
<b>Total<sup>1</sup></b>	<b>42,686</b>	<b>40,952</b>	<b>84,703</b>

\*Note: Row/column totals do not add up since they include those with missing grade or sex responses.



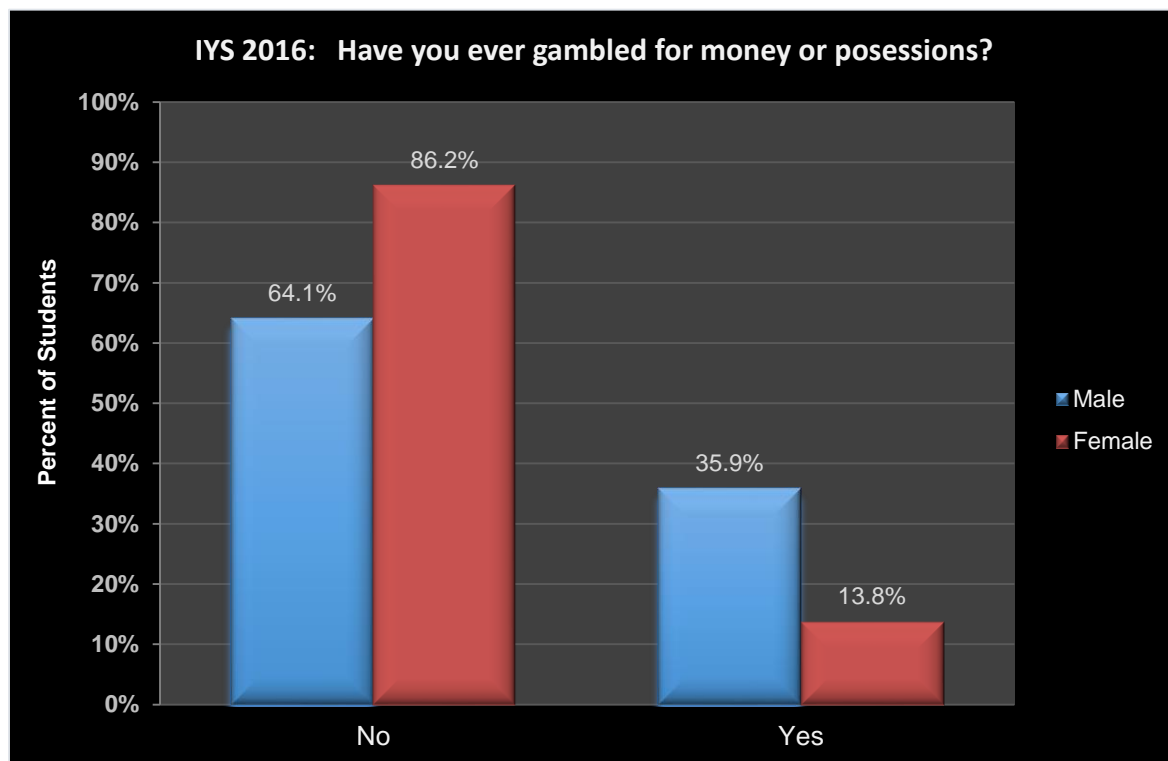
## WHO GAMBLES AMONG 6<sup>TH</sup>, 8<sup>TH</sup>, AND 11<sup>TH</sup> GRADERS IN IOWA?

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

### Grade and Sex of Students

For all students, males are more than two times more likely to demonstrate lifetime gambling than females (35.9 percent vs. 13.8 percent).<sup>1</sup> Figure 1 shows this difference in the percent of males and females who have ever gambled in their lifetime. From all students who took the 2016 IYS, 24.1 percent (20,406 students) reported gambling at least once.

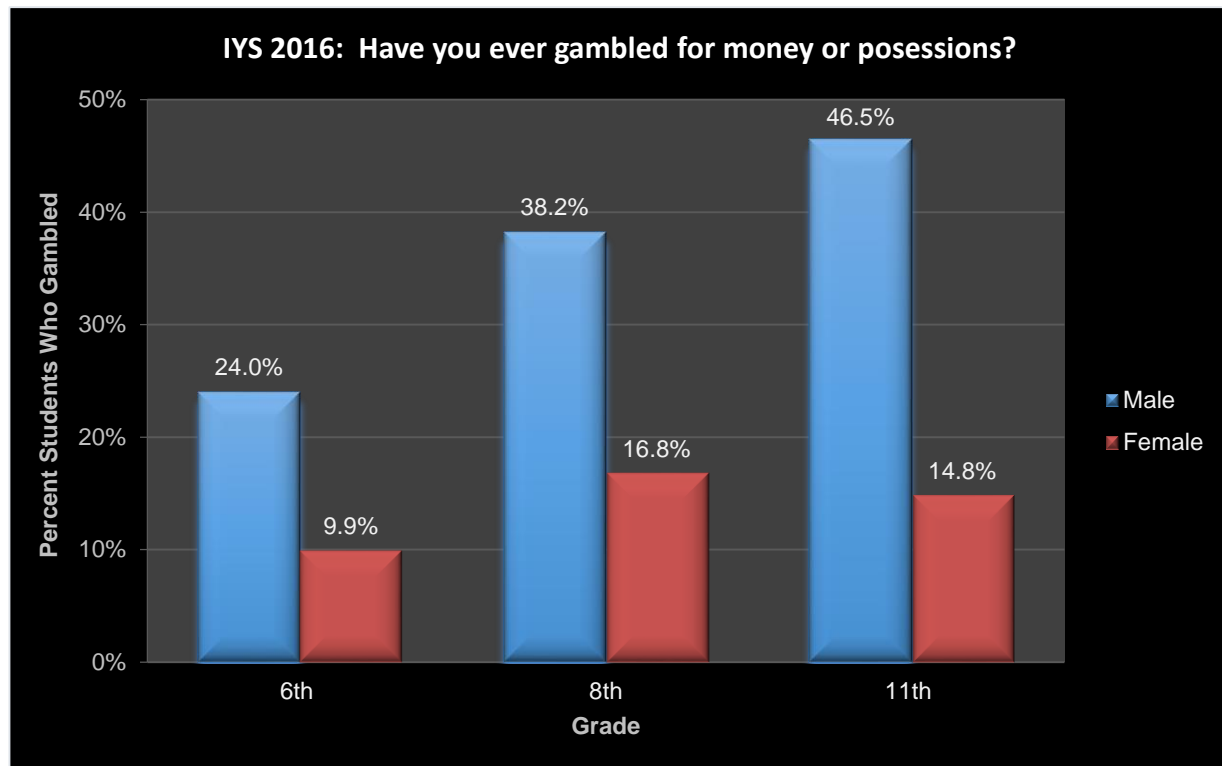
**Figure 1: Percent of Students Who Have Gambled or Not Gambled by Sex**



<sup>1</sup> Logistic regression: Wald  $\chi^2 = 4952.84$ ,  $df = 1$ ,  $p < 0.0001$

There are differences between students who reported they gambled when viewed by grade level. When viewed by grade, 17.2 percent of sixth graders, 27.7 percent of eighth graders and 30.9 percent of 11<sup>th</sup> graders reported ever gambling. These percentages demonstrate a marked increase in gambling between the sixth and eighth grade, which is maintained through the 11<sup>th</sup> grade. The trends differed for males and females with males largely driving the overall increases.<sup>2</sup> Figure 2 demonstrates the effect of sex and grade for those who have gambled.

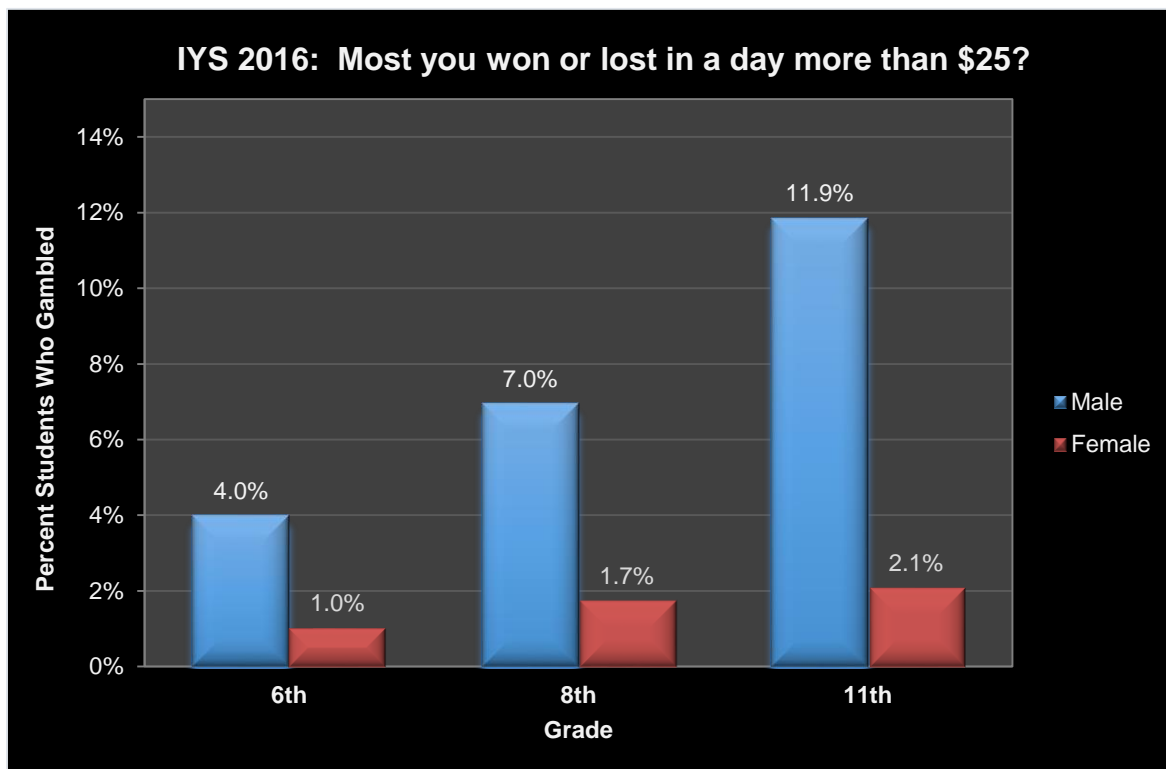
**Figure 2: Percent of Students Who Have Gambled by Sex and Grade**



<sup>2</sup> Logistic regression: Interaction Wald  $\chi^2 = 185.64$ ,  $df = 2$ ,  $p < 0.0001$

The amount of money lost by students who gamble is an outcome variable that may indicate potentially problematic gambling behavior. Figure 3 demonstrates the effect of sex and grade on those losing or winning more than \$25 in one day. Depending on gender, winning or losing more than \$25 in one day while gambling shows a differential change in percentage across grade.<sup>3</sup> While females are not increasing their likelihood of losing or winning more than \$25 in a day over grades, males show a larger increase from eighth to 11<sup>th</sup> grade (OR = 1.51 95% CI = 1.24, 1.84). There is not a significant difference in the likelihood of losing or winning more than \$25 between males in sixth and 8<sup>th</sup> grade.

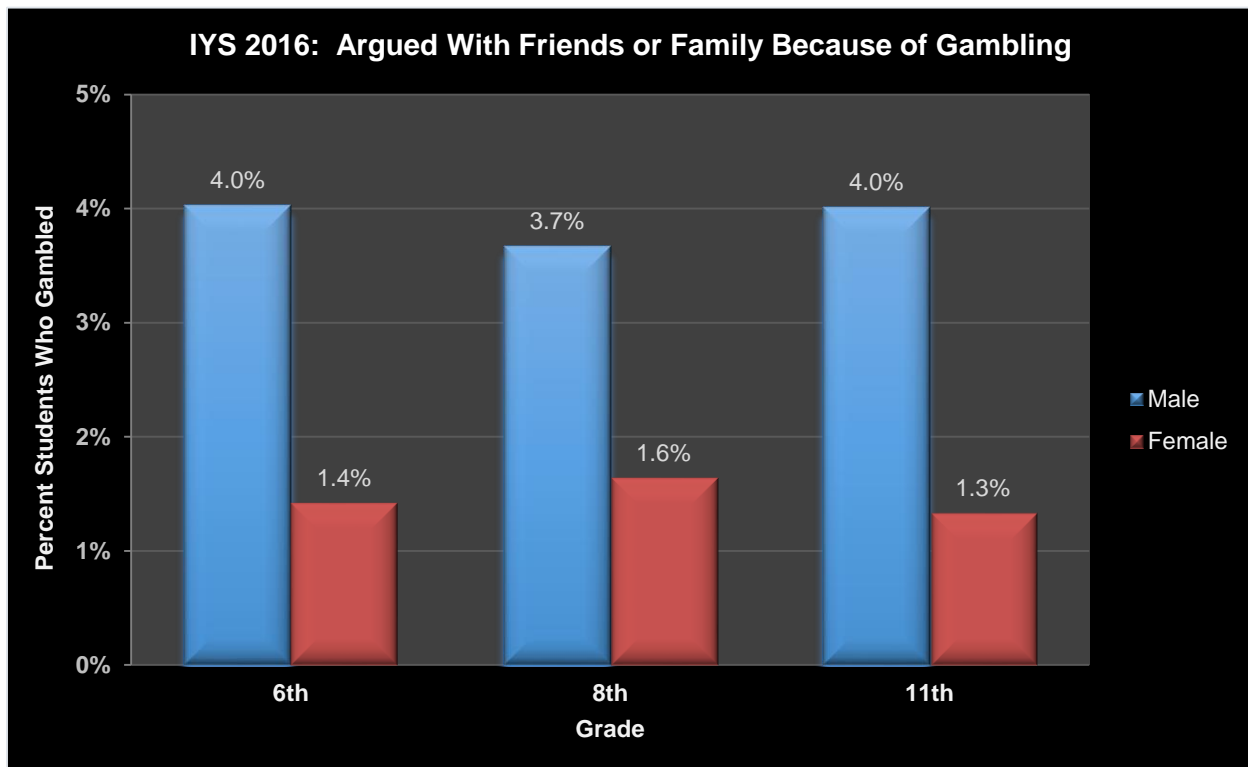
**Figure 3: Percent of Students Who Have Won or Lost More than \$25 in One Day by Sex and Grade**



<sup>3</sup> Logistic regression: Interaction Wald  $\chi^2 = 22.62$ ,  $df = 2$ ,  $p < 0.0001$

An argument with friends or family is another important outcome variable that may indicate potentially problematic gambling behavior. Figure 4 demonstrates the association sex and grade have with arguing as a result of gambling. Arguments with family and friends do differ between males and females with males being more than twice as likely to have an argument (3.9 percent vs. 1.5 percent).<sup>4</sup> However, the likelihood of having an argument with family or friends does not significantly differ across grades. Approximately 3.0 percent of students in each grade reported arguing with family or friends because of gambling.

**Figure 4: Percent of Students Who Argued with Family or Friends Because of Gambling by Sex and Grade**



<sup>4</sup> Logistic regression:  $Wald \chi^2 = 422.40, df = 1, p < 0.0001$

## Student Race, Ethnicity, and Living Arrangements

### Race/Ethnicity

There were significant differences among students' racial/ethnic groups who reported lifetime gambling.<sup>5</sup> After controlling for the effects of grade and sex, the effect of race on lifetime gambling increased slightly.<sup>6</sup> Figure 5 shows the different percentages for each of the racial/ethnic groups. Asian students had the least lifetime exposure (21.5 percent); students of all other racial/ethnic groups reported significantly higher rates of lifetime gambling than Asian students. White (24.3 percent) students reported the least lifetime exposure after Asians. Multi-racial students (29.8 percent), Native American students (28.5 percent) and students reporting an "other" racial/ethnic group (28.4 percent) had the highest percentages.

