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Adolescent Alcohol-Drinking Frequency and Problem-Gambling Severity: Adolescent Perceptions Regarding Problem-Gambling Prevention and Parental/Adult Behaviors and Attitudes

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Abstract

Background—To examine in adolescents how alcohol-drinking frequency relates to gambling-related attitudes and behaviors and their perceptions of both problem-gambling prevention strategies and adult (including parental) behaviors/attitudes.

Methods—A survey assessing alcohol, gambling and health and functioning measures in 1609 high-school students. Students were stratified into low-frequency/non-drinking and high-frequency drinking groups, and into low-risk and at-risk/problematic gambling groups.

Results—High-frequency drinking was associated with at-risk/problematic gambling ($\chi^2(1, N=1842)=49.22, p<.0001$). High-frequency-drinking versus low-frequency/non-drinking adolescents exhibited more permissive attitudes towards gambling (e.g., less likely to report multiple problem-gambling prevention efforts to be important). At-risk problematic gamblers

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AUTHOR CONTRIBUTIONS

Drs. Hoff, Krishnan-Sarin and Potenza were responsible for participant recruitment, data collection, and managing the experimental design of this study. Dr. Marvin Steinberg provided input on the study questionnaire. Drs. Pilver and Hoff designed and conducted data analyses. Mr. Rahman and Dr. Balodis, with Dr. Potenza's assistance, conducted literature searches and wrote the first draft of the manuscript, including abstract, introduction, methods, results, and discussion. All authors, including Drs. Rugle and Leeman, have read, provided comments on and approved the final draft of the manuscript.

exhibited more severe drinking patterns and greater likelihood of acknowledging parental approval of drinking ($\chi^2(1, N=1842)=31.58, p<.0001$). Problem-gambling severity was more strongly related to gambling with adults among high-frequency-drinking adolescents (odds ratio [OR]=3.17, 95% confidence interval [95%CI]=[1.97, 5.09]) versus low-frequency/non-drinking (OR=1.86, 95%CI=[0.61, 2.68]) adolescents (Interaction OR=1.78, 95%CI=[1.05, 3.02]).

Conclusions—Inter-relationships between problematic drinking and gambling in youth may relate to more permissive attitudes across these domains. Stronger links between at-risk/problem gambling and gambling with adults in the high-frequency-drinking group raises the possibility that interventions targeting adults may help mitigate youth gambling and drinking.

Keywords

gambling; adolescence; alcohol drinking; gambling prevention; parental attitudes

INTRODUCTION

Adolescents frequently engage in risky behaviors such as gambling and drinking^{1,2}. Between 50% and 90% of adolescents have gambled in the past-year^{3,4}, with 10%-15% of adolescents appearing at-risk for developing gambling problems and 4%-8% already experiencing such problems^{5,6}. Similarly, drinking is prevalent among adolescents⁷, and early alcohol use is associated with subsequent substance dependence and criminal involvement⁸. Seventy-eight percent of US adolescents have consumed alcohol by age 18 and nearly 47% drink regularly⁹, with approximately 15% meeting *DSM-IV* criteria for lifetime alcohol abuse. Among adolescents, gambling and alcohol-use problems frequently co-occur¹⁰. However, the specific factors that relate gambling and drinking behaviors among youth are incompletely understood.

Adults, particularly parents, may influence adolescent engagement in gambling and drinking, either by promoting or limiting involvement. For example, high levels of parental knowledge, monitoring, and communication may decrease problems arising from gambling and drinking¹¹⁻¹⁴. Parental knowledge may have a protective effect against high-risk adolescent drinking, possibly through direct adolescent disclosure of activities^{13,15}. Perceived parental perceptions of alcohol consumption are also strongly correlated with adolescent binge drinking, with clearly communicated parental disapproval associated with lower levels of alcohol use¹⁶⁻¹⁸.

