Trends in gambling behavior among college student-athletes: A comparison of 2004, 2008, 2012 and 2016 NCAA survey data

Jérémie Richard,¹ Thomas S. Paskus,² & Jeffrey L. Derevensky¹

²National Collegiate Athletics Association, Indianapolis, IN, United States

Abstract

Student-athletes represent a vulnerable subgroup of the college student population with regards to engagement in high-risk behaviours. Four large samples of National Collegiate Athletic Association (NCAA) student-athletes in 2004 (N = 20,587), 2008 (N = 19.942), 2012 (N = 22.935) and 2016 (N = 22.388) were surveyed about their gambling behaviours and attitudes. A cross-sectional study was conducted to gain insight into changing gambling behaviours and attitudes among college studentathletes. Findings revealed gender differences in participation rates of gambling with men consistently engaging in all gambling activities at higher rates than women (55%)of men versus 38% women in 2016). Despite gender differences, the results suggest that participation rates for most gambling activities have generally decreased over the twelve-year span. The proportion of student-athletes at-risk or meeting criteria for pathological gambling between 2004 and 2016 has also decreased among men (4% in 2004 versus 2% in 2016) while remaining relatively consistent among women (<1% across all years). Furthermore, attitudes towards various forms of gambling appear to have changed over time, with a greater number of student-athletes in 2016 believing that sports wagering is unacceptable and a potentially harmful activity. Taken together, the results suggest that gambling behaviours among student-athletes may be on a downward trend despite the increased accessibility and availability of gambling opportunities.

Keywords: Gambling, problem gambling, college student-athletes, gender

Résumé

En ce qui concerne la participation à des comportements à risque élevé, les étudiantsathlètes représentent un sous-groupe vulnérable de la population des étudiants universitaires. Quatre grands échantillons d'étudiants-athlètes de la National Collegiate Athletic Association (NCAA), 2004 (N = 20 587), 2008 (N = 19 942), 2012 (N = 22 935) et 2016 (N = 22 388), ont été sondés sur leurs comportements et

¹ International Centre for Youth Gambling Problems and High Risk Behaviors, McGill University, Montreal, QC, Canada

leurs attitudes de jeu. Une étude transversale a été menée afin de mieux comprendre l'évolution des comportements et des attitudes face au jeu chez les étudiants athlètes. Les résultats ont révélé des différences entre les sexes dans les taux de participation au jeu, les hommes pratiquant systématiquement toutes les activités de jeu à un taux plus élevé que celui des femmes (55 % d'hommes contre 38 % de femmes en 2016). Malgré les différences entre les sexes, les résultats laissent entendre que les taux de participation à la plupart des activités de jeu ont généralement diminué au cours de la période de douze ans. La proportion d'étudiants-athlètes à risque ou satisfaisant aux critères du jeu pathologique entre 2004 et 2016 a également chuté chez les hommes (4 % en 2004 contre 2 % en 2016), tout en restant relativement stable chez les femmes (<1 % pour toutes les années). En outre, les attitudes vis-à-vis des différentes formes de jeu semblent avoir évolué au fil du temps. En 2016, un plus grand nombre d'étudiants-athlètes pensaient que les paris sportifs étaient inacceptables et potentiellement nocifs. Mis ensemble, les résultats suggèrent que les comportements de jeu parmi les étudiants-athlètes pourraient être à la baisse, en dépit de l'accessibilité accrue et de la disponibilité des possibilités de jeu.

Introduction

College students represent one of the largest groups of young adults in the United States (Vespa, 2017), with over 20 million individuals attending colleges or universities in 2017 (National Centre for Education Statistics, 2018). Such students have been reported to engage in a wide range of risky behaviours, including heavy episodic or binge drinking, illicit drug use, cigarette smoking, and gambling (LaBrie, Shaffer, LaPlante, & Wechsler, H., 2003; Laska et al., 2009; Laska, Pasch, Lust, Story, & Ehlinger, 2009; Mohler-Kio, Lee & Wechsler, 2003; Nowak, 2017a; Wechsler, Lee, Kuo, Seibring, Nelson, & Lee, 2002; Weinstock, Whelan, Meyers, & McCausland, 2007). Student-athletes, representing 4% to 25% of the collegiate student body at National Collegiate Athletics Association (NCAA) affiliated institutions (National Collegiate Association, 2018), have also been reported to engage in the above-mentioned risky behaviours (Ellenbogen, Jacobs, Derevensky, Gupta, & Paskus, 2008; Huang, Jacobs, Derevensky, Gupta, & Paskus, 2007a; Huang, Jacobs, & Merensky, 2010; 2011; Weiss, 2010). Estimates suggest that 75% to 80% of college students have gambled within the last year (Barnes, Welte, Hoffman, & Tidwell, 2010; Blinn-Pike, Worthy, & Jonkman, 2007; Lostutter, Lewis, Cronce, Neighbors, & Larimer, 2014), with 6% of college students being identified as pathological gamblers and an additional 10% as problem gamblers (i.e., not yet reaching the clinical criteria for disordered gambler) (Nowak, 2017a). Rates of problem or pathological gambling are similar among student-athletes, ranging from 3% to 15% (Ellenbogen et al., 2008; Engwall, Hunter, & Steinberg, 2004; Huang, Jacobs, Derevensky, Gupta, & Paskus, 2007b).