**Figure 5: Percent of Students Who Have Ever Gambled by Race/Ethnicity**

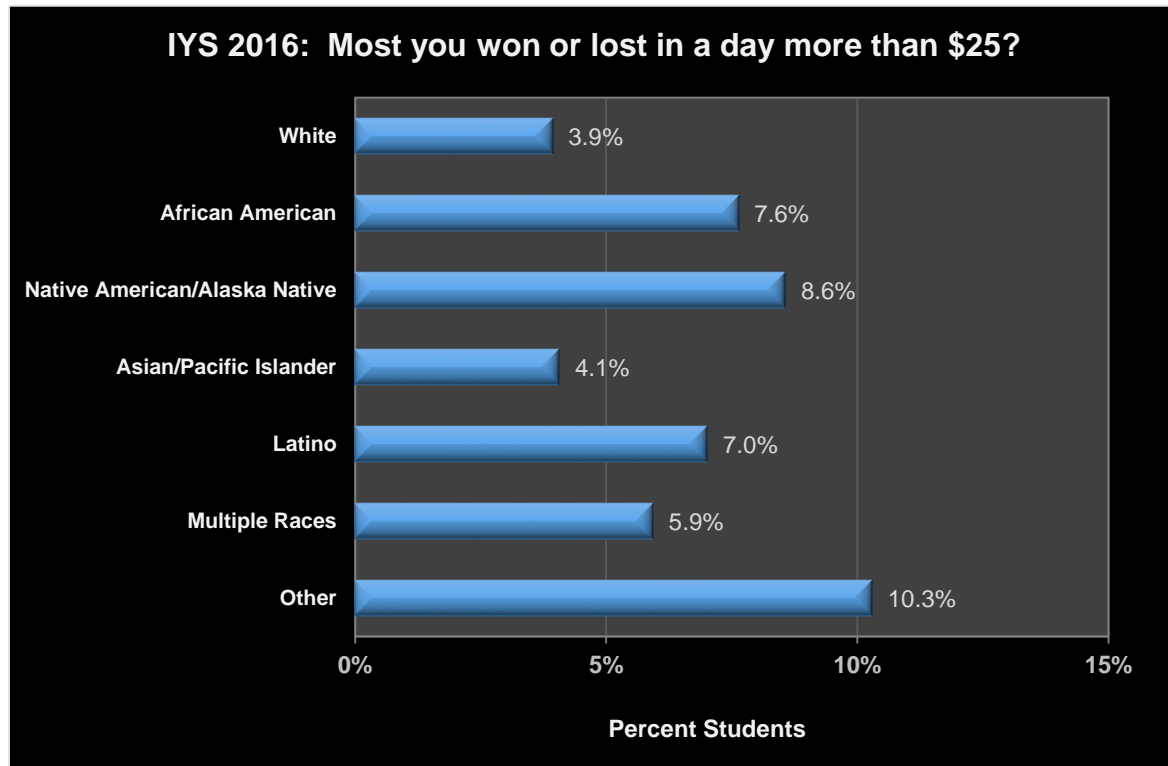


<sup>5</sup> Logistic regression:  $Wald \chi^2 = 166.46, df = 6, p < 0.0001$

<sup>6</sup> Logistic regression:  $Wald \chi^2 = 224.80, df = 6, p < 0.0001$

There were also significant racial/ethnic differences in reporting winning or losing more than \$25 in one day<sup>7</sup>. The effect of race on winning or losing more than \$25 in one day increased slightly after controlling for grade and gender.<sup>8</sup> Figure 6 shows the percent of students reporting winning or losing more than \$25 in one day by students' race/ethnicity. Of those who reported gambling, approximately 4 percent of White and Asian students reported winning or losing more than \$25, while all other racial/ethnic groups ranged between 5.9 percent and 10.3 percent.

**Figure 6: Percent of Students Who Have Won or Lost \$25 by Race/Ethnicity**



Reporting arguments with family or friends due to gambling also significantly varied by students' race/ethnicity.<sup>9</sup> White (2.2 percent) and Asian (2.7 percent) students reported arguing with family or friends about gambling less than students of an "other" racial/ethnic group (7.2 percent) and African Americans (5.9 percent).

<sup>7</sup> Logistic regression: Wald  $\chi^2 = 332.95$ ,  $df=6$ ,  $p<0.0001$

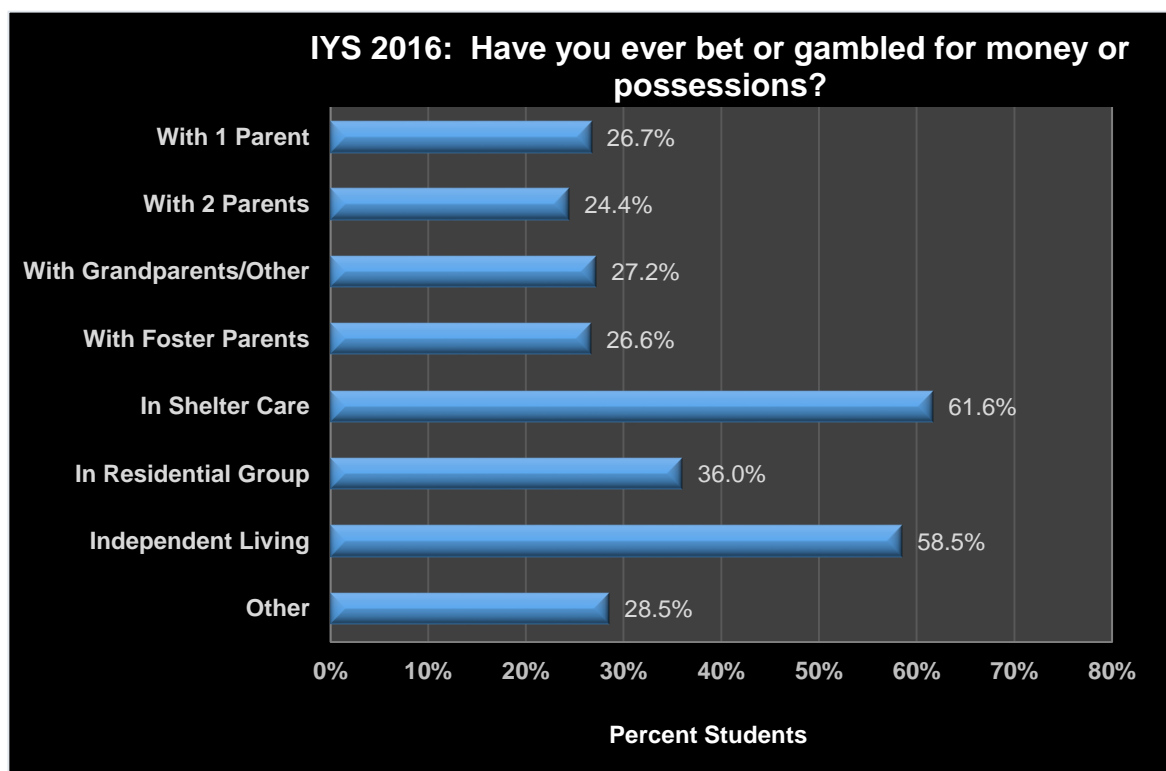
<sup>8</sup> Logistic regression: Wald  $\chi^2 = 367.40$ ,  $df=6$ ,  $p<0.0001$

<sup>9</sup> Logistic regression: Wald  $\chi^2 = 315.68$ ,  $df=6$ ,  $p<0.0001$

## Living Arrangements

Students' living arrangement also had a statistically significant relationship with the likelihood of lifetime gambling.<sup>10</sup> After controlling for grade and sex, the effect of living situation on lifetime gambling decreased slightly.<sup>11</sup> Living arrangement percentages are shown in Figure 7. The two groups with the greatest percentage of gambling activity are those living in shelter care (61.6 percent) and in independent living (58.5 percent). These were significantly different from all other groups. Students living with two parents were significantly less likely to report gambling than all students in all other types of living arrangements, with the exception of students living with foster parents.

**Figure 7: Percent of Students Who Have Ever Gambled by Living Situation**



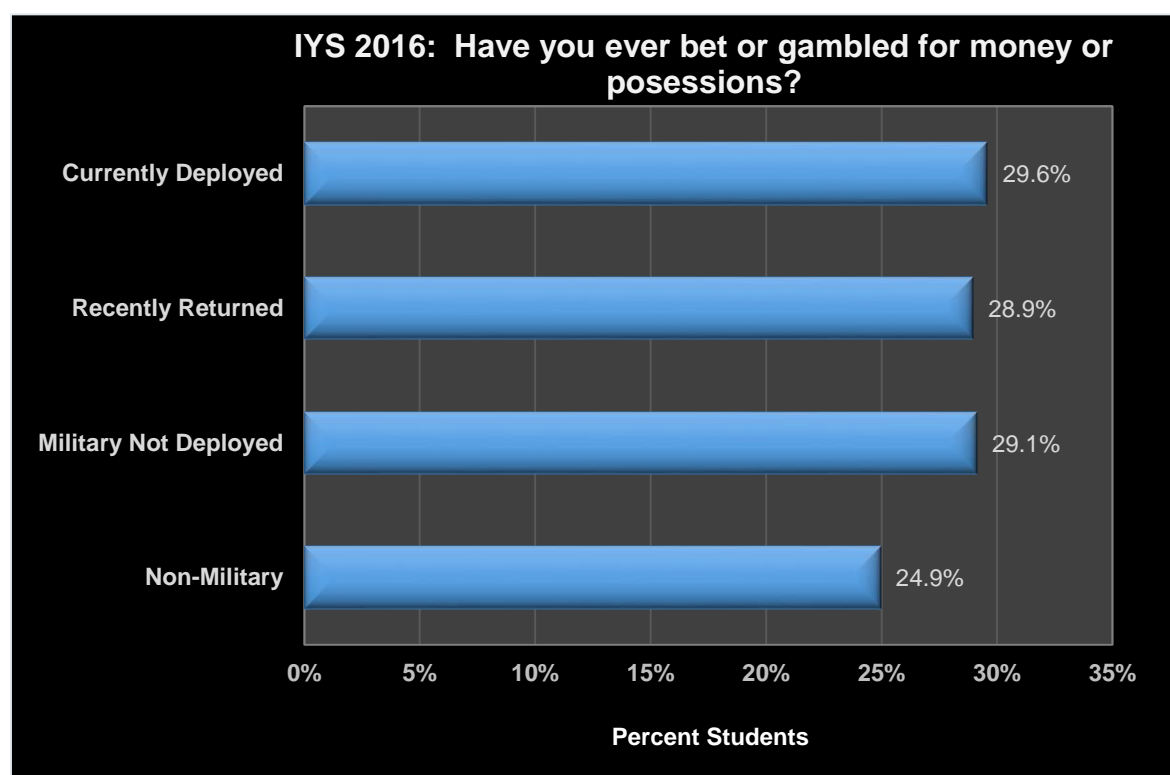
<sup>10</sup> Logistic regression:  $Wald \chi^2 = 174.96$ ,  $df = 7$ ,  $p < 0.0001$

<sup>11</sup> Logistic regression:  $Wald \chi^2 = 155.87$ ,  $df = 7$ ,  $p < 0.0001$

## Students in Military Families

Students in military families demonstrated a relatively small, but significant difference in lifetime gambling.<sup>12</sup> After controlling for grade and sex, the effect of living in a military family did not change substantially.<sup>13</sup> This suggests that grade and sex do not affect the likelihood of lifetime gambling when comparing military families. Figure 8 shows the association between living in a military family and gambling. Students from non-military families demonstrated the lowest percentage of lifetime gambling (24.9 percent). Students with at least one parent in the military were separated into three subgroups demonstrating varying levels of lifetime gambling. Approximately 30 percent of students in military families reported ever gambling regardless of whether or not one parent was currently deployed (29.6 percent), recently deployed (28.9 percent) or was never deployed (29.1 percent).

**Figure 8: Percent of Students Who Have Ever Gambled by Military Family**



<sup>12</sup> Logistic regression: Wald  $\chi^2 = 29.15$ ,  $df = 1$ ,  $p < 0.0001$

<sup>13</sup> Logistic regression: Wald  $\chi^2 = 26.36$ ,  $df = 1$ ,  $p < 0.0001$

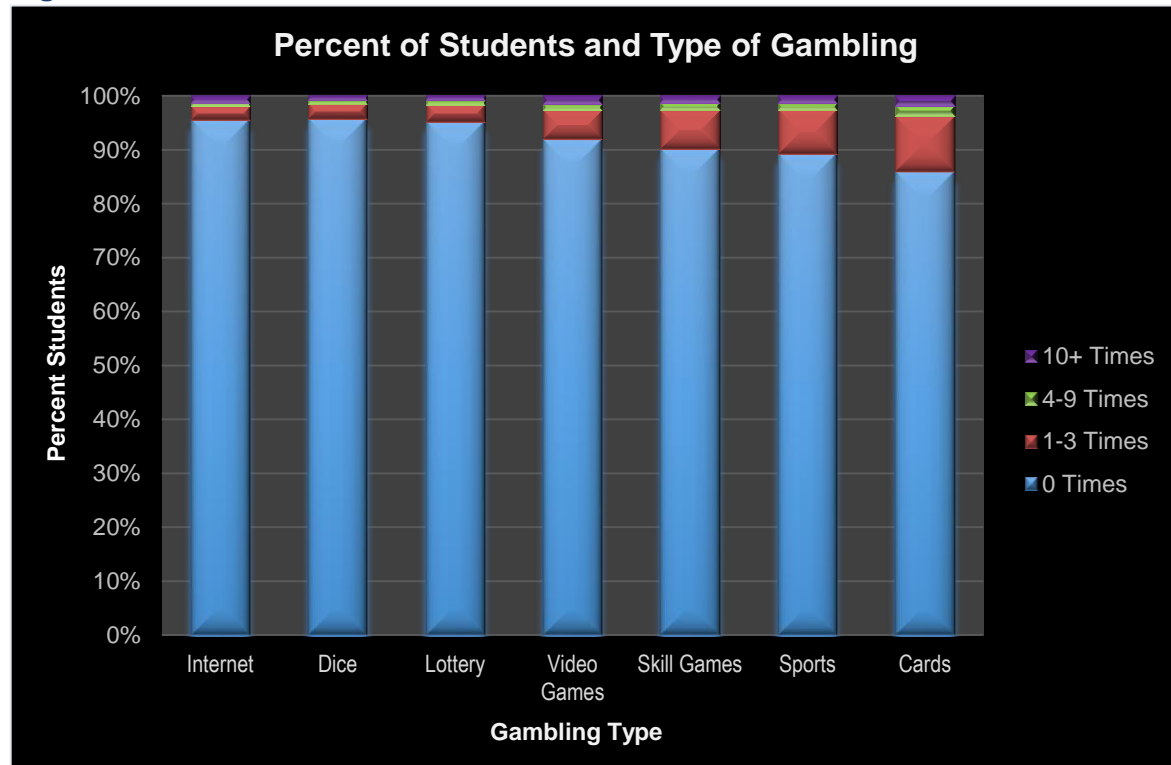
## TYPE OF GAMBLING PATTERNS

The IYS asks students about the type and frequency of gambling they have engaged in during the last 12 months. The question asks: "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?