The importance of parental attitudes has also been observed in adolescent gambling¹⁹. Parental ambivalence towards their children gambling is positively associated with children's likelihoods of experiencing gambling problems²⁰. Similarly, better parental communication has been negatively related to adolescent problem gambling^{21,22}. In a Canadian sample of frequent adolescent gamblers, 86% gambled with family and 40% directly with parents²³. In Kundu et al. (2013), we observed relationships that receipt of lottery ticket gifts among youth has been associated with perceived parental permissiveness towards gambling, earlier age of gambling onset, and stronger links between age at gambling onset and problem-gambling severity^{24,25}. More generally, in Leeman et al. (in

press), we observed perceived parental permissiveness towards gambling as being related to negative health outcomes and gambling behaviors in adolescents²⁵.

Although both gambling and substance use carry risks, both parents and adolescents report gambling as less concerning compared to alcohol and drug use²². The perception of gambling as less risky poses concern considering the association between parental attitudes and risky behaviors in general. For example, alcohol misuse predicted increased gambling in adolescent males when controlling for parental monitoring, and increased parental monitoring decreased alcohol use and gambling². Moreover, the importance of parental influences on gambling activity and alcohol use together has been observed across both genders, though girls were observed to gamble more only when they both misused alcohol and experienced lower parental monitoring^{1,2,26-29}. While research indicates the importance of parental influences on gambling and drinking, few studies have investigated how alcohol-drinking frequency relates to adolescents' attitudes towards gambling (including perceived parental permissiveness towards gambling) and how alcohol-drinking frequency may moderate associations between problem-gambling severity and gambling-related characteristics. Studies indicate that there is a relationship between drinking frequency and gambling severity in adolescents, suggesting drinking frequency as a moderating factor in adolescent gambling behavior³⁰. However, studies have not examined how problem-gambling severity may relate to adolescent perceived permissiveness toward alcohol. An improved understanding of the relationships between alcohol-drinking frequency and problem-gambling severity as related to parental influences would provide a better foundation for the development of improved prevention and treatment strategies among adolescents.

Given the frequent co-occurrence of risky/problematic alcohol use and gambling as well as the influence of parental perceptions on both, our aim was to better understand the relationships between these domains. To do this, we utilized a large survey of Connecticut high school students (N=4523) and analyzed data from students who provided information regarding gambling and drinking behaviors (n=1842). In our analyses, we stratified respondents into 2 drinking groups (high-frequency-drinking [HFD] and low-frequency/non-drinking [LFD]) and 3 gambling groups (at-risk/problem-gambling (ARPG), low-risk gambling (LRG) and non-gambling [NG]).

Based on our review of the literature, we had the following *a priori* hypotheses: 1) ARPG would be associated with HFD; 2) ARPG versus LRG and NG adolescents would more frequently report parents with more permissive attitudes towards alcohol; 3) HFD versus LFD adolescents would show differences with respect to gambling-related attitudes, behaviors and experiences involving adults or adult-related restrictions, including more frequently reporting permissive attitudes towards gambling like perceived parental permissiveness towards gambling and less frequently reporting gambling-related preventions as important; and, 4) ARPG would be more strongly related to gambling with adults and family members among HFD versus LFD adolescents. Our data analytic strategy was based on the hypotheses listed above.

METHODS

Study participants and instrument

The parent survey from which the current sample was derived has been described previously^{10,24,25,31-39}. All 4-year and non-vocational or special education high schools in the state of Connecticut were invited to participate in a survey of risk behavior. All schools showing interest were contacted by research staff. In return for participating, schools were given a profile of risky behaviors occurring in that school. After the initial response, a targeted selection of schools was conducted for the geographic regions not initially well represented. The final sample population included schools from all geographic regions and three tiers of district reference groups in Connecticut. District reference groups are based on the socio-economic status of the households comprising those districts and were included in this survey to account for the socioeconomic differences between the various schools. Therefore, although the final selection (N=4,523) was not random, it was similar to the sample demographics of the 2000 Census for individuals 14-18 years of age.

Permission to conduct the survey was obtained from each high school interested in participating. In some instances, a presentation to the School Board of certain schools was required. These presentations outlined the study and its procedures to the members of the School Board. After securing permission from the schools, a passive consent procedure was used to obtain parental permission. Letters were mailed to parents outlining the study, and those who did not want their child participating in the study were asked to contact the school directly. If no contact was made, then parental consent was assumed. Students were informed that participation was voluntary and were not penalized for not participating. The Human Investigation Committee at the Yale School of Medicine approved all survey protocols.