College students experiencing problems with gambling have been reported to have a substantially decreased academic performance, engage in socially isolating behaviours, experience difficulties in social relationships, and are at heightened risk of suicidal ideation and attempts (Bischof et al., 2015; Black et al., 2015; Petry & Weinstock, 2007; Stinchfield, Hanson, & Olson, 2006). Additional harms associated with problem gambling include mental health symptoms such as anxiety and depression (Martin, Usdan, Cremeens, & Vail-Smith, 2014; Quigley et al., 2015), substance abuse, familial concerns, and financial hardships (Brezing et al., 2010; Neighbors et al., 2015). In addition to the previously mentioned risks, studentathletes may experience further consequences as a result of gambling. NCAA regulations prohibit student-athletes from betting money on any sporting event, with violations of this regulation resulting in an athlete possibly losing his or her athletic eligibility and being subject to other penalties. Furthermore, a concern for the NCAA is the risk of devaluing the integrity of intercollegiate sports by athletes trying to influence the outcome of a game (e.g., match fixing, point-shaving). With significant personal safety issues being associated with placing bets with bookmakers (McComb & Hanson, 2009) and the potential for pernicious gambling scandals (Figone, 2012), it is important to examine gambling-related behaviours among college student athletes.

Reported prevalence rates of past year gambling and problem gambling among college student-athletes have fluctuated over time. To gain insight into studentathlete engagement in gambling activities, the NCAA has been administering surveys to a representative sample of college student-athletes every four years beginning in 2004. Based on the comparable data from the first three surveys (2004, 2008 and 2012), rates of past year and weekly gambling have diminished over time (Sansanwal, Derevensky, & Paskus, 2018; Shead, Derevensky, & Paskus, 2014). Furthermore, the proportion of student-athletes in the combined group of at-risk and probable pathological gamblers also decreased over time among men (4.0% in 2004, 3.8% in 2008, 1.9% in 2012) while remaining constant among women (<1% across all years). Among the different NCAA sports, golfers have been identified as the group of athletes with the highest rates of past year gambling, weekly gambling, and the highest rates of at-risk or probable pathological gambling behaviours. Sansanwal, Derevensky, and Paskus (2018) also found that knowledge and information regarding NCAA policies varied by Division, with Division I athletes receiving more information than their Division II and III counterparts.¹ A comparison of the 2004, 2008, 2012 and the most recent 2016 data could inform researchers on current trends and whether prevalence rates of gambling behaviours are still decreasing.

¹Division I is the highest level of intercollegiate athletics, one which has a larger budget, more elaborate facilities, a greater number of athletic scholarships (Division III athletes do not receive financial aid) and which tends to see more athletes going into the professional rank than Division II and Division III institutions. Division I athletes enjoy a higher number of contests during the year, and are expected to maintain a higher grade point average in their academic courses. What is more, their games are more often televised than those in Divisions II and III.

Various social and environmental factors influence the gambling behaviours of college student-athletes (LaPlante & Shaffer, 2007; Shaffer, LaBrie, & LaPlante, 2004; St.-Pierre, Walker, Derevensky, & Gupta, 2014). As engagement in gambling is becoming increasingly normalized and liberalized, changing perceptions regarding the acceptability of gambling could be influencing rates of gambling participation. Presently, only a limited number of states (e.g., Hawaii and Utah) legally prohibit all forms of gambling (Gambling Law US, 2017), while gambling is generally perceived as a socially acceptable form of entertainment in other states. With the ruling of Murphy v. National Collegiate Athletic Association (NCAA) (Murphy v National Collegiate Athletic Association, 2018) allowing for legalized state-sponsored sports betting, clear attempts are being made on a political level to authorize multiple forms of gambling throughout the US. The liberalization of gambling-related regulation can potentially lead young adults to have more permissive and accepting attitudes towards gambling and could increase the likelihood of gambling participation (Salonen, Kontto, Perhoniemi, Alho, & Castrén, 2018).

Of note, college student-athletes may be particularly susceptible to engagement in sport-related gambling behaviours with wagering on sports being one of the most popular forms of gambling in this population (Huang et al., 2007b; Martin, Nelson, & Gallucci, 2016). In addition to betting on individual sporting events, seasonal and daily fantasy sports leagues are becoming increasingly popular. With the integration of fantasy sports online wagering platforms and mobile applications, individuals can now place bets and side wagers on a regular basis. Recent figures from the Fantasy Sports Trade Association (FSTA, 2018) estimate that 57.4 million people participated in fantasy sports in the US and Canada while the percentage of players who participated in daily fantasy sports increased from 31% in 2012 to 64% in 2015. As wagering on sports is becoming increasingly popular, especially among studentathletes, this raises the potential for harm in this population. In a study of collegestudent athletes. Marchica and Derevensky (2015) reported that among fantasy sport players, 48% of men and 25% of women were categorized as at-risk/PPGs. Additionally, daily fantasy players reportedly gamble more frequently than those not playing daily fantasy, while having a greater number of comorbid psychological problems (Nower, Caler, Pickering, & Blaszczynski, 2018). Given these findings, sports wagering and fantasy sports may be rendering college student-athletes at an even greater risk of problem gambling and its associated consequences.

Although opportunities for gambling have increased dramatically, there has been a downward trend in gambling participation among NCAA college student-athletes from 2004 to 2012 (Sansanwal, Derevensky and Paskus, 2018). Such findings are contrary to the availability or total consumption theory (Abbott, 2006; Edwards et al., 1995; Lund, 2008), which predict that increased availability will lead to increased consumption and a higher proportion of heavy users and associated problems. Instead, these findings are consistent with an alternate explanation proposed by Shaffer (2005), the adaptation hypothesis. The adaptation hypothesis predicts a plateauing of gambling participation and a reduction in problem gambling rates among populations exposed to gambling for extended periods of time (Abbott, 2006;

Public Health Agency of Sweden, 2016; Shaffer & Martin, 2011; Williams, Volberg, & Stevens, 2012). It is possible that as gambling becomes more accessible, college student-athletes may perceive gambling as something less novel and exciting, and as a result, will gamble less frequently while also experiencing lower rates of problems gambling.