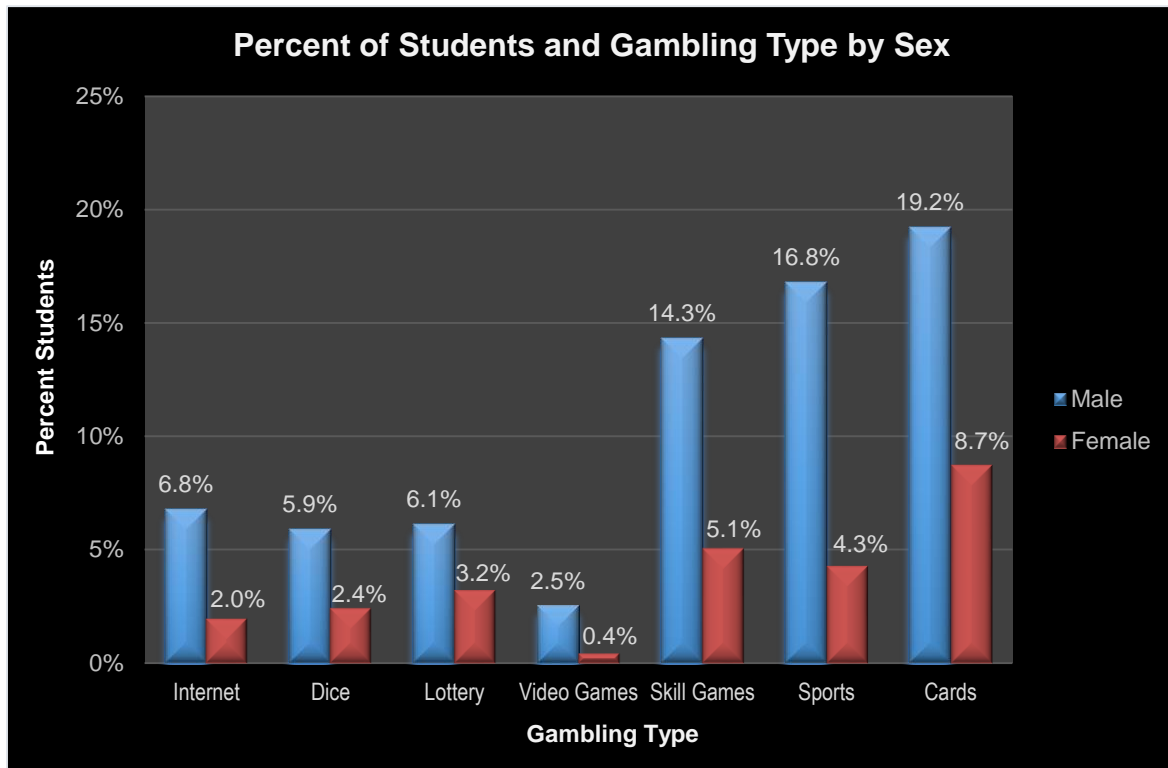
Figure 9 shows the types of gambling ordered from least often mentioned to most often mentioned. The most common gambling activity involves cards with friends or family, with 14.1 percent students gambling at least once in the last year in this activity. This is followed by sports (10.7 percent), skill games (9.8 percent) and video games (8.1 percent). Types of gambling that tended to have a lower percentage of student involvement are lottery (4.7 percent), dice (4.2 percent), and internet (4.4 percent).

**Figure 9: Percent of Students Who Gambled Within the Last Year at Various Games**



Males and females differed on whether or not they gambled at least once during the past 12 months on all types of activities.<sup>14</sup> The largest differences between males and females were apparent with the more common activities, including sports, cards and skill games as shown in Figure 10.

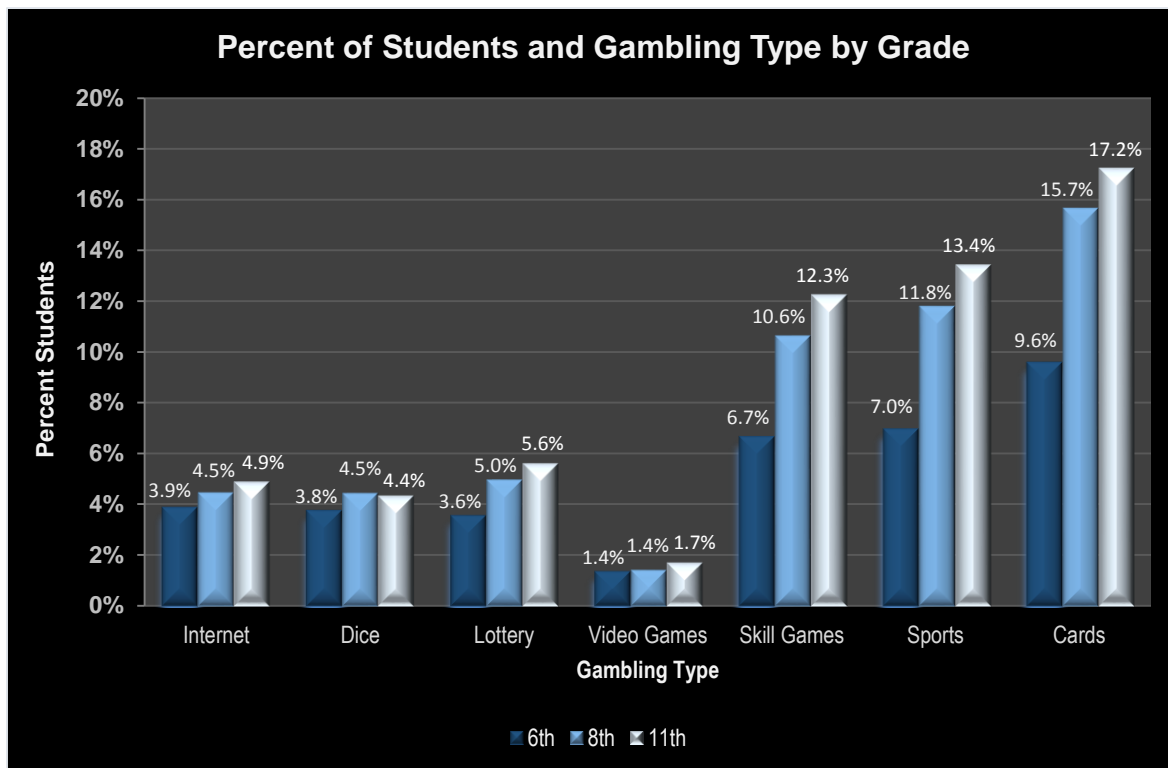
**Figure 10: Percentages of Students Who Gambled at Least Once Within the Last Year in Various Activities**



<sup>14</sup>  $\chi^2 = 4352.06$ ,  $df = 1$ ,  $p < 0.0001$

There were interesting patterns of differences across grade levels as seen in Figure 11.<sup>15</sup> Among the most frequent types of gambling (i.e., cards, sports and skill games), the eighth and 11<sup>th</sup> grade percentages are consistently similar, while there are sizeable gaps between sixth and eighth grade percentages. For these activities, it again appears that the largest increase in gambling behaviors occurs between the sixth and eighth grade. Grade differences are less pronounced, and in some cases are not present, in the less frequently reported gambling activities such as video games, dice and internet.

**Figure 11: Percentages of Students at Each Grade Level Who Gambled at Least Once Within the Last Year in Various Activities**

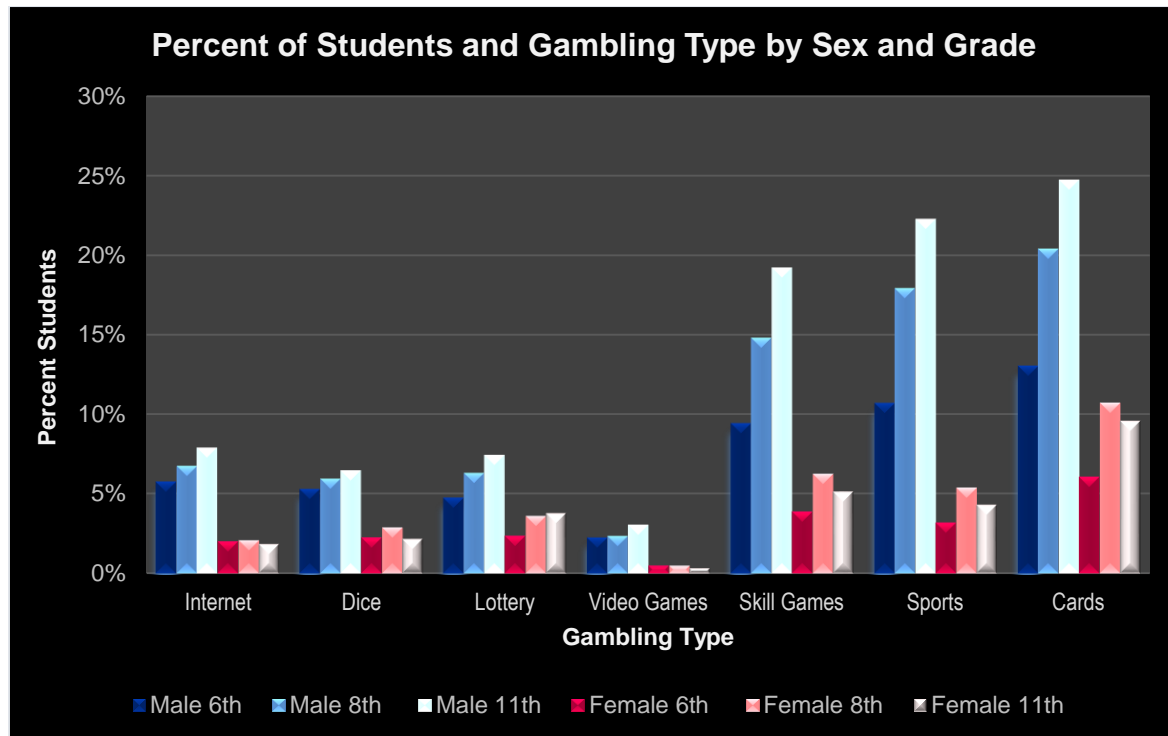


<sup>15</sup>  $\chi^2 = 1235.7$ ,  $df = 2$ ,  $p < 0.0001$



Figure 12 displays how the type of gambling differs between sex and grade of students. Males demonstrate a consistently higher percentage of gambling across grades and a clear preference for skill games, sports and card games. Among females, peaks in gambling occur in eighth grade and then decline in 11<sup>th</sup> grade. This pattern among female students suggests that while both eighth grade males and females report more frequent gambling than their sixth grade counterparts, 11<sup>th</sup> grade females do not report increased participation in gambling activities at the same rate as males.

**Figure 12: Percentage of Students Who Gambled at Least Once by Activity, Sex and Grade**



## Frequent Gambling Patterns

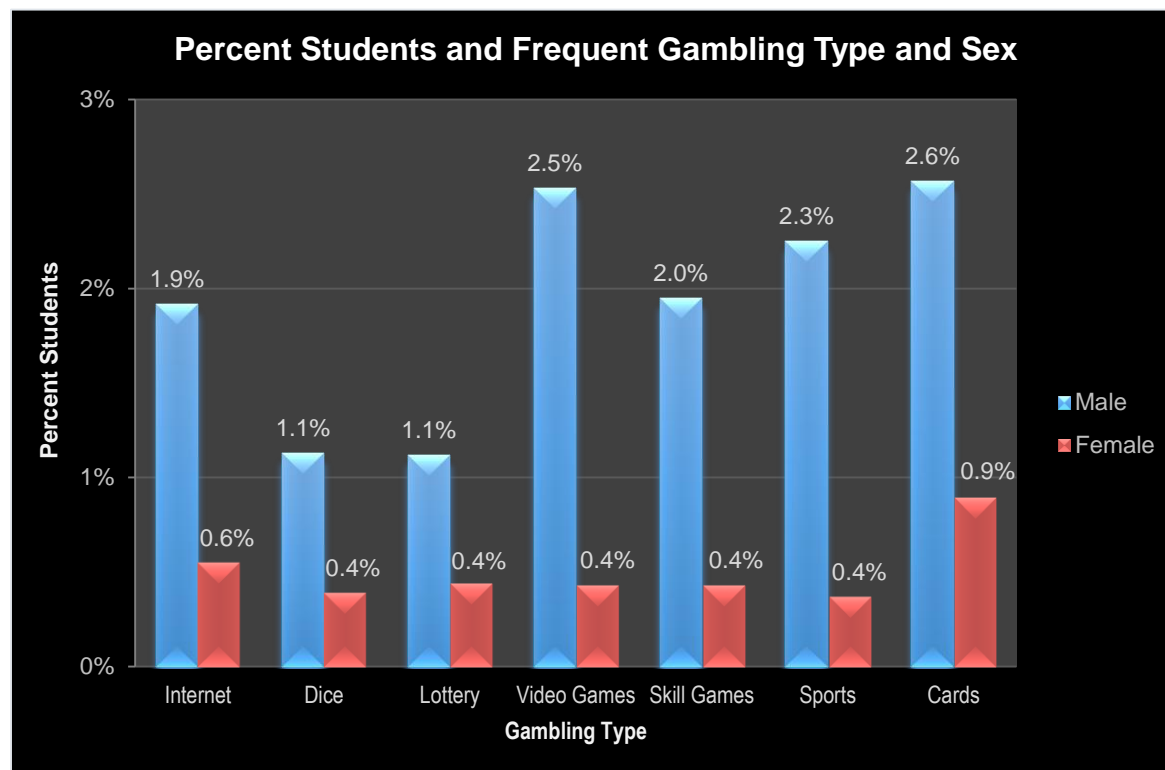
Frequent gambling, defined as 10 or more times in a year for an activity, is relatively uncommon for all groups. Fewer than two in 100 students reported frequently participating in any gambling activity. The most likely gambling activity students reported frequently participating in was playing cards with friends or family members (1.8 percent) followed by sports (1.3 percent). Frequent dice and lottery gambling is relatively rare, both with less than 1 percent.

Frequent gambling is strongly related to potential gambling problems. Students who frequently gamble on one or more activities are:

- Nearly 17 times more likely to argue with family or friends about their gambling.<sup>16</sup>
- More than 26 times more likely to have won or lost over \$25 in one day.<sup>17</sup>

Percent of frequent gambling activities, separated for males and females, appear in Figure 13. Males are much more likely to demonstrate a high frequency of gambling. Female frequent gambling is well below 1 percent in every gambling type and only nears 1 percent in card games (0.9 percent). Males gamble more than twice as much<sup>18</sup> as females on video games (2.5 percent vs. 0.4 percent), skill games (2.0 percent vs. 0.4 percent), sports (2.3 percent vs. 0.4 percent) and cards (2.6 percent vs. 0.9 percent).

**Figure 13: Percentage of Students Who Frequently Gambled Broken Down by Activity and Sex**



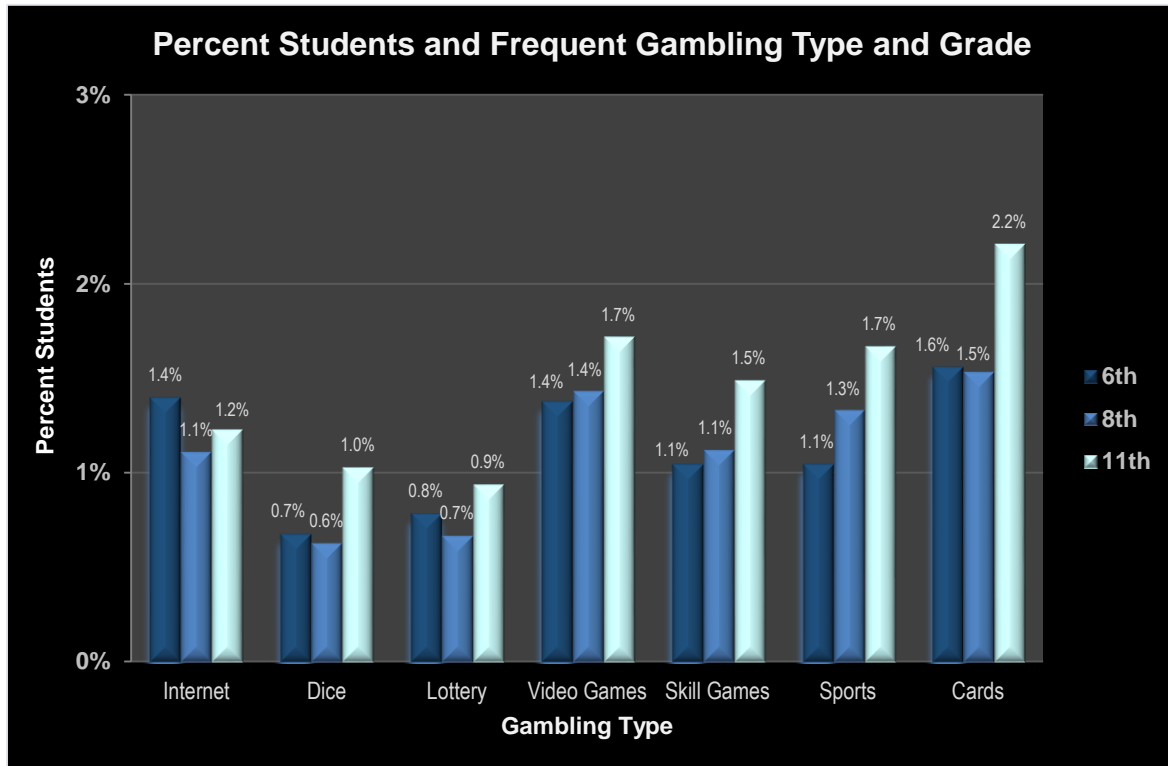
<sup>16</sup> Odds ratio = 16.995, Wald  $\chi^2 = 3376.02$ ,  $df = 1$ ,  $p < 0.0001$

<sup>17</sup> Odds ratio = 26.336, Wald  $\chi^2 = 6408.12$ ,  $df = 1$ ,  $p < 0.0001$

<sup>18</sup> When interpreting "twice as much," it is important to note these are very low percentages.