Each participating school was scheduled for one day of data collection wherein researchers were sent to these schools to distribute the survey and ensure proper study procedures. The survey was either given to the entire school body in a single assembly or given throughout the day in English classes. Students were given pens to use and keep for completing the questionnaires.

Alcohol-drinking-frequency categorization

Based on the frequency of drinking reported by students, participants were divided into two groups: a LFD and a HFD group. These categories were determined by responses to the question: "During the past 30 days, on how many days did you have at least one whole drink of alcohol?" The LFD group consisted of those who reported no consumption of alcohol in the past 30 days or at least one drink between 1-5 days in the last month. The HFD group included those who reported at least one drink between 6-30 days in the last month. Given the categorical data collected, this threshold of alcohol consumption approximates LFD groups examined in prior studies of adolescent drinking and gambling^{30,40}.

Gambling characteristics

Gambling groups were based on items from the Massachusetts Gambling Screen, a validated instrument designed to assess gambling problems in adolescents⁴¹. Questions assessing the 10 DSM-IV criteria for pathological gambling were used to categorize individuals as described previously. Individuals who indicated no gambling activity were categorized as non-gambling (NG). Others were categorized as either low-risk gambling (LRG; individuals who reported past-year gambling but did not meet any DSM-IV criteria) or at-risk/problem gambling (ARPG; individuals who met one or more DSM-IV criteria), as in our prior studies^{10,24,38,39}. Participants were instructed to consider gambling as “any game you bet on for money OR anything else of value.” Gambling-related attitudes and perceptions are identical to those described in prior studies^{24,42}. The question asking, “When you gamble, with whom do you usually gamble? Check ALL that apply,” was used to interrogate gambling partners, as has been done previously^{10,24,38,39}.

Data analysis

A total of 1842 adolescents provided valid data for drinking frequency and responses to all questions assessing DSM-IV inclusionary criteria for pathological gambling and thus were included in analyses. Analyses of gambling characteristics and behaviors were restricted to the 1609 adolescents reporting gambling participation from the sample of 1842 adolescents. All data were double-entered, reviewed to ensure within-range values, and randomly spot-checked to verify accuracy. Statistical analysis was conducted using SAS software (Cary, NC). We first examined the unadjusted association between problem-gambling severity and drinking frequency; statistical significance was determined with two-tailed, Pearson chi-square tests. We then examined unadjusted associations between problem-gambling severity and demographic characteristics, stratified according to drinking frequency. We also examined unadjusted associations between alcohol-drinking frequency and attitudes toward gambling in bivariate analyses. To produce odds ratios (ORs) and 95% confidence intervals (95% CIs) as a measure of the magnitude of the association between problem-gambling severity and our dependent variables of interest (those relating to gambling partners), we utilized logistic regression models for binary outcomes, stratified according to drinking frequency. All models were adjusted for age, race, gender, and household structure. Statistical significance was set at $p < 0.05$. Interaction odds ratios tested the extent to which odds ratios between problem-gambling severity (ARPG, LRG) and gambling partner measures (yes, no) were statistically significantly different in the two drinking groups (HFD, LFD).

RESULTS

Demographics

Of the study sample, 72% ($n=1327$) were classified in the LFD group and 28% ($n=515$) in the HFD group (Table 1). In bivariate analysis, problem-gambling severity was associated with drinking frequency ($\chi^2(1, N=1842)=49.22, p<.0001$), with greater problem-gambling severity observed among HFD (ARPG=41%, LRG=52%, NG=6%) compared to LFD (ARPG=27%, LRG=58%, NG=15%) adolescents. Full demographic information is presented in Table 1.

Alcohol-related attitudes and behaviors across gambling groups—Alcohol-related attitudes and behaviors among adolescents stratified by problem-gambling severity were examined using bivariate analyses (Table 2). Individuals with greater problem-gambling severity appeared more likely to begin drinking regularly at an earlier age ($\chi^2(1, N=1842)=87.43, p<.0001$), have consumed 5 or more drinks within a few hours ($\chi^2(1, N=1842)=63.36, p<.0001$), indicate having an alcohol problem ($\chi^2(1, N=1842)=44.1, p<.0001$), and report having parents who approved of alcohol use ($\chi^2(1, N=1842)=31.58, p<.0001$).