The purpose of the present study is to compare the results of the 2004, 2008, 2012 and 2016 NCAA national gambling surveys. Given the significant changes in the availability and accessibility of gambling since 2012 and the increase in the number of people participating in daily fantasy, an updated investigation of student-athlete participation in gambling is necessary. Although preliminary findings comparing these results are represented in an NCAA report (National Collegiate Athletic Association, 2017), this study provides further context and detail to the original report while examining changing trends in overall gambling participation, problem gambling, origins of gambling behaviours and attitudes towards sports wagering behaviours. Results will investigate rates of gambling behaviours by gender, sport played and NCAA Division. While this represents a cross-sectional study, a comparison of these findings will provide insight into how the engagement in various gambling activities and attitudes towards sports wagering have changed over this twelve-year period.

Method

Participants and Procedure

Participants were drawn from the NCAA National Study on Collegiate Wagering, a self-report survey assessing gambling behaviours among US college student-athletes. Prior to data collection, ethical approval was obtained from the NCAA Research Committee and NCAA Research Review Board and from the ethics committees of respective institutions where the surveys were administered. A total of 20,587 valid surveys were administered in 2004, 19,942 in 2008, 22,935 in 2012, and 23,533 in 2016. Demographic characteristics of the sample from each year are presented in Table 1.

A stratified random sampling protocol was incorporated to select teams for participation and to obtain a sufficiently large and representative sample of NCAA student-athletes from all three Divisions and 22 sports. All 1,000 + member colleges of the NCAA were invited to participate with one to three athletic teams within each school being asked to complete the survey. As the study methods guarantee the anonymity of responding student-athletes, their teams and schools, no data are available on an institutional level (i.e., school, school region, school size, response rate). Nevertheless, the school-level response rate was estimated to be greater than 60% based on similar non-anonymized surveys previously conducted by the NCAA using the same methods. Once institutions were identified and sports teams were selected for those schools, faculty athletics representatives (FARs) at each member institution were contacted to assist with survey administration. Each FAR was

Variable	2004 (%)	2008 (%)	2012 (%)	2016 (%)	
Gender					
Men	62	62	57 _a	61 _c	
Women	38	38	43 _a	$39_{\rm c}$	
Race/Ethnicity					
White	75	72 _a	77 _{ab}	70_{abc}	
Black	15	17 [°] a	15 _b	14 _b	
Other	10	11	8 _{ab}	16_{abc}	
Academic Year					
Freshman	33	35 _a	32_{ab}	32_{b}	
Sophomore	26	27	27	27	
Junior	23	23	25 _{ab}	26_{ab}	
Senior	19	15 _a	16_a	15 _a	

Table 1Demographic characteristics of the samples of college student-athletes

Note. 2x2 Pearson chi-square tests (df = 1) compared the 2004, 2008, 2012 and 2016 sampling distributions of respondents. a = significantly different from 2004 at p < 0.001; b = significantly different from 2008 at p < 0.001; c = significantly different from 2012 at p < 0.001; d = significantly different from 2016 at p < 0.001.

provided with a detailed and specific protocol to follow and a script to read, which emphasized the voluntary and anonymous nature of the survey. The surveys were group-administered to all student-athletes aged 18 years or older of a sampled team without coaches or other team personnel present. Following completion, one student was assigned the responsibility of collecting the completed surveys, placing them in a sealed envelope, and mailing the pre-addressed, pre-paid envelope to an independent third-party vendor that compiled and entered the data.

Measures

The 2004, 2008, 2012 and 2016 surveys differed slightly in content. Whereas the 2004 survey collected information on multiple health-risk behaviours (i.e., substance use, sexual activity, criminal activity) in addition to gambling behaviours, the 2008, 2012 and 2016 surveys were instead modified to have a greater focus on gambling behaviours. In all four surveys, student-athletes provided demographic information, and indicated which sport they are playing (choice of 22 sports), which Division they compete in (Division I, II and III), and their respective gambling experiences.

Gambling Participation. All gambling questions referred to student-athletes' behaviours during the past 12 months. Participants were initially categorized as gamblers or non-gamblers based on their responses to the Gambling Activities Questionnaire (GAQ; Gupta & Derevensky, 1996), which asks about frequency of participation in 10 common gambling activities over the past 12 months ("daily," "at least once a week," "at least once a month," "less than once a month," and "not at all"). Individuals reporting no gambling in any form in the past year were categorized as non-gamblers. Those reporting having gambled at least once on any of the activities in the previous year were categorized as gamblers. Additional

questions regarding participation in sports wagering and fantasy sports were asked including "Have you engaged in any of these forms of sports betting for money during the past 12 months?" Responses to this question include "bets on individual games," "online daily or weekly fantasy sports contests," and "season-long fantasy sports contests." Moreover, from 2008 onwards, participants were asked "When did you gamble in any form for money for the first time?" Responses to this question included "before high school," "high school," "college," and "I've never gambled for money." Following this question, participants were asked "When you gamble that first time for money, which of the following did you do?" This question was followed by the gambling activities listed in the GAQ.

Problem Gambling. Gamblers were further divided into three categories based on their responses to a questionnaire format of the DSM-IV-TR (American Psychiatric Association, 2000) criteria for pathological gambling. As the latest edition of the DSM was published in 2013 (DSM-5, American Psychiatric Association, 2013), the 2016 survey included the DSM-IV-TR criteria for pathological gambling to establish consistency between the survey findings. The questionnaire format of the diagnostic criteria (symptoms) used for pathological/ disordered gambling contains 10 items including: (1) need to increase wagers to achieve same level of excitement (tolerance); (2) feelings of restlessness or irritability when attempting to cut down or stop gambling (withdrawal); (3) unsuccessful attempts to cut back or stop; (4) preoccupation with gambling; (5) engagement in gambling when feeling distressed; (6) returning to get even after losing money gambling ("chasing" losses); (7) lying to conceal involvement in gambling; (8) jeopardizing significant relationships, employment or schooling because of gambling; (9) borrowing money to pay for gambling debts; and (10) engaging in illegal activities to pay for gambling. Standard cut-off scores for problem gambling categorization were used to group gamblers into three categories of problem gambling. Participants reporting 0-2 symptoms were categorized as social gamblers, those reporting 3-4 symptoms were categorized as at-risk gamblers, and those who endorsed 5 or more symptoms were categorized as probable pathological gamblers (PPGs). This system of categorization has been used in several previous studies (e.g., Shead et al., 2014; Temcheff, Derevensky, & Paskus, 2011). The questionnaire format of the DSM-IV-TR criteria for pathological gambling has been reported as having a strong internal consistency (.92) and an agreement rate (87%) with the South Oaks Gambling Screen (Lesieur & Blume, 1987).