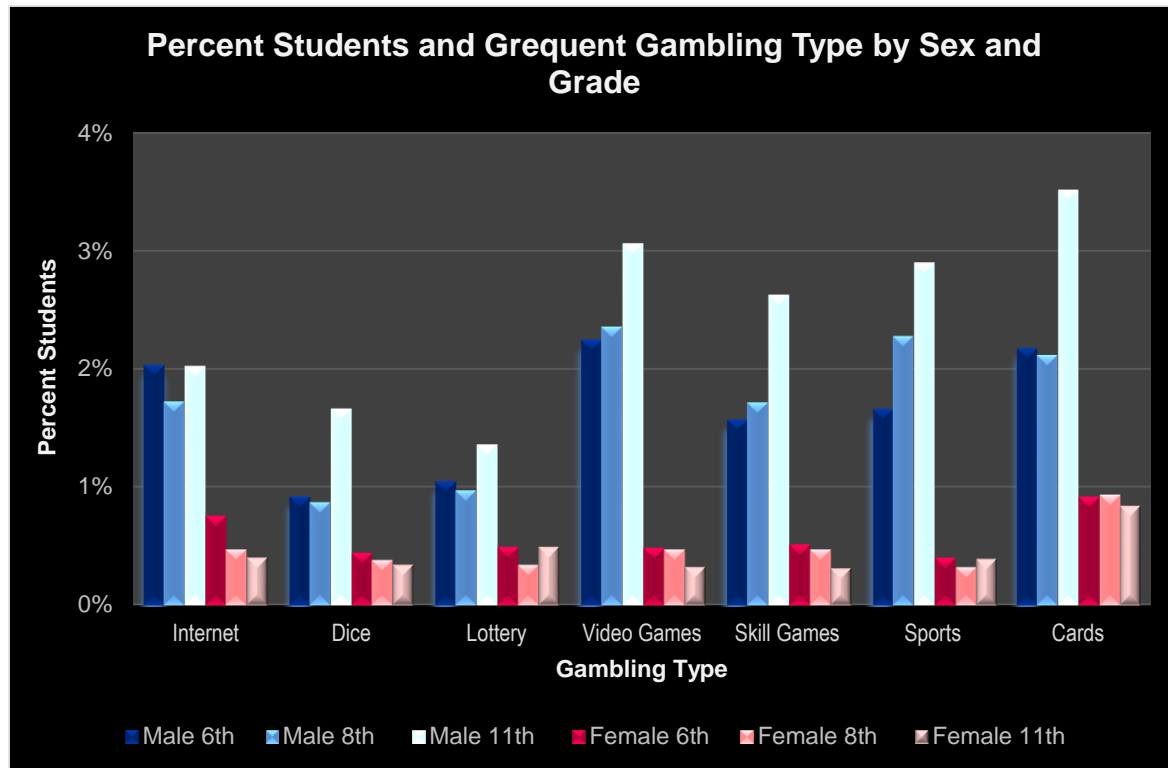
For most activities, frequent gambling increases with advancing grades as shown in Figure 14. The exceptions were frequent internet, dice and lottery gambling activities.

**Figure 14: Percentage of Students Who Frequently Gambled Broken Down by Activity and Grade**



The increasing percentages across grades are most noticeable among male students as displayed in Figure 15. Patterns are less consistent among females, with those in earlier grades reporting frequent gambling more often than females in older grades for cards, skill games, video games, dice and internet gambling.

**Figure 15: Percentage of Students Who Frequently Gambled Broken by Activity, Sex and Grade**



## ***Summary***

The most frequently reported types of gambling include cards, sports, skill games and video games. Gambling using the lottery, dice and the internet were less common. The largest gender and grade differences in types of gambling are seen in the most common types of gambling (i.e., cards, sports, skill games and video games). Female students and students in younger grades reported participating in these gambling types less often than males and students in older grades. For males, popular gambling types tend to show a dramatic percent increase going from sixth to eighth and eighth to 11<sup>th</sup> grades. However, this is not true for females. Rather, females show a sizeable increase between sixth and eighth grades and a slight decrease in gambling between eighth and 11<sup>th</sup> grades. Frequent gambling also increases with each surveyed grade, but mostly for males. Dice and lottery gambling were infrequent for males and females showing little increase with older students.

## COUNTY GAMBLING RATES, RANKABILITY, AND G.I.S. MAPPING

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

- Lifetime gambling/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.

### ***County Rankability***

Differences among counties are affected by chance variation to some extent. Analyses were conducted to estimate the reliability of the county estimates, i.e., how much of the differences in the county maps might be due to chance.<sup>19</sup> Based on our rankability analysis, the differences among counties were significantly and moderately based on real differences among counties. This means that county gambling differences are rankable. For the "ever gambled" question, approximately 70.8 percent of the variability between counties represents "actual" differences. The reliabilities of county differences for the other questions were slightly less than that. This also suggests that much of the county differences present random error, which would be expected to vary from time to time by chance. This also suggests that a substantial amount of the observed differences among the counties represents random unexplained variation. At the time of this report, 15 Iowa counties contained casinos. Of the three maps, the first regarding students' lifetime gambling is the most reliable. Each map breaks the counties into roughly five equal groups of counties, with darker colors marking the top highest percentages. Casino locations are also indicated on the maps.

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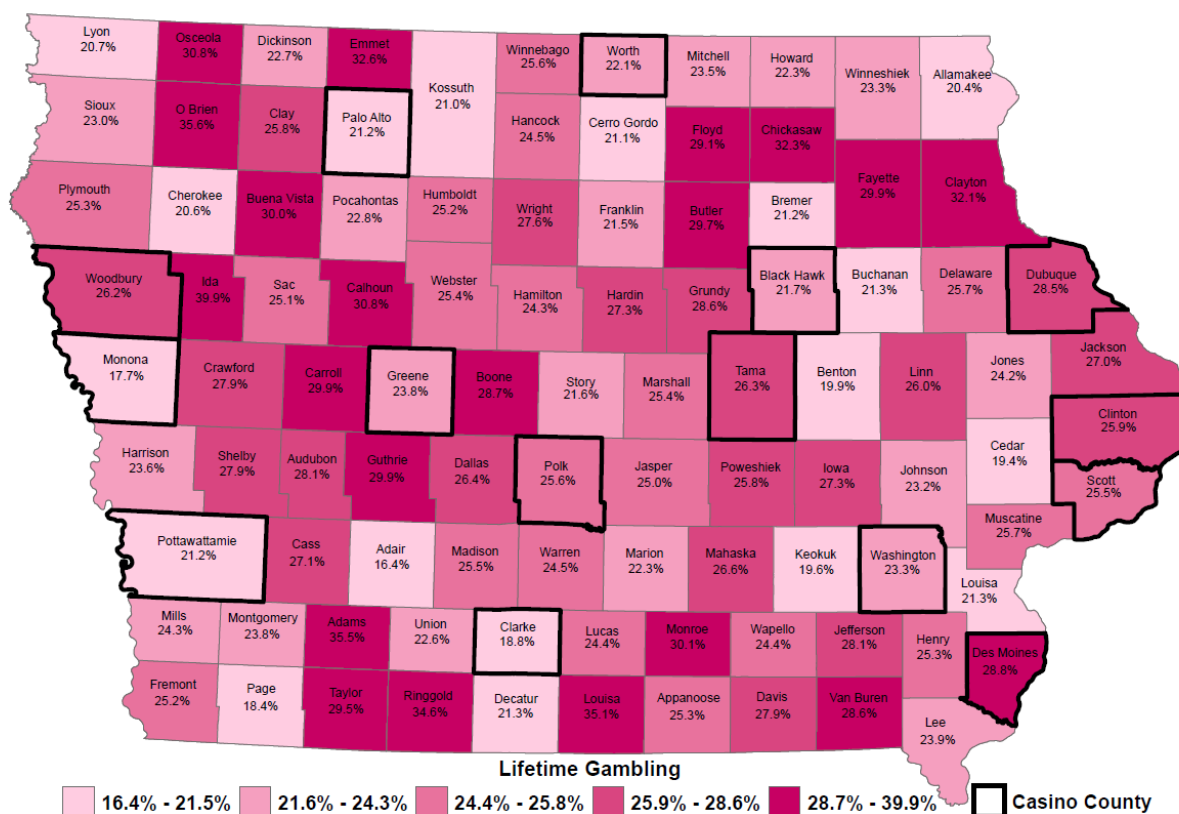
<sup>19</sup> Arndt, S., Acion, L., Caspers, K. & Diallo, O. Assessing community variation and randomness in public health indicators. *Population Health Metrics*. 9, 3 (2011).



## County Maps

The county map reflecting responses for IYS question B53, "Have you ever bet or gambled for money or possessions?" appears as Figure 16.

**Figure 16: Percent of Students Who Ever Gambled by Iowa County**

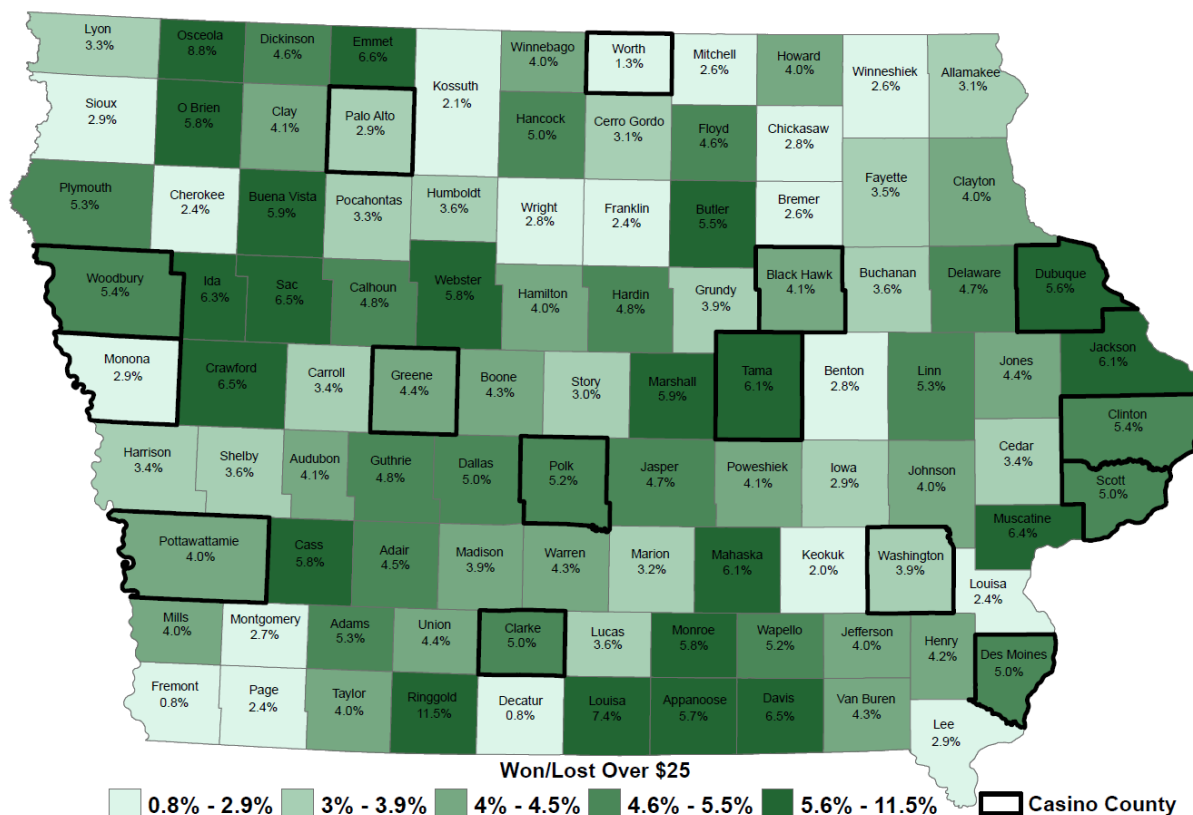


There was no statistical association between lifetime prevalence of student gambling and the presence or absence of a casino in the county.<sup>20</sup> Rates of lifetime gambling in counties with (25.0 percent) and without (25.1 percent) casinos was nearly the same. One-third of counties with casinos fell into the lowest category of student-reported lifetime gambling (16.4 percent to 21.5 percent).

<sup>20</sup>  $\chi^2 = 0.128, p > 0.7$

County's rankings for percent of students who won or lost over \$25 in a day appear in Figure 17. There was a statistical association between having a casino and the percentage of students who won or lost over \$25.<sup>21</sup>

**Figure 17: Percent of Students Won/Lost Over \$25 Gambling in a Day by Iowa County**



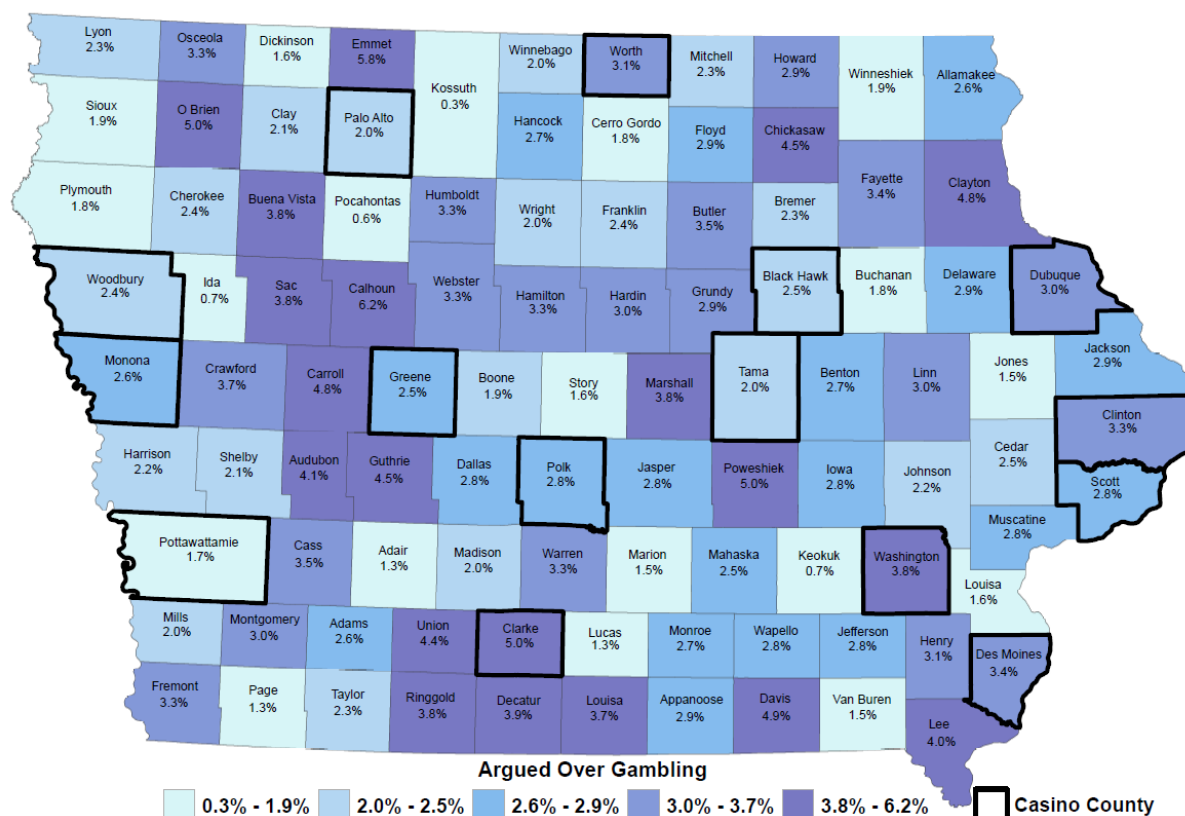
The percentage of students who won or lost over \$25 in a day was nearly the same for counties with (4.8 percent) and without (4.4 percent) a casino. None of the counties with the highest percentage of students winning or losing \$25 had a casino.<sup>22</sup> When the counties were ranked from the lowest to highest percentage of children with high wins/losses, there was no significant difference between counties with or without a casino.