Gambling-related attitudes and behaviors across HFD and LFD groups—Gambling-related attitudes and behaviors among adolescents stratified by frequency of drinking were examined using bivariate analyses (Table 3). HFD and LFD youth differed on reports of adults at school discussing their own gambling, teachers presenting risks of gambling, consequences of gambling at school, parental perception of gambling, and importance of multiple possible interventions that might influence gambling in teenagers (Table 3). In general, HFD versus LFD adolescents were more likely to report having experienced adults at school discussing gambling, having teachers on multiple occasions discuss risks of gambling, knowing the consequences of gambling at school (with more reporting no consequences), having parents who approve of gambling and seeing multiple possible interventions targeting teenage gambling as not important (Table 3).

Gambling partners across drinking and gambling groups—The relationships between problem-gambling severity and gambling partners stratified by alcohol-drinking-frequency groups are presented in Table 4. Within the LFD group, elevated odds were observed between ARPG (versus LRG) and gambling with family members (OR = 1.51, 95% CI = [1.15, 1.99]), friends (OR = 2.12, 95% CI = [1.50, 3.00]), or with strangers (OR = 5.43, 95% CI = [2.98, 9.90]). Within the HFD group, elevated odds were observed between ARPG and gambling with adults (OR = 3.18, 95% CI = [1.98, 5.09]) or strangers (OR = 4.74, 95% CI = [2.42, 9.28]). The interaction term between the HFD and LFD groups was significant for gambling with adults, indicating a stronger association between ARPG and gambling with adults among HFD individuals as compared to LFD ones (Interaction OR = 1.78, 95% CI = [1.05, 3.02]).

DISCUSSION

Summary

In general, our hypotheses were largely supported. Consistent with our first hypothesis, ARPG and HFD were associated. When stratified by problem-gambling severity, ARPG adolescents appeared more likely to report parental approval for alcohol use. Our hypotheses regarding HFD and gambling-related perceptions and experiences involving adults or adult-related interventions were also supported. HFD individuals were more likely to report adult- and parent-initiated gambling-related prevention efforts as not important. Lastly, our hypothesis that problem-gambling severity would be more closely related to gambling with adults and family members appeared partially supported; a significant interaction was observed for gambling with adults, but not specific to gambling with family members. The

results suggest potential areas for prevention efforts to target to reduce adolescent gambling and drinking.

Gambling behaviors as related to drinking frequency

Results from this study indicate more frequent ARPG among HFD adolescents, consistent with prior studies^{2,30,40}. Given that HFD-ARPG individuals may be more likely to seek treatment when available³⁰, early identification is important. This process may be facilitated through parents and teachers making students aware of treatment programs in a nonjudgmental fashion^{43,44}.

Gambling and alcohol attitudes with suggestions for prevention strategies

When specific gambling attitudes were examined, HFD adolescents were more likely than LFD adolescents to indicate parental approval of gambling. This follows prior results reported from this survey that perceived parental permissiveness toward gambling, in different models focused on interactions with impulsivity and sensation seeking, related to more frequent alcohol use and other addictive behaviors²⁵. Moreover, HFD adolescents were more likely than LFD adolescents to consider peer-, adult- and parent-administered gambling prevention efforts as not important. When the sample was stratified by gambling group and asked about alcohol-use characteristics, APRG individuals indicated earlier ages of drinking, more alcohol consumed, and greater parental approval of alcohol use. These results, when taken with the current finding of significant adult involvement in HFD adolescent gamblers, indicate that prevention and awareness strategies for adults, especially parents, may require intensification. Indeed, the relatively permissive or indifferent parental attitudes reported by HFD youth in this study suggest that parental communication and monitoring of at-risk adolescents may play a role in developing problematic risky behaviors relating to alcohol and gambling. Studies show that gambling may be perceived as “less harmful” by many youths and adults, which could relate to these adolescents witnessing their parents participating in and promoting gambling activities^{22,45}. It is conceivable that poor communication between parents and adolescents regarding the risks of gambling could diminish the perceived risk of gambling while lack of communication might even be perceived as permissive. Therefore, interventions that target adults who may be encouraging gambling and drinking behaviors in adolescents, whether intentionally or unintentionally, seem important. Prevention strategies focusing on increasing adult awareness of gambling and drinking in youths may be one important approach that requires further investigation and development. Fortunately, parent-based interventions have shown efficacy in reducing alcohol use among late adolescents (i.e., first-year undergraduates)⁴⁶ and should be extended to other addictive and risky behaviors.