Gambling Knowledge and Attitudes. Student-athletes were asked about their awareness of NCAA rules and regulations regarding gambling and sports wagering. Participants provided a dichotomous "Yes" or "No" answer to whether they had received information on the NCAA rules concerning gambling. Furthermore, student-athletes provided information regarding their general attitudes towards sports wagering and the effectiveness of various initiatives to discourage studentathletes from wagering on sports. Responses were provided on a 5-point scale ranging from "Strongly Agree" to "Strongly Disagree." Certain of the questions assessing student-athlete attitudes include: "Sports wagering is acceptable so long as you wager on the sport other than the one in which you participate," "I think sports wagering is a harmless pastime," and "If I chose to wager on sports, I could consistently make a lot of money."

Data Preparation

Responses were reviewed using a series of validity checks and Item Response Theory techniques to identify questionable patterns of response. Responses were excluded from the analyses if strong evidence existed of insincere responses. These cleaning procedures were applied to the 2004, 2008, 2012 and 2016 survey data to enhance comparability. As these cleaning procedures were applied retroactively to the 2004 survey data, the results reported in the present paper are not identical to those previously reported for the same data (Ellenbogen et al., 2008).

Additional procedures were applied to account for differences in sampling strategies and survey content between the 2004 and other surveys. These procedures were aimed at making more accurate comparisons across samples. To account for differences in sampling strategies, we applied a filter to all data sets such that respondents participating in one of 22 sports (11 men's sports and 11 women's sports) were adequately sampled in each of the three NCAA Divisions. Furthermore, data from the 2004 survey were weighted to the NCAA's estimate of 2008 participation rates within the 22 sports to account for differences in sampling proportions within each cohort and to scale the results from both years in relation to current national participation figures. To account for differences in survey content, we applied an additional set of filters to all samples to ensure that problem gambling severity rates were comparable. Participants in all samples were categorized as either non-gamblers, social gamblers, at-risk gamblers, or PPGs based on responses to the GAQ and DSM-IV-TR questionnaires. However, differences in formatting of the surveys necessitated survey-specific methods of filtering out certain participants with missing data.

In the 2004 survey, the GAQ immediately preceded the DSM-IV-TR questionnaire. The DSM-IV-TR questions contained the instruction "If you have not gambled, bet or wagered in any way during the past 12 months, please skip [this section]." Despite this instruction, certain of the participants who reported gambling on the GAQ skipped the DSM-IV-TR as they may not have believed themselves to have problems with gambling. Accordingly, the following four guidelines were employed to filter out and categorize respondents: (1) respondents who missed the GAQ and DSM-IV-TR questions were categorized as missing and were excluded (1.5%); (2) respondents who indicated no gambling in the past year on the GAQ were categorized as non-gamblers, whether or not they completed or skipped the DSM-IV-TR; (3) respondents who indicated any gambling participation on the GAQ in the past year but skipped the DSM-IV-TR were categorized as social gamblers; and (4) all other respondents who indicated gambling participation on the GAQ and who completed the DSM-IV-TR were categorized according to their responses on the DSM-IV-TR.

Whereas the 2004 survey placed the DSM-IV-TR gambling questions immediately following the GAQ, the remaining three surveys placed the DSM-IV-TR questions several sections after the GAQ. This gap between the GAQ and DSM-IV-TR raises the possibility that certain participants might be incorrectly categorized when applying the previous guidelines. The following guidelines were employed to filter out and categorize participants in the 2008, 2012 and 2016 samples: (1) those persons who missed the GAQ or the section preceding the DSM-IV-TR and did not complete the DSM-IV-TR questions were categorized as missing and were excluded; (2) those persons identified as non-gamblers on the GAQ, did not skip the section preceding the DSM-IV-TR, but skipped the DSM-IV-TR were categorized as non-gamblers; (3) those persons who indicated any gambling participation on the GAQ in the past year but skipped the DSM-IV-TR questions, were categorized as a social gamblers; and (4) all others who indicated any gambling participation on the GAQ and who completed the DSM-IV-TR.

As a result of differences in survey sampling strategies and survey content, comparisons are not available for each item across all surveys. While there are 23 official NCAA sports, comparisons are limited to the 22 sports that were adequately sampled across all 4 survey administrations. After applying all data cleaning and filtering procedures, comparative data were available for 19,354 student-athletes from 2004, 19,371 from 2008, 22,935 from 2012, and 22,388 from 2016.

Data Analysis

The large sample sizes and number of statistical analyses employed greatly increased the possibility of spurious findings. Accordingly, the threshold probability for reporting statistical significance was set at an alpha level of 0.001 rather than the conventional 0.05. Pearson chi-square tests were conducted to compare differences across years using SPSS software. The Phi coefficient (φ) (Calkins, 2005), was provided as an index of the strength of association between variables.