<sup>21</sup>  $\chi^2 = 11.727, p < 0.001$

<sup>22</sup> Mann-Whitney  $z = 0.361, p > 0.70$

Percentages of students who argued with family or friends are shown in Figure 18. There was no evidence of a statistical association between having a casino and the county's percent of students who had gambling related arguments.<sup>23</sup>

**Figure 18: Percent of Students Argues Over Gambling by Iowa County**



<sup>23</sup>  $\chi^2 = .034, p > 0.85$

## 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. None of the 15 counties with casinos were in the highest percentage categories for more than one gambling measure. Additionally, only four of the 15 counties were in the highest category for any gambling measure. Yet there were real, but small, differences with some counties having higher or lower levels of winning or losing more than \$25 in one day. 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, Buena Vista, Emmet, O'Brien and Ringgold counties, all without casinos, consistently had the highest levels of student report lifetime gambling, winning or losing more than \$25 and arguing with family or friends about gambling.

## OTHER FACTORS ASSOCIATED WITH GAMBLING

In addressing the 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: substance use, depression, suicidal thoughts and other risky behaviors.

### *Substance Use (Lifetime)*

Lifetime gambling 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 five or more drinks of alcohol within a couple of hours (binge). Ever using tobacco is also shown, as are any drug use and any marijuana use.

**Table 2: Lifetime Substance Use**

Lifetime Use of:	Ever Gambled?		Risk Difference
	No	Yes	
<b>Alcohol</b>	23.2%	46.9%	23.7%
<b>Binge Drinking</b>	3.6%	9.6%	6.0%
<b>Marijuana</b>	6.7%	14.9%	8.2%
<b>Drugs</b>	14.9%	29.0%	14.1%
<b>Tobacco</b>	6.4%	16.0%	9.6%

In all instances, lifetime gambling 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

Table 3 shows the risk of lifetime gambling and three mental health concerns: feeling worthless, thoughts of suicide and depressive thoughts. All three indicators had a small but strong association with lifetime gambling. Students who reported any feelings of worthlessness had nearly two times the odds of lifetime gambling compared to students who reported having depressive thoughts all the time (OR=1.91; 95% C.I. 1.79 -2.04)<sup>24</sup>. Similarly, students who reported thoughts of suicide had over one-and-a-half the odds of gambling compared to students who did not report suicidal thoughts (OR=1.58; C.I. 1.51-1.65).<sup>25</sup>

**Table 3: Mental Health Concerns and Lifetime Gambling**

Within Past 12 Months:	Ever Gambled?		Risk Difference
	Yes	No	
Feeling Worthless	56.1%	48.6%	7.5%
Thoughts of Suicide	17.5%	11.9%	5.6%
Depressive Thoughts	21.1%	17.2%	3.9%

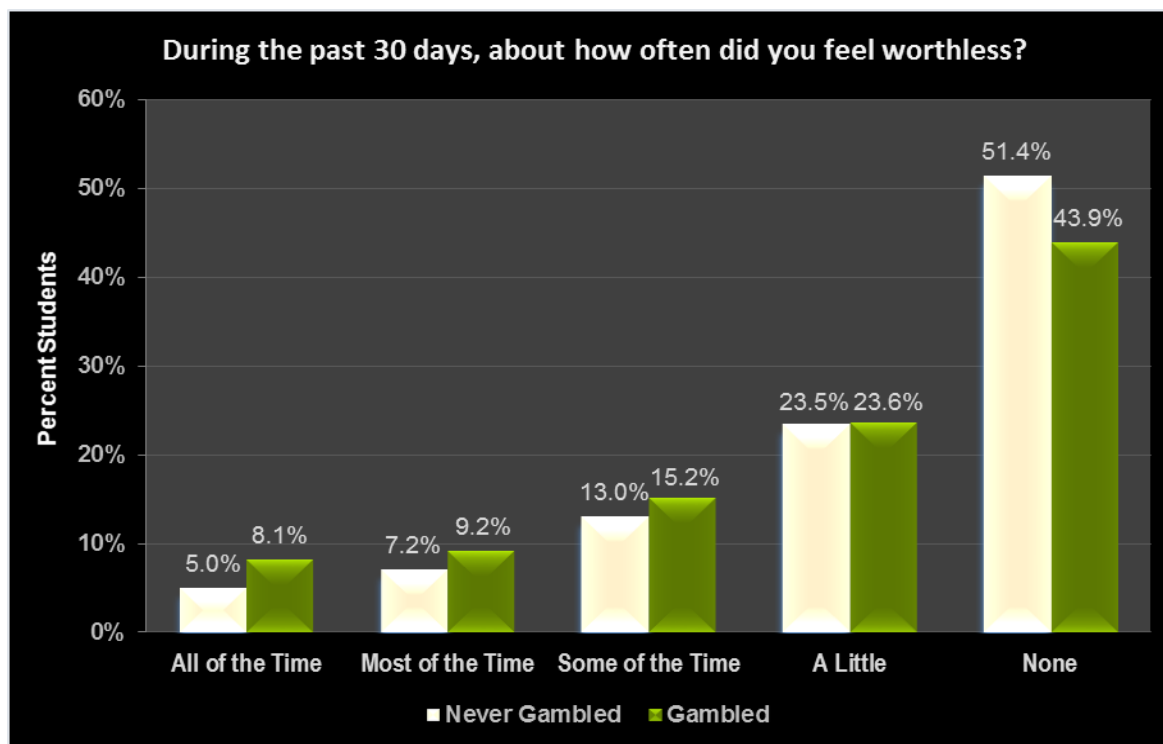
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<sup>24</sup> Logistic regression: Wald  $\chi^2 = 560.54$ ,  $df = 4$ ,  $p < 0.0001$

<sup>25</sup> Logistic regression: Wald  $\chi^2 = 414.17$ ,  $df = 4$ ,  $p < 0.0001$

Figure 19 shows lifetime gambling as it relates to feeling worthless. Students who have not gambled reported never feeling worthless more often than students who have gambled.<sup>26</sup> Students who have gambled experience slightly more days of feeling worthless than those who have not gambled.

**Figure 19: Lifetime Exposure to Gambling and Amount of Time Students Felt Worthless**



Feelings of worthlessness are also associated with arguing with family or friends over gambling.<sup>27</sup> Students who reported feeling worthless all of the time during the past 30 days were nearly three times more likely to report arguing about gambling with friends and family (5.5 percent vs. 15.1 percent).

There was also a significant association between students' lifetime gambling 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, 16 percent responded "Yes," while 20.3 percent of students who have gambled responded "Yes."<sup>28</sup> Thus, feelings of hopelessness were associated with an increased likelihood for lifetime gambling.<sup>29</sup> When we controlled for the grade and sex of the students, this likelihood increased<sup>30</sup> with students with feelings of hopelessness being 1.71 times more likely to report lifetime gambling.<sup>31</sup>

<sup>26</sup>  $\chi^2 = 339.44$ ,  $df = 1$ ,  $p < 0.0001$

<sup>27</sup>  $\chi^2 = 484.14$ ,  $df = 4$ ,  $p < 0.0001$

<sup>28</sup>  $\chi^2 = 190.57$ ,  $df = 1$ ,  $p < 0.0001$

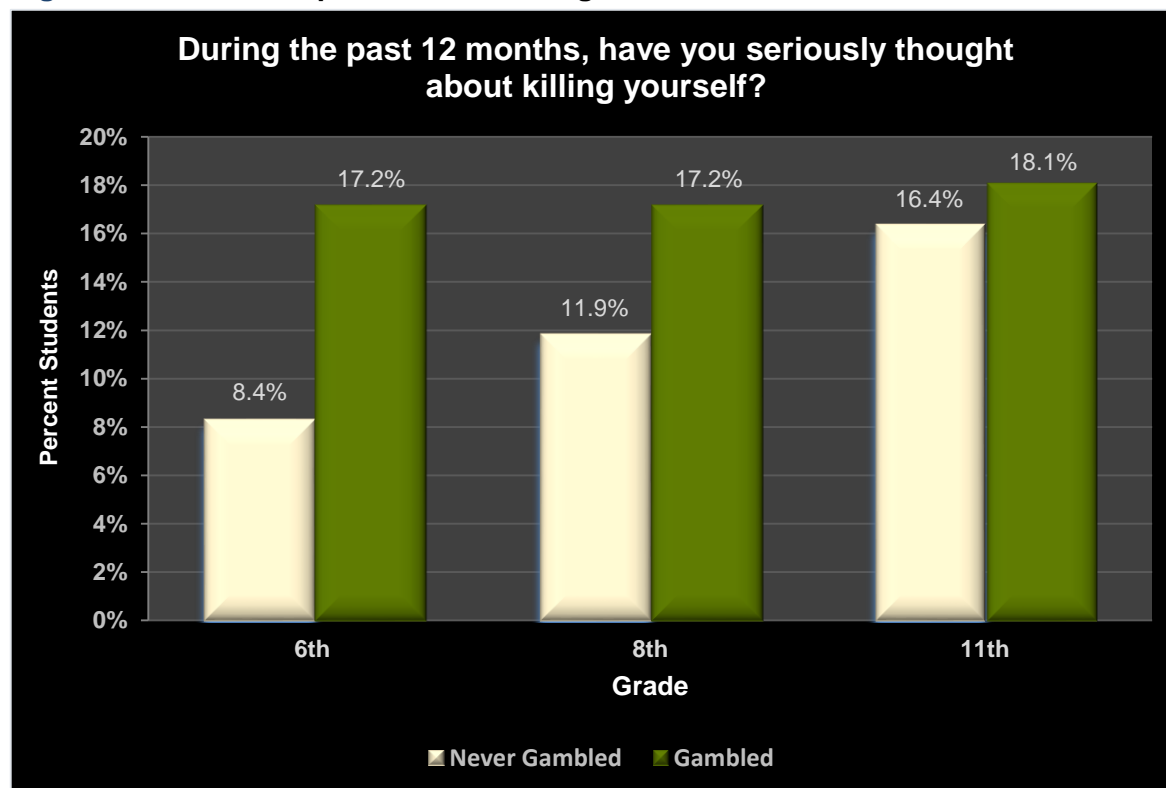
<sup>29</sup> Logistic regression: Wald  $\chi^2 = 191.08$ ,  $df = 1$ ,  $p < 0.0001$

<sup>30</sup> Logistic regression: Wald  $\chi^2 = 540.90$ ,  $df = 7$ ,  $p < 0.0001$

<sup>31</sup> Odds Ratio = 0.586, 95% Confidence Interval = 0.560, 0.613

While the effects of feelings of worthlessness and hopelessness were somewhat subtle, lifetime gambling was strongly associated with suicidal ideation when asked, "During the past 12 months, have you seriously thought about killing yourself?"<sup>32</sup> Viewed by grade, the effect is apparent at each level, but is significantly more pronounced in the younger grades (see Figure 20).<sup>33</sup> In analyses that are more sophisticated the effects remained once the student's sex was statistically controlled.

**Figure 20: Lifetime Exposure to Gambling and Suicidal Ideation**

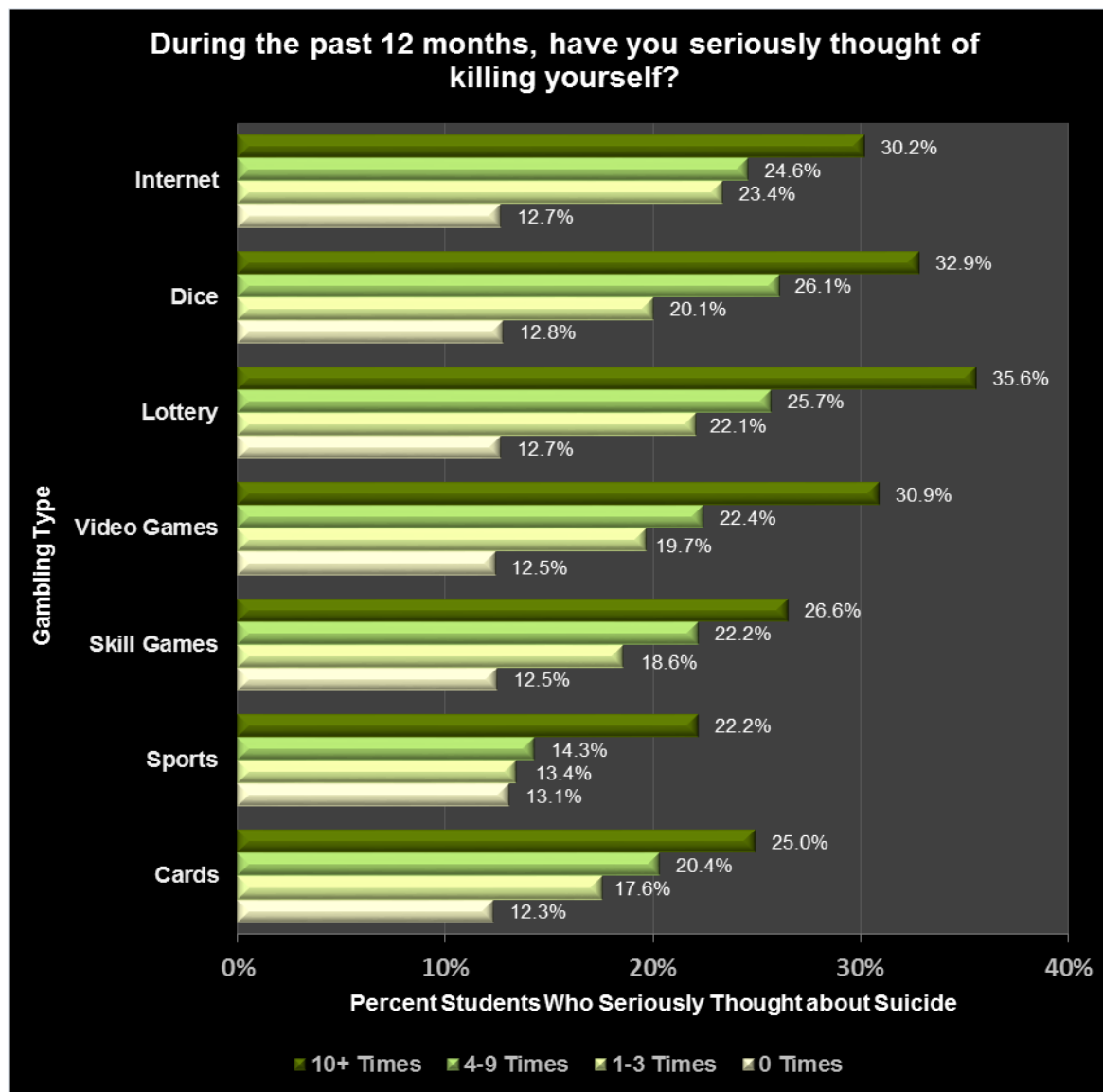


<sup>32</sup> Logistic regression, Wald  $\chi^2 = 455.67$ ,  $df = 1$ ,  $p < 0.0001$

<sup>33</sup> Logistic regression, interaction Wald  $\chi^2 = 64.32$ ,  $df = 1$ ,  $p < 0.0001$

Figure 21 illustrates the relationship between student reports of gambling frequency over the past 12 months and suicidal thoughts. While this risk factor relationship was evident over all levels of gambling frequency (0 times to nine 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 21).