In addition to associations between perceived parental attitudes toward gambling and HFD, relationships were observed between measures relating to gambling at school and HFD. For example, HFD (versus LFD) adolescents were more likely to report hearing about gambling-related risks from their teachers than LFD adolescents. Additionally, HFD adolescents were more likely to report knowing about the consequences of gambling at school. These findings raise the possibilities that HFD individuals may have been more likely to have been caught gambling at school and/or may be more likely to attend to gambling-related information.

While not investigated here, future studies could examine how conveying gambling risks and consequences might affect gambling behavior in HFD adolescents. These findings highlight the need to better understand the relationship between the school environment and gambling behaviors in HFD adolescents, particularly as it concerns the teacher-student relationship.

Drinking status moderated the relationship between ARPG and gambling with adults, with a stronger relationship observed in the HFD group. Although it is still unclear which adults may have been gambling with the adolescents (e.g., whether these adults were parents or other adults), it should be noted that adolescents with parents who encourage gambling behavior are more likely to engage in gambling and experience more gambling related problems²⁶⁻²⁹. While the language of the survey did not specifically examine parental involvement, an important direction for future studies will be to examine the role of parents, other adults, older siblings and potential role-models on adolescent gambling and its interaction with HFD. Combined with the findings that HFD adolescents are more likely to report hearing adults discuss their gambling at school on a daily basis, there is a possibility HFD adolescents are gambling with adults at school. However, as this study did not investigate the context of these conversations, an alternate possibility might be that HFD adolescents attend to gambling related cues more than their LFD peers, consistent with work suggesting attentional biases in addictions and their relevance to behavioral changes^{47,48}. In either case, a more precise understanding of the relationship between HFD and ARPG in adolescents and the adults with whom they gamble would allow clinicians to better tailor prevention and treatment efforts for these adolescents, as well as for the adults involved.

Strengths and limitations

This study represents one of the first examining drinking frequency in conjunction with gambling behaviors in adolescents and relationships with attitudes, behaviors, and parental perceptions. This study utilized a large, ecologically valid sample of Connecticut high-school students. Results could be used to devise more efficient prevention strategies which could help curtail adolescent problem gambling and drinking.

There exist limitations to this study. First, the sample was not random. Second, individuals who did not complete the full questionnaire were not included in analysis, which may create a biased sample. Third, the data collected were based on student recall, which is subject to potential biases and inaccuracies. While studies have shown that adolescent perceptions of parental attitudes correlate with risky behaviors more than parental perceptions, some studies have indicated that adolescent perceptions of parental attitudes may differ more than actual attitudes^{22,49}. In either case, future studies could benefit from both direct parental queries and adolescent perceptions²². Fourth, the cross-sectional design limits the ability to observe how variables may change throughout adolescents and into adulthood, or from childhood to adolescence. They also do not permit causal inferences to be made (for example, whether alcohol drinking leads to problem gambling, problem gambling to greater alcohol consumption or a common factor, like impulsivity, may lead to both). Longitudinal studies using a similar survey presented here could better elaborate on temporally relevant aspects of problem-gambling severity development with respect to drinking behaviors and

investigate potential causal relationships. Fifth, no analyses were performed controlling for school location as related to the investigated variables (e.g. parental perceptions). It is possible that regional variation exists with respect to adolescent perceptions. Future studies should investigate factors (relating to geographic region or specific factors associated with these regions – e.g. socioeconomic status) might influence adolescent risk behaviors and adolescent perceptions regarding prevention interventions and parental and adult behaviors. Sixth, while the study questionnaire does specify different groups (i.e. peers, adults, parents, and teacher), there were no strict definitions provided for what might constitute an “adult.” Thus, it is possible that some respondents may have considered peers 18 years or older being considered as being adults and others may not. Future studies could include specific definitions to avoid such potential confusion. Seventh, given differences between alcohol and gambling (e.g., the significant impact of binge alcohol consumption on judgment and risk behaviors, whereas binge gambling is of more questionable relevance), specific items relating to gambling and alcohol consumption were assessed, with specific questions based on clinically relevant features in each domain, the aims of the parent survey and the limitations imposed by subject burden. Future studies might include a broader range of alcohol and gambling measures with questions that are more parallel across domains. Finally, given the on-site nature and large scale of the original study, some questionnaires were not fully completed and have lead to missing data in our analyses. While a majority of the categories had 10% or less missing data, “current age” had 24% missing data. Given high correlations between age and grade level and given the missing data on age, grade level was used in adjusted analyses. Future studies should nonetheless ensure a more complete response to all questions being posed.