Results

Gambling Activities Among Student-Athletes

Male student-athletes. Overall, participation in gambling among male studentathletes decreased over the twelve-year span. In 2016, 55% of men reported engaging in some form of gambling for money in the past year, compared to 57% of men in 2012 (χ^2 (1, 26730) = 10.90, p < .001, $\varphi = .02$), 66% in 2008 (χ^2 (1, 27205) = 34.20, p < .001, $\varphi = .04$), and 71% in 2004 (χ^2 (1, 25656) = 697.52, p < .001, $\varphi = .16$). This overall reduced gambling participation rate was observed across most gambling activities (Table 2). The activity that showed the largest decrease over time was playing cards for money, with 46.8% of men engaging in this activity over the past year in 2004 and 22.9% in 2016 (χ^2 (1, 25656) = 1625.05, p < .001, $\varphi = .25$). Monthly engagement in playing cards for money on a monthly basis also decreased drastically over the twelve-year span. Furthermore, although rates of past year Internet casino gambling increased from 2004 to 2008 (χ^2 (1, 24006) = 210.18, p < .001, $\varphi = .09$), there had been a decrease from 2008 to 2012 (χ^2 (1, 25080) = 163.5, p < .001, $\varphi = .08$), and no change from 2012 to 2016 (p = .01). A similar pattern of engagement is reported for past month Internet casino gambling. Rates of past year (p = .014) and monthly (p = .082) sports wagering did not increase in 2016 compared to 2012.

Rates of past year and weekly gambling participation for male college-student athletes across different sports are presented in Figure 1. Overall, rates of past year gambling have continued to decrease for all reported sports. As for rates of weekly gambling, most athletes in different sports indicated a continued decrease or no change from 2012 to 2016. Two male sports indicated an increase in weekly gambling in 2016 compared to 2012; lacrosse (χ^2 (1, 26730) = 38.49, p < .001, $\varphi = .04$) and wrestling (χ^2 (1, 26730) = 29.05, p < .001, $\varphi = .03$). As for athletes who reported the highest rates of weekly gambling, male golfers indicated the highest rates across all four time points. Regarding gambling rates by Division, rates of past year gambling have continued to decrease since 2004 (Figure 2). Comparing rates of past year gambling between 2012 and 2016, all Divisions indicated a significant decrease in participation (Division 1, χ^2 (1, 26730) = 56.93, p < .001, $\varphi = .05$; Division 2, (χ^2 (1, 26730) = 29.87, p < .001, $\varphi = .03$; Division 3, χ^2 (1, 26730) = 67.00, p < .001, $\varphi = .05$). Rates of weekly gambling by Division did not reveal a significant decrease in any of the Divisions since 2012.

Despite the NCAA adopting bylaws that prohibit engagement in gambling activities related to intercollegiate or professional sporting events, sports wagering still appears to be a frequent activity among men. Consistent with results from 2012, wagering on the NFL (65%) was the most common target of sports betting, followed by NCAA

Table 2

Gambling activity	Past year gambling (%)				Monthly gambling (%)			
	2004	2008	2012	2016	2004	2008	2012	2016
Lottery tickets	36.2	31.4 _a	35.2 _{ab}	36.4 _b	11.1	9.1 _a	11.1 _b	10.3 _b
Played cards for money	46.8	45.9	27.4 _{ab}	22.9_{abc}	20.6	14.3 _a	6.1 _{ab}	5.7 _{ab}
Bet on games of personal skill	39.7	33.1 _a	25.4 _{ab}	23.3_{abc}	16.3	13.0 _a	9.9 _{ab}	9.5 _{ab}
Bet on horse/dog races	9.8	8.5	6.5 _{ab}	6.3 _{ab}	2.0	1.4	1.5	1.2
Commercial bingo	6.5	6.9	5.3	5 _{ab}	0.9	1.1	1.2	1.3
Gambled in casino		22.9	18.7 _b	18.6 _b		3.8	3.3	3.2
Internet casino games	6.8	12.3 _a	7.5 _b	6.7 _b	2.8	4.7_{a}	1.9 _b	1.8 _b
Shot dice/craps	13.4	11.7_{a}	7.8 _{ab}	7.7 _{ab}	4.3	3.9	2.5 _{ab}	2.7_{ab}
Slot machines	19.8	15.1 _a	11.9 _{ab}	11.8 _{ab}	3.6	2.0_{a}	1.8 _a	2.0_{a}
Sports wagering	23.5	29.5 _a	25.7 _{ab}	24.4 _b	9.6	9.6	8.3	8.9

Men's participation in various gambling activities in 2004, 2008, 2012 and 2016

Note. 2x2 Pearson chi-square tests (df = 1) compared the 2004, 2008, 2012 and 2016 sampling distributions of respondents. a = significantly different from 2004 at p < 0.001; b = significantly different from 2008 at p < 0.001; c = significantly different from 2012 at p < 0.001; d = significantly different from 2016 at p < 0.001.



Figure 1. Past year and weekly gambling participation rates among male student-athletes across different sports.

basketball (55%). As for betting on college games, these rates of participation remain low with the lowest level of engagement being present for betting on a college game involving one's own team. In 2016, only 1.4% of men outside of Division I basketball and football bet on their own team, and 2% report betting on another team at their school. Generally, reported rates of betting on one's own team have decreased compared to the highest rates in 2008 (2.2%) (χ^2 (1, 20531) = 18.52, p < .001, $\varphi = .03$). However,



Figure 2. Past year and weekly gambling participation rates among male student-athletes across Division.

no significant changes are reported for betting on another college team comparing the reported rates from 2016 to the highest reported rates in 2008 (2.6%) (p = .004).

Finally, in regard to participation in fantasy leagues involving entry fees and prize money, 20% of men in the 2016 survey reported engagement, a significant increase from 17% in 2008 (χ^2 (1, 25667) = 37.86, p < .001, $\varphi = .04$), although not significantly different than 19% in 2012 (p = .04). Specifically, rates of participation in season long fantasy (17%) were higher than rates of daily or weekly fantasy (11%) in 2016 (χ^2 (1, 27314) = 204.46, p < .001, $\varphi = .09$). When asked about total money spent on fantasy sports within the past year, most men reported spending less than \$50 (67%) with some spending between \$50 and \$99 (18%).