**Figure 21: 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. Students with depression may demonstrate similar responses. Cognitive factors such as effective decision-making abilities and

executive functions developing in adolescents, may increase how attractive these behaviors and thoughts appear to students.



## Other Risky Behaviors

Gambling may be related to risky behavior or impulse control in general. Odds ratios were used to measure the likelihood other risky behaviors would be associated with problem gambling outcomes of lifetime gambling, won/lost more than \$25 in one day, and argument with friends or family over gambling. The following questions from the 2016 IYS were used:

- A. In the past 12 months, how often have you:
  1. Carried a gun, knife, club or other weapon to school or school event
  2. Used a weapon, force or threats to get money or things from someone
  3. Used alcohol or other illegal drugs on school property or school event
  4. Been disciplined for fighting, theft or damaging property at school or school event
  5. Damaged property just for fun
  6. Beaten up on or fought someone because they made you angry
  7. Verbally threatened to physically harm someone
  8. Stolen something
- B. In the past 30 days, how many times have you bullied someone else at school?
- C. How much do you agree or disagree that each of the following statements is true:
  1. It is against my values to have sex as a teenager
  2. Even if it is dangerous, I like to do exciting things

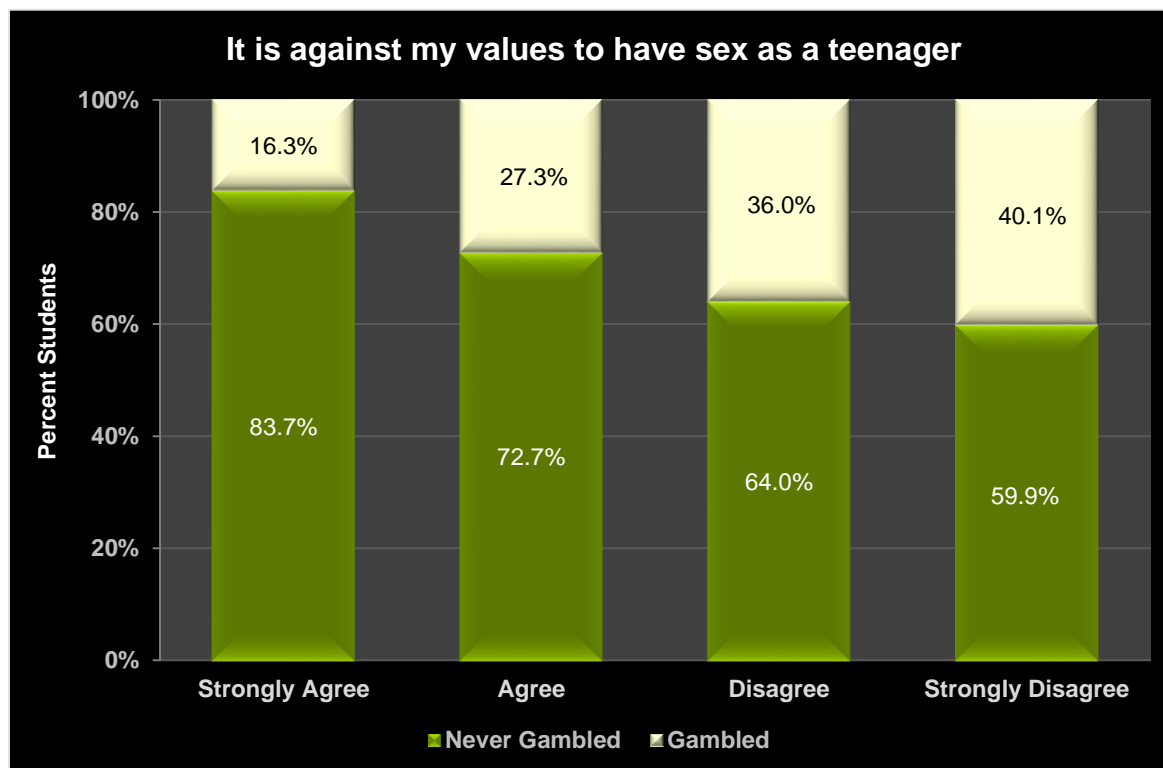
Of the other risky behaviors analyzed, many demonstrated relationships with outcome measures of lifetime gambling, won/lost more than \$25 in one day, argument with friends or family over gambling. Correlations are shown in Table 4.

**Table 4: Odds Ratios for Gambling Outcome Measures and Other Risky Behaviors**

Other Risky Behavior	Odds Ratios of Other Risky Behaviors Predicting the likelihood of Outcome Behaviors		
	Lifetime Gambling	Argued	Won/Lost >\$25
Carried a weapon at school	2.38	2.29	2.43
Used weapon at school	2.43	3.51	3.26
Used AOD at school	2.63	2.74	2.78
Disciplined	2.16	2.89	2.61
Damaged Property	2.28	3.39	3.17
Beat up Someone	2.13	2.61	2.35
Threatened someone	2.24	2.18	2.14
Stole	2.13	2.53	2.33
Bullied someone	1.44	1.66	1.58

Figure 22 shows the percent of students who have gambled compared to those who have never gambled and their level of agreement with the statement, “It is against my values to have sex as a teenager.” The odds of lifetime gambling for students who strongly disagree that sex is against their beliefs as a teenager are nearly three-and-a-half times the odds for students who strongly agree that having sex as a teenager is against their beliefs.<sup>34</sup>

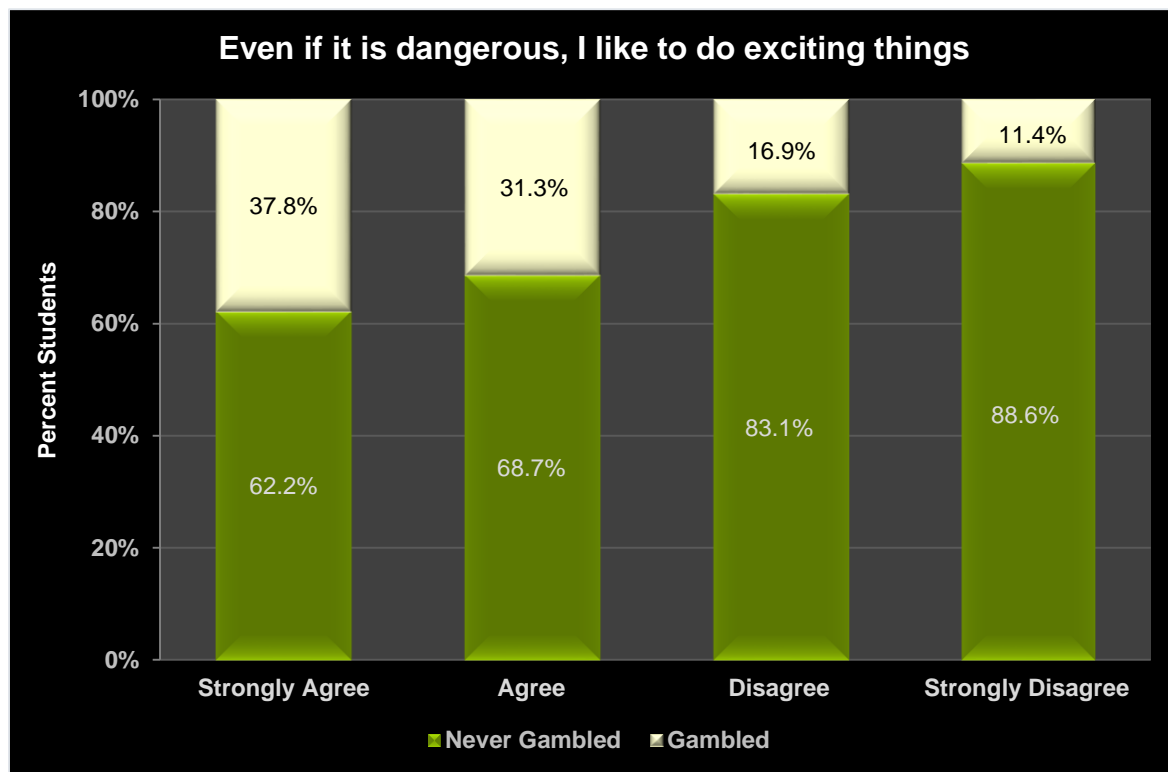
**Figure 22: Percent of Students Who Have Gambled and Belief about Sex as a Teenager**



<sup>34</sup> Logistic regression, Wald  $\chi^2 = 3257.84$ ,  $df = 3$   $p < 0.0001$

Figure 23 shows the percent of students who have gambled compared to those who have never gambled and their level of agreement with the statement, “Even if it is dangerous, I like to do exciting things.” The extent of agreement is negatively associated with the percent of students who have gambled.

**Figure 23: Percent of Students Who Have Gambled and Belief about Exciting Things**



## ***Summary***

Lifetime substance use had a very strong association with lifetime gambling and was most highly associated with alcohol use. Students who reported depressive thoughts and thoughts of worthlessness were also more likely to gamble. Thoughts of suicide were strongly related to gambling behaviors. Moreover, the largest effects between suicidal ideation and gambling were most obvious in sixth and eighth graders. Beliefs about sex as a teenager and engagement in potentially dangerous activities were also related to lifetime gambling. The risky behaviors analyzed may be related to impulse control and other conduct related issues.

## IYS 2012, 2014 AND 2016 YEAR COMPARISONS

The comparison between the 2012 - 2016 IYS gambling data was approached in a three-stage analysis. "Statistically significant" results are presented as well as the larger more meaningful differences.

First, each variable and its subcategories were tested for statistically significant differences **across each two-year comparison** (2012 - 2014 and 2014 - 2016;  $p < .001$ ). Results of two-year comparisons are in the "Sig." column and are indicated with a "yes" or "no." Second, a **risk difference** (RD) was calculated for each two-year comparison. An RD is a measure of effect size and RDs greater than five represent more clinically meaningful differences. Clinically meaningful differences are represented by red RDs and are a more meaningful portrayal of effect. Finally, if variables were significant and had meaningful RDs (greater than 5 percentage points), they were broken down **by grade and sex** to better illustrate where the differences are occurring.

Below, tables are provided with all comparison data accompanied by figures for meaningful differences between years. Some variables may be statistically significant, yet, they do not demonstrate clinically meaningful differences. This differentiation is due to the large sample size increasing the power of analyses to detect very small percentage differences as "statistically significant."

Table 5 shows gambling outcomes comparisons. The only meaningful difference in gambling outcomes between 2012 and 2016 is the increase in those who did not gamble within the past 12 months in 2014 (RD = 5.41). While measures of gambling significantly changed from 2014 to 2016 (lifetime gambling and money won or lost), these differences did not approach a level at which they would be clinically meaningful.

**Table 5: Outcomes 2012, 2014 and 2016 Year Comparisons**

Outcomes	2012 (%)	2014 (%)	2016 (%)	Risk Difference (2012 – 2014)	Sig.	Risk Difference (2014 – 2016)	Sig.
<b>Ever Gambled</b>					<b>No</b>		<b>Yes</b>
No	73.33	73.97	74.90	0.64		0.93	
Yes	26.67	26.03	25.10	0.64		0.93	
<b>Money Won or Lost</b>					<b>Yes</b>		<b>Yes</b>
Did not gamble in Past 12 months	73.66	79.07	80.19	<b>5.41</b>		1.12	
< \$10	16.14	12.15	11.21	3.99		0.94	
\$11-\$25	4.77	4.19	4.01	0.58		0.18	
\$26-\$50	2.38	1.98	1.98	0.40		0.00	
\$51-\$100	1.15	1.05	1.06	0.10		0.01	
> \$100	1.90	1.56	1.55	0.34		0.01	
<b>Argued</b>					<b>No</b>		<b>No</b>
No	97.13	97.22	97.28	0.09		0.06	
Yes	2.87	2.78	2.72	0.09		0.06	

Figure 24 illustrates the percentage of students who did not report gambling within the past 12 months of taking the survey for 2012, 2014 and 2016 split by grade and sex. The significant risk difference between 2012 and 2014 as indicated by Table 5 is being primarily driven by the sizeable increase of males who did not report gambling across all grades in 2014. However, from 2014 to 2016, the percent of students not reporting gambling within the past 12 months has remained relatively stable for both males and females of all grades.

**Figure 24: Percent of Students Who Did not Gamble in the Past Year, 2012 – 2016**

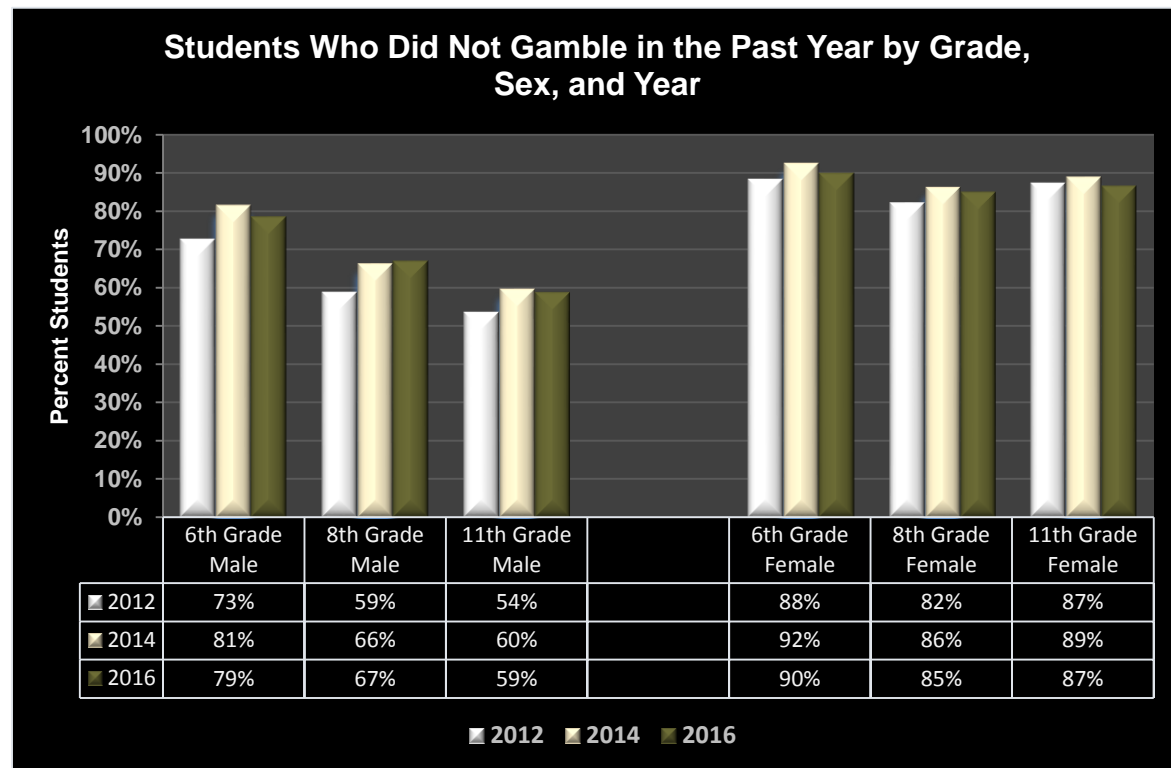


Table 6 represents differences in gambling types. While there was a statistically significant change in proportions of students reporting types of gambling between 2012 and 2014 and 2014 and 2016, the risk differences did not meet or exceed 5.0 percent, suggesting no meaningful differences.