Conclusions

HFD and ARPG may interact on multiple levels. Coupled with findings that show increased likelihood of parental approval of gambling among HFD individuals and more ambivalent attitudes towards adult/parent focused awareness methods, these results draw attention to the need for improved prevention strategies. Specifically, strategies that aim to not only educate students, but also parents and adults on the harms of adolescent gambling may represent an important approach to gambling prevention in youth.

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TABLE 1

Demographic characteristics by alcohol-drinking frequency and problem-gambling severity (n=1842)

Variables	Low Frequency/Nondrinking (n = 1327)			χ^2	High Frequency Drinking (n = 515)			χ^2
	NG (n = 200)	LRG (n = 772)	ARPG (n = 355)		NG (n = 33)	LRG (n = 270)	ARPG (n = 212)	
	n (%)	n (%)	n (%)		n (%)	n (%)	n (%)	
Gender				110.08**				67.23**
Boys	61 (31)	382 (49.9)	263 (75.1)		11 (34.4)	124 (46.8)	169 (81.2)	
Girls	136 (69)	383 (50.1)	87 (24.9)		21 (65.6)	141 (53.2)	39 (18.8)	
Race/Ethnicity				7.16				16.9**
African American								
Yes	23 (11.5)	79 (10.2)	56 (15.8)		0 (0)	12 (4.4)	29 (13.7)	
No	177 (88.5)	693 (89.8)	299 (84.2)		33 (100)	258 (95.6)	183 (86.3)	
Caucasian				9.75**				7.29
Yes	133 (66.5)	579 (75)	240 (67.6)		28 (84.9)	218 (80.7)	151 (71.2)	
No	67 (33.5)	193 (25)	115 (32.4)		5 (15.2)	52 (19.3)	61 (28.8)	
Asian				0.72				5.84
Yes	9 (4.5)	28 (3.6)	11 (3.1)		0 (0)	13 (4.8)	19 (9)	
No	191 (95.5)	744 (96.4)	344 (96.9)		33 (100)	257 (95.2)	193 (91)	
Other				4.30				.7630
Yes	43 (21.5)	121 (15.7)	66 (18.6)		3 (9.1)	39 (14.4)	28 (13.2)	
No	157 (78.5)	651 (84.3)	289 (81.4)		30 (90.9)	231 (85.6)	184 (86.8)	
Hispanic				5.34				6.22
Yes	39 (20.5)	105 (14.1)	59 (17.4)		3 (9.7)	36 (14)	44 (21.9)	
No	151 (79.5)	639 (85.9)	281 (82.6)		28 (90.3)	221 (86)	157 (78.1)	
Grade				15.1				19.3*
9	47 (23.5)	214 (27.8)	115 (32.4)		1 (3.1)	49 (18.2)	59 (28)	
10	41 (20.5)	198 (25.7)	99 (27.9)		7 (21.9)	70 (26)	51 (24.2)	
11	72 (36)	223 (29)	82 (23.1)		17 (53.1)	86 (32)	51 (24.2)	
12	40 (20)	135 (17.5)	59 (16.6)		7 (21.9)	64 (23.8)	50 (23.7)	
Family Structure				7.80				7.14
1 parent	49 (24.9)	189 (24.8)	73 (21.1)		10 (31.3)	73 (27.4)	50 (24.5)	
2 parents	135 (68.5)	537 (70.5)	243 (70.2)		17 (53.1)	176 (66.2)	129 (63.2)	
Other	13 (6.6)	36 (4.7)	30 (8.7)		5 (15.6)	17 (6.4)	25 (12.3)	
Current Age				10.51				5.58
14	15 (10.3)	93 (15.8)	42 (15.2)		0 (0)	14 (7.3)	21 (13)	
15-17	98 (67.1)	420 (71.4)	195 (70.4)		13 (72.2)	131 (67.9)	105 (65.2)	
18+	33 (22.6)	75 (12.8)	40 (14.4)		5 (27.8)	48 (24.9)	35 (21.7)	