Female student-athletes. Female student-athletes report participating in gambling at much lower rates than men. While overall rates of gambling participation among women decreased from 2004 (49%) to 2008 (39%) (χ^2 (1, 14716) = 149.25, p < .001, $\varphi = .10$), participation rates have remained relatively constant between 2008 and 2016 (39% in 2008; 39% in 2012; 38% in 2016). Participation rates for all gambling activities from 2004 to 2016 are reported in Table 3. Playing cards for money and betting on games of personal skill on a yearly and monthly basis showed the largest decline over this time period. A minor decrease was also observable for past year engagement in Internet casino games, yet these changes were not statistically significant (p = .006). Finally, rates of engagement in sports wagering have been decreasing over time, with the lowest rates of past year and monthly participation being reported in 2016.

Rates of past year and weekly gambling participation for female college-student athletes across different sports are presented in Figure 3, whereas Figure 4 represents

Gambling activity	Past year gambling (%)				Monthly gambling (%)			
	2004	2008	2012	2016	2004	2008	2012	2016
Lottery tickets	29.7	24.0 _a	30.5 _b	30.9 _b	5.4	3.5 _a	5.1 _b	3.7 _{ac}
Played cards for money	19.0	10.7_{a}	5.3 _{ab}	4.2_{ab}	4.4	1.3 _a	0.6 _a	0.4_{a}
Bet on games of personal skill	14.1	7.2_{a}	4.0_{ab}	2.8 _{ab}	3.2	1.2_{a}	0.7_{a}	0.4_{a}
Bet on horse/dog races	4.8	3.2_{a}	2.8 _a	2.7 _a	0.4	0.1	0.2	0.2
Commercial bingo	7.3	6.8	6.2	5.3 _{ab}	0.8	0.8	0.8	0.7
Gambled in casino		11.0	9.4 _b	7.7 _{bc}		0.6	0.6	0.4
Internet casino games	2.1	1.9	1.8	1.3	0.8	0.2	0.3	0.1
Shot dice/craps	3.5	2.2 _a	$2.0_{\rm a}$	1.4 _a	0.7	0.3	0.3	0.1
Slot machines	14.3	9.9 _a	8.4 _{ab}	7.2 _{ab}	1.3	0.5	0.6	0.3
Sports wagering	6.7	6.6	5.0 _{ab}	4.9_{ab}	1.5	0.8	0.6	0.5

Table 3

Women's participation in various gambling activities in 2004, 2008, 2012 and 2016

Note. 2x2 Pearson chi-square tests (df = 1) compared the 2004, 2008, 2012 and 2016 sampling distributions of respondents. a = significantly different from 2004 at p < 0.001; b = significantly different from 2008 at p < 0.001; c = significantly different from 2012 at p < 0.001; d = significantly different from 2016 at p < 0.001.



Figure 3. Past year and weekly gambling participation rates among female student-athletes across sports.



Figure 4. Past year and weekly gambling participation rates among female student-athletes across Division.

rates of past year and weekly gambling participation by Division. Generally, rates of yearly and weekly gambling have continued to decrease over time or have remained the same. However, two sports showed an increase in rates of yearly gambling including

hockey (χ^2 (1, 18593) = 17.77, p < .001, $\varphi = .03$) and volleyball (χ^2 (1, 18593) = 19.06, p < .001, $\varphi = .03$). Only track showed a significant increase in weekly participation from 2012 to 2016 (χ^2 (1, 18593) = 19.34, p < .001, $\varphi = .03$). Compared to the other sports, female golfers indicated the highest rates of weekly gambling. As for the NCAA Divisions, rates of gambling participation have continued to decrease among all Divisions over the 12-year span. Notably, there was no change in weekly gambling participation rates from 2012 to 2016 among Division I athletes (p = .19).

Compared to men, sports wagering appears to be a much less frequent activity among women. For the few women betting on sports, the most common target of sports betting in 2016 was wagering on NCAA basketball (44%) and on the NFL (44%). Additionally, betting on college games appears to be a relatively rare event for women, with extremely low base-rates being present in 2016. Finally, in regard to participation in fantasy leagues involving entry fees and prize money, 3.1% of women in the 2016 survey reported participation, an increase from 1.8% in 2012 (χ^2 (1, 18593) = 33.16, p < .001, $\varphi = .04$), but no different than the rates in 2008 (2.4%; p = .007) and 2004 (2.7%; p = .13). Specifically, rates of participation in season long fantasy (2.7%) were not significantly different than rates of daily or weekly fantasy (2.4%) in 2016 (p = .21). When asked about total money spent on fantasy sports within the past year, most women reported spending less than \$10 (57%) or between \$10 and \$49 (37%).

Problem-Gambling Behaviour

Generally, the percentage of student-athletes categorized as at-risk and PPGs decreased over the twelve-year span (Table 4). In 2016, 45.3% of men were identified as non-gamblers, compared to 42.3% in 2012, 33.7% in 2008 and 29.3% in 2004. The percentage of men categorized as social gamblers also decreased from 2004 to 2016, suggesting that a lower number of individuals are engaging in recreational gambling. As for at-risk and PPGs, rates have remained similar between 2012 and 2016 (p = .56). Notably, rates of at-risk/PPG in 2016 are lower than those reported in both 2004 (χ^2 (1, 25656) = 112.33, p < .001, $\varphi = .07$) and 2008 (χ^2 (1, 25667) = 95.66,

Table 4

DSM classification	Men (%)			Women (%)				
	2004	2008	2012	2016	2004	2008	2012	2016
Non-gambler	29.3	33.7 _a	42.3 _{ab}	45.3 _{abc}	51.1	61.4 _a	61.3 _a	62.4 _a
Social gambler	66.7	62.5 _a	55.8 _{ab}	52.8 _{abc}	48.6	38.2 _a	38.6 _a	37.5 _a
At-risk gambler	2.9	1.8	1.2 _a	1.1_{a}	0.3	0.2	< 0.1	< 0.1
Probable pathological gambler	1.1	2.0	0.7b	0.7b	< 0.1	0.2	< 0.1	< 0.1