**Table 6: Gambling Type 2012, 2014, and 2016 Year Comparisons**

Gambling Type	2012 (%)	2014 (%)	2016 (%)	Risk Difference (2012 – 2014)	Sig	Risk Difference (2014 – 2016)	Sig
<b>Sports</b>					<b>Yes</b>		<b>Yes</b>
0 Times	86.88	87.57	89.35	0.69		1.78	
1-3 Times	9.91	9.38	8.12	0.53		1.26	
4-9 Times	1.52	1.49	1.19	0.03		0.30	
> 9 Times	1.70	1.57	1.34	0.13		0.23	
<b>Cards</b>					<b>Yes</b>		<b>No</b>
0 Times	84.75	85.87	85.94	1.12		0.07	
1-3 Times	11.20	10.53	10.32	0.67		0.21	
4-9 Times	2.15	1.93	1.98	0.22		0.05	
> 9 Times	1.90	1.67	1.75	0.23		0.08	
<b>Internet</b>					<b>No</b>		<b>Yes</b>
0 Times	96.88	96.91	95.57	0.03		1.34	
1-3 Times	1.73	1.79	2.55	0.06		0.76	
4-9 Times	0.42	0.47	0.63	0.05		0.16	
> 9 Times	0.98	0.83	1.25	0.15		0.42	
<b>Skill</b>					<b>Yes</b>		<b>Yes</b>
0 Times	89.13	90.06	90.21	0.93		0.15	
1-3 Times	7.98	7.43	7.17	0.55		0.26	
4-9 Times	1.40	1.31	1.4	0.09		0.09	
> 9 Times	1.49	1.21	1.21	0.28		0.00	
<b>Video Games</b>					<b>Yes</b>		<b>No</b>
0 Times	91.10	91.88	91.94	0.78		0.06	
1-3 Times	6.00	5.56	5.40	0.44		0.16	
4-9 Times	1.24	1.17	1.15	0.07		0.02	
> 9 Times	1.66	1.38	1.51	0.28		0.13	
<b>Dice</b>					<b>Yes</b>		<b>Yes</b>
0 Times	95.70	96.22	95.80	0.52		0.42	
1-3 Times	2.83	2.61	2.78	0.22		0.17	
4-9 Times	0.56	0.47	0.65	0.09		0.18	
> 9 Times	0.91	0.70	0.78	0.21		0.18	
<b>Lottery</b>					<b>Yes</b>		<b>No</b>
0 Times	94.70	95.20	95.30	0.50		0.10	
1-3 Times	3.33	3.11	3.15	0.22		0.04	
4-9 Times	0.81	0.78	0.76	0.03		0.02	
> 9 Times	1.16	0.91	0.80	0.25		0.11	

Table 7 represents differences in reported gambling by demographic characteristics. None of the risk differences in this table approached the appropriate level to be clinically meaningful (5.0 percent). From 2012 to 2016, it appears that fewer White students are reporting gambling. The difference between 2012 and 2014 is due to a change in data collection. In 2012, neither “Multiple Races” nor “Other Race” were response options. However, from 2014 to 2016 there is a moderate yet clinically insignificant decline (3.75 percent) in the percentage of White students reporting gambling.

**Table 7: Demographics 2012, 2014, and 2016 Year Comparison**

Demographics	2012 (%)	2014 (%)	2016 (%)	Risk Difference (2012 – 2014)	Sig	Risk Difference (2014 – 2016)	Sig
<b>Grade</b>					<b>Yes</b>		<b>No</b>
6th	25.81	23.37	23.42	2.44		0.06	
8th	38.96	38.97	38.35	0.01		0.56	
11th	35.24	37.66	38.24	2.42		0.51	
<b>Sex</b>					<b>No</b>		<b>No</b>
Male	73.42	72.39	73.01	1.03		0.62	
Female	26.58	27.61	26.99	1.03		0.62	
<b>Race/Ethnicity</b>					<b>Yes</b>		<b>Yes</b>
White	82.03	77.14	73.39	--		3.75	
African American	6.30	5.02	5.70	--		0.68	
American Indian	1.71	1.04	1.05	--		0.01	
Asian/PI	2.34	1.83	2.54	--		0.71	
Latino	7.62	6.88	8.39	--		1.51	
Multiple Races	-- <sup>1</sup>	6.68	7.61	--		0.93	
Other Race	-- <sup>1</sup>	1.41	1.33	--		0.08	
<b>Living Situation</b>					<b>No</b>		<b>No</b>
1 Parent	21.22	21.18	20.34	0.04		0.84	
2 Parents	71.78	72.22	72.9	0.44		0.68	
Other Relatives	2.54	2.41	2.48	0.13		0.07	
Foster Parents	0.47	0.36	0.40	0.11		0.04	
Shelter Care	0.26	0.25	0.22	0.01		0.03	
Group Home	0.19	0.12	0.18	0.07		0.06	
Independently	0.40	0.42	0.41	0.02		0.01	
Other	3.14	3.04	3.08	0.10		0.04	
<b>Parent(s) in Military</b>					<b>No</b>		<b>No</b>
Currently Deployed	0.78	0.74	0.97	0.04		0.23	
Recently Returned	1.63	1.64	1.73	0.01		0.09	
Military Not Deployed	1.79	1.96	2.13	0.17		0.17	
Non-Military	95.80	95.66	95.16	0.14		0.50	

1. Note: Multiple races and Other Race were not options in 2012.

Table 8 shows substance use comparisons. From 2012 to 2014, among youth reporting gambling, there was a statistically significant and clinically meaningful increase (8.06 percent) in the percentage of students reporting lifetime alcohol use. The percentage of students ever gambling who reported lifetime gambling use remained unchanged in 2016. The relationship between drinking more than five drinks in a row (binge drinking) and tobacco use with reported lifetime gambling were significantly different between 2014 and 2016. However, the risk difference was not large enough to be clinically meaningful.

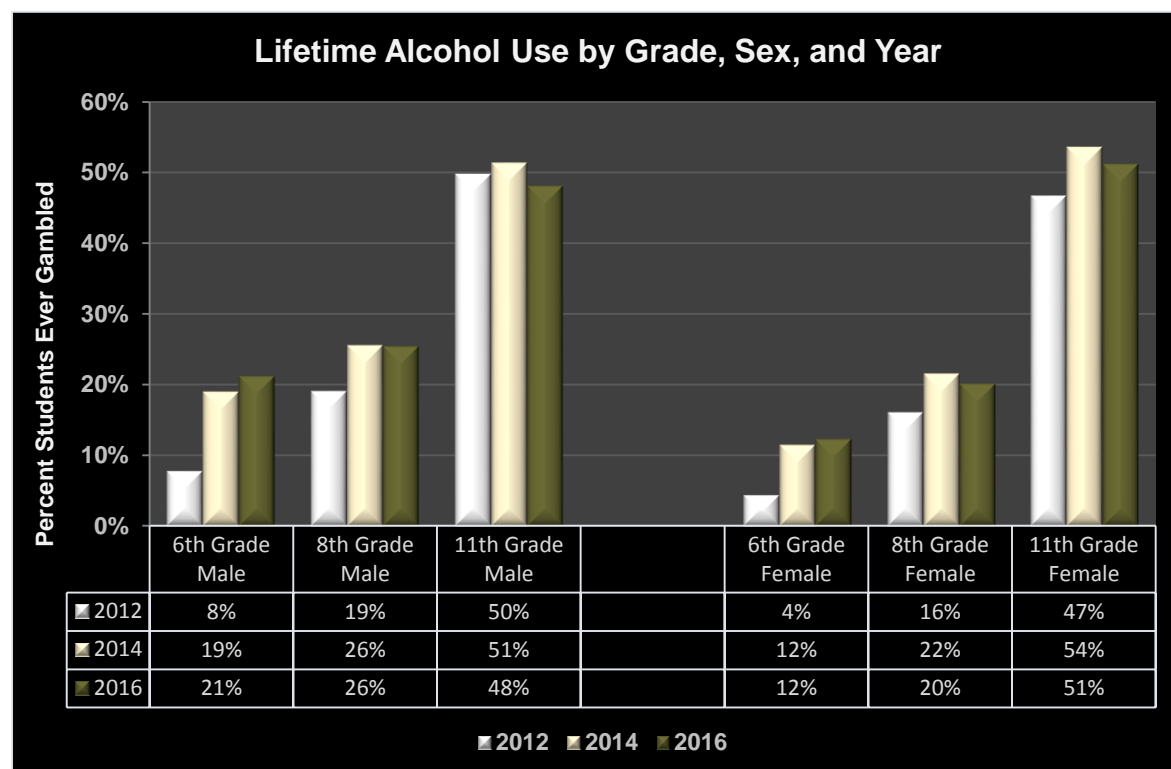
**Table 8: Substance Use 2012, 2014, and 2016 Year Comparison**

Gambling Correlates	2012 (%)	2014 (%)	2016 (%)	Risk Difference (2012 – 2014)	Sig	Risk Difference (2014 – 2016)	Sig
<b>Alcohol Ever</b>					<b>Yes</b>		<b>No</b>
No	61.05	52.99	53.09	<b>8.06</b>		0.37	
Yes	38.95	47.01	46.91	<b>8.06</b>		0.37	
<b>Marijuana Ever</b>					<b>No</b>		<b>No</b>
No	84.19	84.50	85.13	0.31		0.60	
Yes	15.81	15.50	14.87	0.31		0.60	
<b>Drugs Ever</b>					<b>No</b>		<b>No</b>
No	71.23	70.86	70.99	0.37		0.24	
Yes	28.77	29.14	29.01	0.37		0.24	
<b>Tobacco Ever</b>					<b>Yes</b>		<b>Yes</b>
No	78.95	80.64	84.03	1.69		3.39	
Yes	21.05	19.36	15.97	1.69		3.39	
<b>Binge Drinking</b>					<b>Yes</b>		<b>Yes</b>
No	85.45	89.00	90.38	3.55		1.38	
Yes	14.55	11.00	9.62	3.55		1.38	
<b>Suicidal Ideation</b>					<b>No</b>		<b>No</b>
No	82.18	82.42	82.46	0.24		0.04	
Yes	17.82	17.58	17.54	0.24		0.04	
<b>Worthlessness Feelings</b>					---		---
All the Time	5.90	6.55	8.14	0.65		-- <sup>2</sup>	
Most of the Time	7.15	8.64	9.20	1.49		-- <sup>2</sup>	
Some of the Time	12.84	14.45	15.19	1.61		-- <sup>2</sup>	
A Little	21.17	21.70	23.58	0.53		-- <sup>2</sup>	
None	46.69	41.83	43.90	4.86		-- <sup>2</sup>	
Don't Know	6.25	6.82	n/a	0.57		-- <sup>2</sup>	
<b>Hopelessness Feelings</b>					<b>No</b>		<b>No</b>
No	80.63	79.66	78.91	0.97		0.75	
Yes	19.37	20.34	21.09	0.97		0.75	

2. Note: "Don't Know" was not a response option in 2016.

Figure 25 shows the percentage of students reporting alcohol in their lifetime among students who have ever gambled separated by gender-grade groups. The increase in alcohol use between 2012 and 2014 is powering the significant risk difference in alcohol use indicated in Table 8. The increase in reported alcohol use in 2014 is evident for nearly every gender-grade category and is strongest among younger students. For example, from 2012 to 2014 the percent of sixth grade students reporting alcohol use tripled among females (4 percent to 12 percent) and doubled for males (8 percent to 19 percent). However, among 11<sup>th</sup> grade students, the reported alcohol use increased by 6 percentage points for females while changes for males were negligible. Nonetheless, from 2014 to 2016, the percent of students reporting alcohol use has remained relatively stable for both males and females of all grades.

**Figure 25: Life Time Alcohol Use among Students Who Have Gambled, 2012 – 2016**



## Summary

For the most part, the attitudes and behaviors related to gambling have remained significantly unchanged between 2012 and 2016. There were two instances wherein there was a statistically significant and clinically meaningful difference in gambling outcomes or gambling correlates: gambling within the past 12 months and lifetime alcohol use. In both cases, the differences were due to increases in reporting between 2012 and 2014. None of the correlates of gambling nor the reported gambling activities meaningfully changed from 2014 to 2016.

## IOWA GAMBLING EXPOSURE SCALE (IGES)

There is a continuum of a youth's past-year gambling exposure. One youth might gamble while playing cards with family once or twice during the past year while another youth often bets online or plays pool, with a variety of other venues. The IYS asks seven questions about how often a youth gambled in different venues over the past year: Sports, Cards, Internet, Personal Skill Games, Video (or Arcade) Games, Dice Games and Lottery tickets. Each question is scaled into four ordinal categories, 0 times, 1 – 3 times, 4 – 9 times, and 10 or more times.

**Figure 26: Facsimile of Iowa Gambling Venue Questions**

During the past 12 months, how many times have you bet or gambled for money or possessions in any of the following ways:

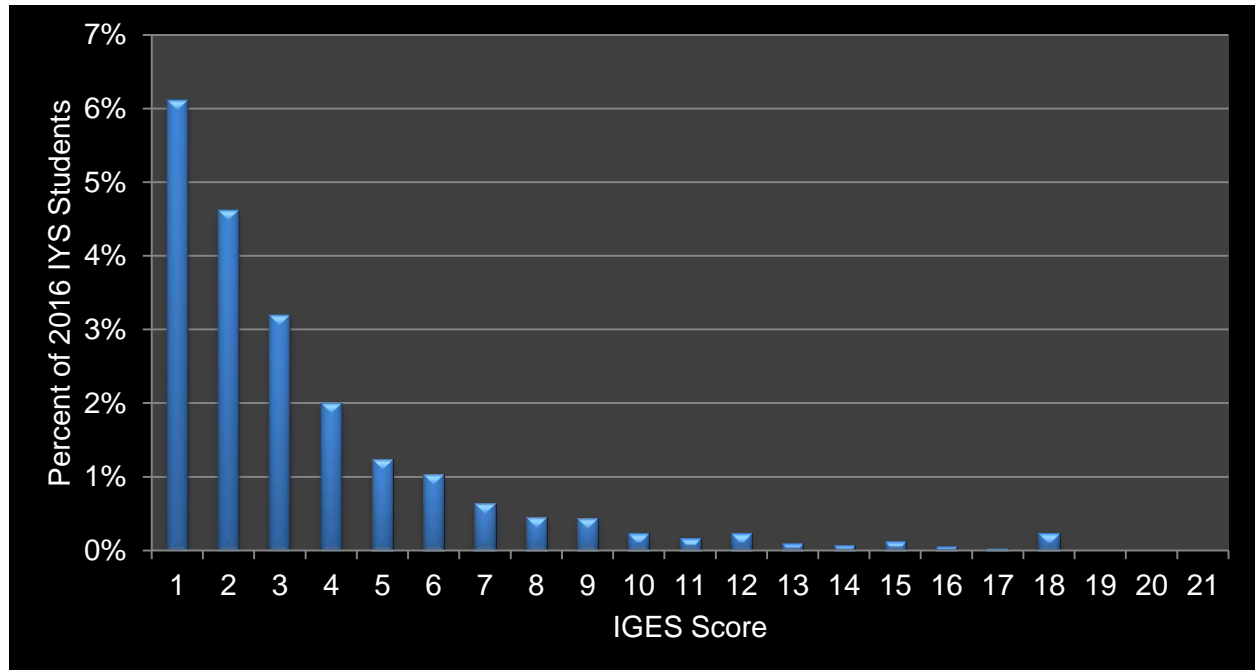
	0 times	1-3 times	4-9 times	10 or more times
54. Sports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
55. Card games with friends or family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
56. Internet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
57. Personal skill games such as pool, bowling, or dominoes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
58. Video or arcade games?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
59. Dice games?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
60. Lottery scratch off tickets or numbers?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The following analyses assess the reliability and various types of validity for a simple measure of gambling exposure. Although analyses assessed several different scoring schemes, a simple sum of the seven items provided the best measure. Of these, the sum of the seven items, IGES, is the only scoring that will be discussed along with an optimal cut-point for predicting problems.