NG = Non-Gamblers; LRG = Low-Risk Gamblers; ARPG = At-Risk and Problem/ Pathological Gamblers

*
 $P < 0.01$

**
 $P < 0.001$

TABLE 2

Alcohol-related measures in adolescents stratified by problem-gambling severity (n=1842)

	NG (n =233)	LRG (n = 1042)	ARPG (n = 567)	
Variables	n (%)	n (%)	n (%)	
Age at first drink of alcohol (more than a sip)				87.43**
Never had a drink of alcohol other than a few sips	35 (15.7)	74 (7.3)	43 (7.6)	
8	10 (4.5)	41 (4)	75 (13.3)	
9-10	9 (4)	51 (5)	42 (7.5)	
11-12	27 (10.5)	148 (15.6)	83 (14.7)	
13-14	63 (28.3)	399 (39.2)	177 (31.4)	
15-16	63 (28.3)	263 (25.9)	120 (21.3)	
17	16 (7.2)	41 (4)	23 (4.1)	
Days consumed 5 or more drinks of alcohol in a row, within a couple of hours (past 30 days)				63.36**
0	149 (67.1)	576 (56.3)	238 (43.2)	
1-2	32 (14.4)	203 (19.8)	110 (20)	
3-5	17 (7.7)	112 (10.9)	71 (12.9)	
6-9	12 (5.4)	68 (6.6)	51 (9.3)	
10-30	12 (5.4)	65 (6.4)	81 (14.7)	
Have or had an alcohol problem				44.1**
Yes	15 (6.9)	62 (6.1)	88 (16)	
No	204 (93.1)	961 (93.9)	461 (84)	
Anyone in the family ever have alcohol problem				3.89
Yes	95 (43)	513 (50.2)	272 (49.9)	
No	126 (57)	510 (49.8)	273 (50.1)	
Parent perception about alcohol use				31.58**
Disapprove	142 (68.3)	630 (62.3)	321 (60.2)	
Neither approve nor disapprove	50 (24)	328 (32.4)	145 (27.2)	
Approve	16 (7.7)	53 (5.2)	67 (12.6)	

P < 0.01

NG = Non-Gamblers; LRG = Low-Risk Gamblers; ARPG = At-Risk and Problem/ Pathological Gamblers

**
P < 0.001

TABLE 3

Gambling-related perceptions and behaviors in HFD and LFD adolescents (n=1842)

Variables	Low-frequency/non-drinking (n = 1327)		High-frequency drinking (n = 515)		χ^2
	Total	%	Total	%	
Age of Gambling Onset					27.6303**
8 years old	105	11.72	92	22.06	
9-11 years old	146	16.29	73	17.51	
12-14 years old	348	38.84	124	29.74	
15 years old	297	33.15	128	30.70	
Once or twice per day	29	2.5	43	9.7	
Parent perception about gambling					48.92***
Disapprove	462	41.5	118	27.8	
Neither approve nor disapprove	559	50.2	225	52.9	
Approve	92	8.3	82	19.3	
Adults at school discuss their own gambling					58.80***
Never	669	57.3	192	43.3	
A few times a year	332	28.4	129	29.1	
Once or twice per month	82	7.0	42	9.5	
Once or twice per week	56	4.8	37	8.4	
Once or twice per day	29	2.5	43	9.7	
Teacher presented information about problem gambling/gambling risks					19.40*
Never	579	49.5	215	48.0	
Once	186	15.9	77	17.2	
2-3 times	272	23.3	76	17.0	
4-6 times	64	5.5	31	6.9	
7-9 times	22	1.9	15	3.4	
10+ times	46	3.9	34	7.8	
Consequences for first time gambling at school					35.57***
Nothing	79	6.9	69	15.4	
Warning from teacher or principal	229	19.8	74	16.5	
Detention	102	8.8	47	10.5	
Suspension	181	15.7	72	16.1	
Expulsion	12	1.0	9	2.0	
Don't know	551	47.8	177	39.5	
Importance for preventing gambling problems in teens					
<i>Checking identification for purchasing lottery tickets</i>					36.41***
Important	1007	81.7	331	68.3	
Not important	226	18.3	154	31.8	