Problem gambling severity among men and women based on DSM-IV-TR classification in 2004, 2008, 2012 and 2016

Note. 2x2 Pearson chi-square tests (df = 1) compared the 2004, 2008, 2012 and 2016 sampling distributions of respondents. a = significantly different from 2004 at p < 0.001; b = significantly different from 2008 at p < 0.001; c = significantly different from 2012 at p < 0.001; d = significantly different from 2016 at p < 0.001



Figure 5. Proportion of at-risk and probable pathological gamblers (PPGs) among male student-athletes across sports.

p < .001, $\varphi = .06$). Proportions of at-risk/PPGs across different sports are presented in Figure 5, whereas rates of at-risk/PPGs by Division are presented in Figure 6. Generally, we can see a decrease in the rates of at-risk/PPGs over time with certain gambling behaviours staying the same since 2012. Male golfers were the athletes with the highest rates of at-risk/PPG compared to all other NCAA sports.



Figure 6. Proportion of at-risk and probable pathological gamblers (PPGs) among male student-athletes across Division.

As for women, the proportion of non-gamblers increased since 2004 (51.1%) yet had remained similar between 2008 (61.4%), 2012 (61.3%) and 2016 (62.4%). A similar trend was found for women identified as social gamblers. In both 2012 and 2016, less than 1% of women were at-risk or PPGs. As women engage in gambling activities at a much lower rate than men and participation rates remained generally stable, it is expected that problem gambling rates among women have also remained low and stable over the twelve-year span. The proportion of at-risk/PPGs among females was extremely low which prevented statistically reliable comparisons within sports and Divisions between 2004 and 2016.

Origin of Gambling Behaviours

Student-athletes were asked about their age when they first gambled. Descriptive data regarding the origins of gambling behaviours are depicted in Table 5. In 2016, most men who had gambled in the past year, reported first gambling in high-school or before high-school. Among women, the majority reported first gambling in high-school or in college. Generally, similar findings are reported across the years, with an increase of men and women reporting first gambling in college within the 2016 cohort compared to 2012 (men, χ^2 (1, 26730) = 118.27, p < .001, $\varphi = .07$; women χ^2 (1, 18593) = 83.00, p < .001, $\varphi = .07$).

In regard to the first activity student-athletes report participating in, men most frequently endorsed cards/poker (35%), sports betting (26%), and games of personal skill (14%) in 2016. These initiating activities were similar in 2012, with men most frequently endorsing cards/poker (48%), sports betting (20%) and games of personal skill (12%). Women reported a different entry point into gambling when compared to men. In 2016, women reported lottery or scratch tickets (27%), cards/poker (18%), and slots (18%) as the most popular initial gambling activities. This pattern of behaviours was similar in 2012, with lottery or scratch tickets (26%), cards/poker (24%), slots (15%), and sports wagering (13%) being the most common activities women engaged in as their first gambling experience.

First time gambled for money		Men (%)	Women (%)			
	2008	2012	2016	2008	2012	2016
Before high-school	26	33 _a	31 _{ab}	13	18 _a	13 _b
High-school	66	59 _a	57 _{ab}	63	57 _a	56 _a
College	8	8	12 _{ab}	24	25	31 _{ab}

Table 5Origins of gambling behaviors among men and women in 2008, 2012 and 2016

Note. 2x2 Pearson chi-square tests (df = 1) compared the 2008, 2012 and 2016 sampling distributions of respondents. a = significantly different from 2008 at p < 0.001; b = significantly different from 2012 at p < 0.001; c = significantly different from 2016 at p < 0.001

Gambling Knowledge and Attitudes

Student-athletes were asked about their awareness of NCAA rules and regulations regarding gambling and sports wagering. Since there have been reported variations in the awareness of rules based on athletic Division (Sansanwal et al., 2018), these comparisons were made across Division I, II and III athletes. Over the past twelve years, knowledge and awareness of NCAA sports wagering rules appears to have increased; highest among Division I athletes (76% men; 82% women), lowest among Division II athletes (68% men; 64% women). These rates of awareness among Division I athletes were slightly lower in 2012 (72% men (χ^2 (1, 9417) = 19.47, p < .001, $\varphi = .05$); 76% women (χ^2 (1, 6679) = 36.18, p < .001, $\varphi = .07$), while being quite similar to rates in 2008 (77% men (p = .22); 83% women (p = .27). Furthermore, in 2016, 70% of student-athletes "agreed" or "strongly agreed" that the threat of NCAA penalties discourages student-athletes from wagering on sports. Although this represents a decrease from 75% in 2012 (χ^2 (1, 45323) = 141.99, p < .001, $\varphi = .06$), it is still higher than the 64% agreeing or strongly agreeing with this statement in 2008 (χ^2 (1, 41759) = 169.62, p < .001, $\varphi = .06$).