Each question was scored 0 through 3 and summed. The lowest possible score was 0 and the highest score was 21. Using the entire 2016 IYS sample, the mean score was 0.73 and the

standard deviation was 2.06. Nearly four out of five (79.07 percent) youth received a 0, suggesting no gambling in any form over the past year. For those who gambled at least once, the mean IGES score was 3.52 (median = 2) with a standard deviation of 3.24. Figure 27 shows the percentage of students receiving each IGES score omitting the lowest score, zero.

**Figure 27: Distribution of IGES Score Greater Than Zero**



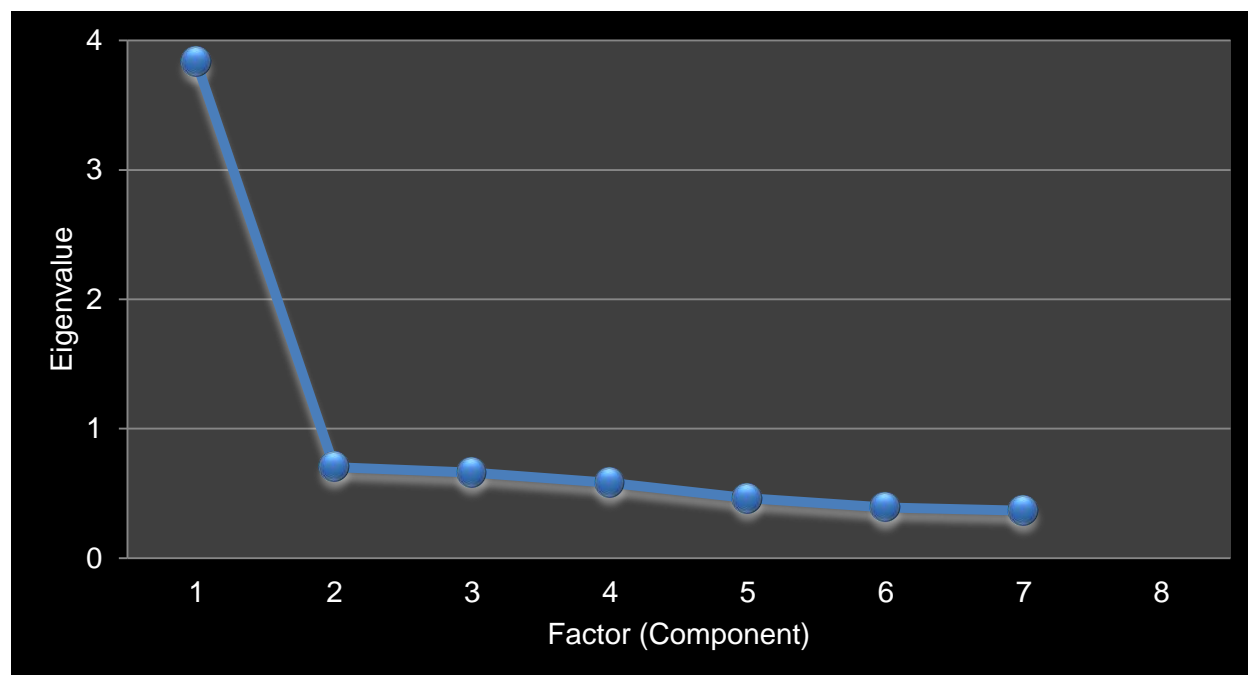
### ***Reliability***

Internal consistency reliability using the seven questions for the IGES was very good; Cronbach's alpha was 0.86 for the simple sum. Inspection of the individual questions indicated that all items contributed to the high internal consistency. The alpha always went down when any item was removed from the set. Questions all correlated with the sum and all (corrected) correlations ranged from a low of 0.52 to a high of 0.72. Thus, all of the items appeared to contribute to the IGES, correlate with the sum of the other items, and the internal consistency was well within acceptable values.

## Factor Validity

A principal component (factor) analysis suggested that these seven questions represented a single dimension. The first component (factor) accounted for 54.8 percent (eigenvalue = 3.83) of the total variance and no other components had an eigenvalue greater than 1.0. The eigenvalue directly relates to the percentage of variance each component summarizes. The second component's eigenvalue was 0.70. Figure 28 shows a "Scree Plot" of the eigenvalues against the sequential components (factors). Components 2 through 7 gradually taper off and appear to represent noise, leaving only the first component.

**Figure 28: Scree Plot Following a Principal Components Analysis Using Seven IYS Questions**



We also used a multiple group factor analysis<sup>35</sup> with a predefined single factor, the sum of the question responses. Using corrected (item-total) correlations or multiple R-squares to estimate communality, the single predefined factor accounted for all of the common variance. This, again, suggests a single factor underlying the seven questions. The factor validity for a simple sum seems strong.

<sup>35</sup> Gorsuch, R. L. (1974). *Factor Analysis*. Philadelphia: W. B. Saunders Company.

Arndt, S. (1983). *Multiple group factor analysis*. *American Statistician*, 37, 326.

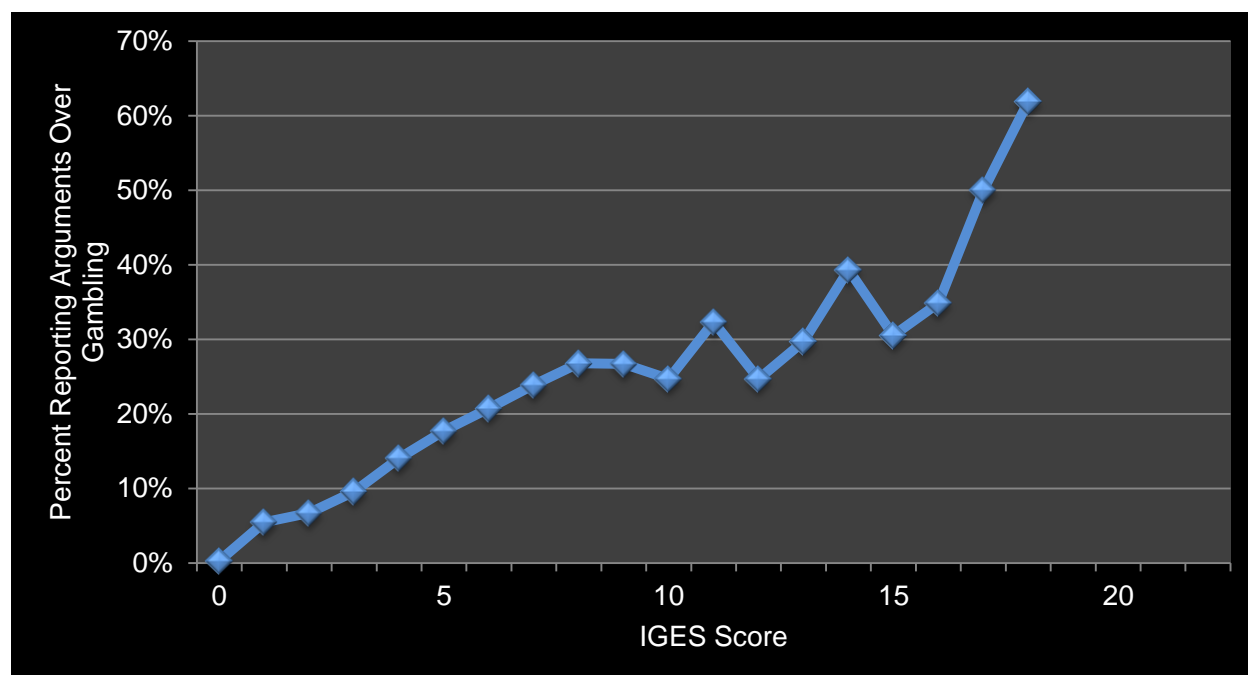
Soto, C. M., & Arndt, S. (2013). *Análisis factorial confirmatorio de la Escala de Estilos de Crianza de Steinberg: validez preliminar de constructo*. *Revista de Psicología*, 22(2), 189-214.

### Criterion Validity and Determining a Cut-Off for Problem Gambling

The 2016 IYS contains a question, "In the past 12 months, have you argued with family, friends, or others because of your gambling (betting)?" In the total sample of IYS responses, 2.78 percent of students responded "Yes" to this question. This question was taken as a direct indication of potential problems with gambling.

The IGES sum score showed a strong and significant predictive relationship with the argument question (Wald  $\chi^2 = 4168.95$ ,  $df = 1$ ,  $p < 0.0001$ ) using logistic regression. Figure 29 shows the IGES scores and the percentage of students who argued about their gambling.

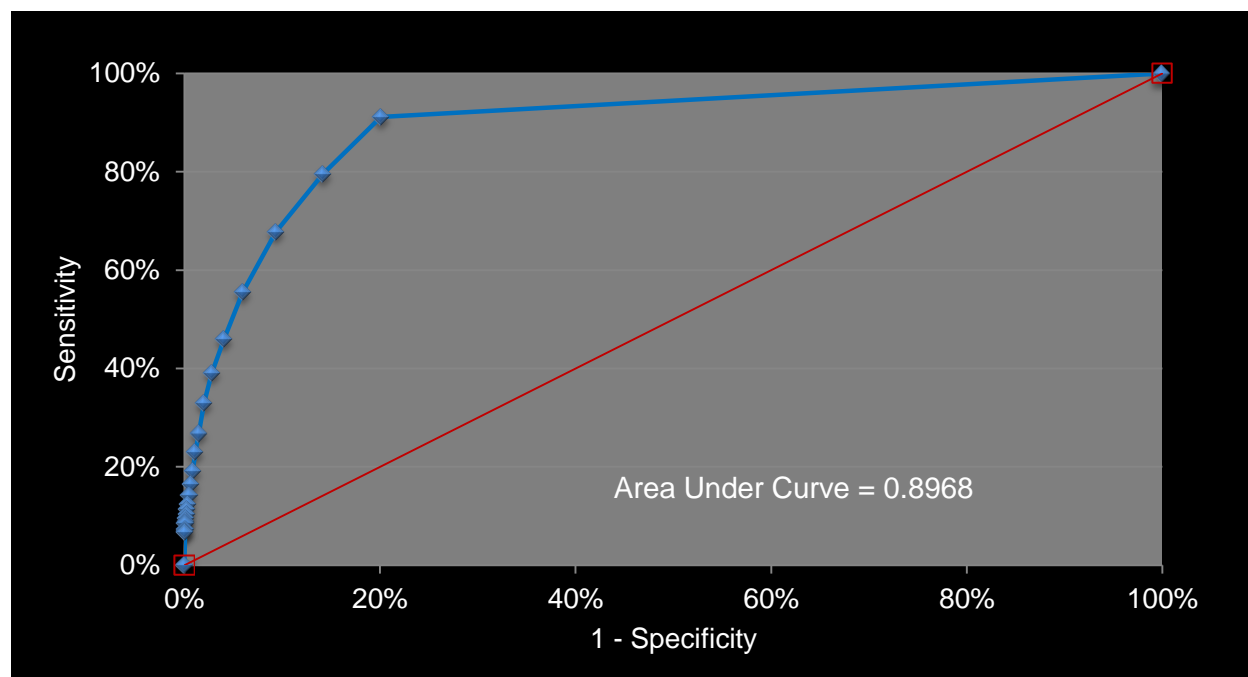
**Figure 29: IGES Scores and the Percentage of Youth Who Argued About Gambling**



Both the IGES sum score and the argument question were related to the students sex (Mann-Whitney  $z = 66.82$ ,  $p < 0.0001$ ) and grade (Kruskal-Wallis  $\chi^2 = 1171.27$ ,  $df = 2$ ,  $p < 0.0001$ ), so the analysis was repeated controlling for sex and grade. The IGES sum score remained highly predictive of reporting arguments (Wald  $\chi^2 = 3708.83$ ,  $df = 1$ ,  $p < 0.0001$ ).

Figure 30 shows the results of a Receiver Operator Characteristics (ROC) analysis using argument as the criterion and IGES scores as the predictor.

**Figure 30: ROC Analysis Predicting Student Arguments from IGES Score**



Using a traditional criterion<sup>36</sup>, the optimal cut-point for the IGES scores is 0.5, i.e., a zero score indicates a negative screen while a 1 or more indicates a positive screen. Using this cut-point for problem gambling the sensitivity is 91.33 percent and the specificity is 80.94 percent. Table 9 shows these results.

**Table 9: Results Using IGES => One as an Indicator of Problem Gambling**

Argued About Gambling?	IGES => 1	
	No Number (%)	Yes Number (%)
No	64,017 (80.9%)	15,078 (19.1%)
Yes	191 (8.7%)	2,012 (91.3%)

This cut-off score may be overly stringent for a few reasons. It identifies youth who gambled while playing cards with their families only one time in the past year as potentially having a gambling problem. Furthermore, while 91.1 percent of students (1,924) who had arguments about gambling are correctly identified, missing only 8.9 percent (187) appears successful; another 14,845 students are incorrectly identified. Thus, standard methods for determining the cut-off points may need to be revisited.

<sup>36</sup> Youden, W.J. (1950). Index for rating diagnostic tests. *Cancer* 3: 32–35.

### Further Analyses of Individual Questions

Based on the analyses of internal consistency for these questions, all of the items appeared to benefit the IGES scoring. Removing any item resulted in a slightly lower internal consistency. However, all of the items may not equally predict problems with gambling. The following exploratory analysis used students' responses to each question to predict arguments about gambling. A multivariate logistic regression was used to predict arguments controlling for sex and grade. Results are shown in Table 10.

**Table 10: Odds of Argument for IGES Gambling Types**

IYS Question:	Odds Ratio	95% Confidence Interval
54. Sports	1.7	1.6 - 1.9
55. Card games with friends or family	1.7	1.6 - 1.9
56. Internet?	1.1	1.1 - 1.2
57. Personal skill games such as pool, bowling, or dominoes?	1.3	1.2 - 1.4
58. Video or arcade games?	1.2	1.1 - 1.3
59. Dice games?	1.1	1.0 - 1.2
60. Lottery scratch off tickets or numbers?	1.4	1.3 - 1.5

Interestingly, playing (and betting on) cards with family and friends shows the one of the strongest odds-ratio when predicting arguments. All questions significantly predicted arguments.

Using more criterion markers for gambling problems and their correlates may shed more light on the value of each item and, perhaps, further support choosing an optimal cut-point score.

Preliminary analyses suggest that the IGES correlates with:

- Past 30-day alcohol use
- Past 30-day marijuana use
- Ever having driven a car after using alcohol/drugs
- Past-year alcohol or other illegal drugs on school property/event
- Past-year disciplined for fighting, theft, or damaging property at school/event
- Past-year Carried a gun, knife, club, or other weapon to school/event
- Past-year beaten up on or fought someone because they made you angry
- Number of hours outside of school with no adult supervision
- Disagreement with:
  - "It is against my values to have sex as a teenager"
  - "Violence is the worst way to solve problems"

## **Summary**

The IGES seems to have high internal consistency reliability and shows extremely promising concurrent predictive validity using a variety of criterion questions (e.g., arguments over gambling). Item analyses suggest that all items support the internal consistency. However, all items may not support the predictive validity, at least, with the one criterion investigated (arguments over gambling). Analyses into the optimal cut-off point suggest a value of 1 or greater as an indicator of potential problems, although without further analyses using different criteria this suggestion is likely premature. Further analyses with more criteria will also shed more light on the usefulness of all of the questions.