Variables	Low-frequency/non-drinking (<i>n</i> = 1327)		High-frequency drinking (<i>n</i> = 515)		χ^2
	Total	%	Total	%	
<i>Hanging out with friends who don't gamble</i>					25.93 ***
Important	899	73.1	289	60.5	
Not important	331	26.9	189	39.5	
<i>Participating in activities that are fun and free of gambling</i>					25.24 ***
Important	994	80.9	332	69.6	
Not important	235	19.1	145	30.4	
<i>Fear of losing valuable possessions, close friends, and relatives</i>					25.23 ***
Important	1081	88	375	78.5	
Not important	147	12	103	21.5	
<i>Advertisements that show the problems associated with gambling</i>					15.97 ***
Important	922	75.8	315	66.2	
Not important	295	24.2	161	33.8	
<i>Not having access to Internet gambling at home</i>					3.25
Important	768	63.1	277	58.3	
Not important	450	36.9	198	41.7	
<i>Parent/Guardian strictness about gambling</i>					22.15 ***
Important	963	79	325	68.1	
Not important	256	21	152	31.9	
<i>Warnings from adults in family</i>					19.88 ***
Important	964	79.2	329	69	
Not important	253	20.8	148	31	
<i>Warnings from, or listening to, peers</i>					21.63 ***
Important	975	80.5	334	70	
Not important	236	19.5	143	30	
<i>Having parents who don't gamble</i>					27.12 ***
Important	951	78.1	313	65.9	
Not important	266	21.9	162	34.1	
<i>Learning about the risks of gambling in school</i>					16.52 ***
Important	917	75.3	311	65.5	
Not important	301	24.7	164	34.5	
<i>Learning about the risks of gambling from parents</i>					29.9 ***
Important	983	80.9	327	68.6	
Not important	232	19.1	150	31.5	
<i>Learning about the risks of gambling from peers</i>					20.11 ***
Important	943	77.6	321	67	
Not important	273	22.4	158	33	

Variables	Low-frequency/non-drinking (<i>n</i> = 1327)		High-frequency drinking (<i>n</i> = 515)		χ^2
	Total	%	Total	%	
<i>Adults not involving kids in gambling</i>					23.1***
Important	981	80.9	335	70.1	
Not important	232	19.1	143	29.2	
<i>Parent/Guardian not permitting card games (for money) at home</i>					2.51
Important	755	62.3	279	58.1	
Not important	457	37.7	201	41.9	
Family concern					2.49
Yes	157	13.1	75	16	
No	1046	86.9	393	84	

* $P < 0.01$

** $P < 0.001$

*** $P < 0.0001$

TABLE 4

Regression Model Examining for Moderating Effects of Drinking Frequency on Relationships Between ARPG and Gambling Partners (n=1609)

	Low-frequency/ non-drinking		High-frequency drinking		Interaction O.R.	
	ARPG vs. LRG		ARPG vs. LRG		HFD vs. LFD	
	O.R.	95 % CI	O.R.	95 % CI	O.R.	95 % CI
Gambling Partners						
Gamble with Adults – yes	1.87	0.61-2.69	3.18	1.98-5.09	1.78	1.05-3.02
Gamble with Family – yes	1.51	1.15-1.99	1.31	0.86-2.00	0.93	0.58-1.48
Gamble with Friends – yes	2.12	1.50-3.00	0.71	0.42-1.22	0.33	0.19-0.59
Gamble with Strangers – yes	5.43	2.98-9.90	4.74	2.42-9.28	0.82	0.35-1.90

Odds-ratios adjusted for socio-demographic differences in gender, race/ethnicity, grade level and familial structure.

LRG = low-risk gamblers; ARPG = At-Risk and Problem/ Pathological Gamblers

LFD = low-frequency/non-drinking; HFD = high-frequency drinking