In the 2016 survey, 39% of men and 20% of women reported that sports wagering is acceptable so long as they are wagering on a sport in which they do not participate. These attitudes have changed significantly, as 57% of men (χ^2 (1, 26730) = 867.76, p < .001, $\varphi = .18$) and 41% of women (χ^2 (1, 18593) = 952.33, p < .001, $\varphi = .23$) reported this was acceptable in 2012. Similarly, in 2016, 49% of men and 31% of women perceived sports wagering is a harmless pastime, representing a significant decline compared to 2012 (68% men (χ^2 (1, 26730) = 992.02, p < .001, $\varphi = .19$); 58% women (χ^2 (1, 26730) = 1361.92, p < .001, $\varphi = .27$). However, these attitudes were more like perceptions held in 2008, albeit they were still significantly lower for men in 2016 (53% men (χ^2 (1, 25667) = 40.85, p < .001, $\varphi = .04$); 33% women (p = .007). Finally, 31% of men and 13% of women believed they could make a lot of money wagering on sports in 2016. These rates depict a significant change over time, where 59% of men (χ^2 (1, 26730) = 2118.03, p < .001, $\varphi = .28$) and 49% of women (χ^2 (1, 18593) = 2753.45, p < .001, $\varphi = .38$) believed this to be the case in 2012, and 51% of men (χ^2 (1, 25667) = 1061.59, p < .001, $\varphi = .2$) and 36% of women (χ^2 (1, 16092) = 1174.58, p < .001, $\varphi = .27$) believed this to be the case in 2008.

Discussion

The purpose of this study was to compare the results of the 2004, 2008, 2012 and 2016 NCAA national surveys while providing further context and detail to the original NCAA report (National Collegiate Athletic Association, 2017). Despite greater availability and accessibility of gambling opportunities, including the expanding popularity of sports wagering, overall past year and past month gambling participation rates are the lowest among the 2016 cohort of student-athletes. Furthermore, results indicate an overall increase in the proportion of non-gamblers and consequently a reduction of social, at-risk and PPGs. This study also provides

novel insight regarding differences in gambling participation by NCAA division, sport, and the change in attitudes since 2012 with regards to sports wagering.

Previous research reports mixed findings regarding whether college student-athletes gamble more frequently or have more gambling-related problems than non-athletes (Stuhldreher et al., 2007; Weinstock et al., 2007), with a recent review indicating that student-athletes have higher rates of pathological gambling than non-athletes although they report similar rates of gambling engagement (Nowak, 2018). Based on previously identified rates of past year gambling among a general population of college students (Barnes et al., & Tidwell, 2010; Blinn-Pike et al., 2007; Lostutter et al., 2014), student-athletes in the present study appear to have significantly lower rates of past year gambling participation. To explain this difference, it is possible that compared to non-athletes, student-athletes have less time to participate in gambling given their additional athletic responsibilities (e.g., regular athletic training, attending practices and games, maintaining a high academic standard). Furthermore, although rates of problem and pathological gambling appear to be lower among student-athletes in the present study, direct comparisons between studies may be difficult because of the different measures utilized to assess problem gambling. Notably, whereas the NCAA studies utilize the questionnaire format from the DSM-IV-TR (American Psychiatric Association, 2000) as a measure for pathological gambling, previous studies have typically incorporated the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987), which has been reported as identifying higher rates of false positives, thus revealing much higher prevalence rates of PPGs compared to the DSM diagnostic criteria (Goodie et al., 2013).

Comparing rates of gambling among NCAA student-athletes in 2004 and 2008, Shead et al. (2014) reported that although rates of past year and past month gambling decreased over this period, rates of at-risk/PPGs remained relatively constant. Furthermore, Sansanwal, Derevensky and Paskus (2018) reported that participation rates for all gambling activities had decreased over the eight-year span while the proportion of students being at-risk/PPGs decreased among men yet remained relatively constant among women. The current study extends these findings to the 2016 NCAA data set, establishing that over the 12-year period, rates of at-risk/PPGs have marginally decreased among men. Notably, 4.0% of men were identified as being combined at-risk/PPGs in 2004 and 2008, a figure which subsequently decreased to 1.9% in 2012 and 1.8% in 2016. As for women, these rates have remained quite low over the 12-year span, with less than 0.1% of women being at-risk/PPGs in 2016.

As for the rates of gambling by sport, both male and female golfers were once again found to have the highest rates of weekly gambling, with the highest rates of at-risk/ PPG being found among male golfers. Previous reports have found similar results where golfers indicated the highest rates of weekly gambling and at-risk/problem pathological gambling (Shead et al., 2014). As there is a strong connection between golf and gambling (LeCompte, 2005), it is not surprising that these findings were found consistently over time. Golf is generally characterized by long breaks between shots during which players have the time to bet on the outcome of a single shot, a single hole, nine holes, or an entire round. Since gambling is entrenched in the culture of golf, it is possible that gambling on golf carries over into other activities outside of the sport. It is also conceivable that golfers who view gambling as a normative activity may be more likely to seek other gambling opportunities outside of the sport.

Regarding the differences between NCAA Divisions, Division III athletes were found to have higher rates of past year gambling, followed by Division II athletes and Division I athletes. Although rates of weekly gambling and at-risk/PPG decreased in all Division from 2004 to 2012, there was not a significant decrease in these rates in 2016. As Division I athletes report being more knowledgeable of NCAA rules and regulations concerning sports wagering, it is possible that knowledge of potential repercussions (e.g., loosing athletic eligibility) are keeping them from engaging in gambling as frequently as other athletes. Furthermore, as Division I athletes face a high level of public scrutiny compared to Division II and II athletes, they may avoid engaging in gambling because of the heightened risks associated with such actions.

Internet gambling and sports wagering have both been identified as significant risk factors for an increased frequency of involvement in gambling among studentathletes (, Derevensky, & Paskus, 2014; Marchica & Derevensky, 2015). Although nearly a quarter of men report wagering on sports over the past year from and close to 9% participated in sports wagering over the past month, Internet gambling does not appear to be as significant a concern. To explain this disparity, it is possible that sports wagering attracts a greater number of participants when compared to other forms betting as sports is a culturally valued activity, especially among athletes. However, one of the most significant changes in beliefs across the twelve-year span has been in the increase of student-athletes perceiving sports wagering is an unacceptable and harmful pastime. Comparing results from 2012 and 2016, there was an 18% change in men and 21% change in women reporting sports betting is unacceptable even if it is on a sport they do not participate in. Furthermore, 19% more men and 27% more women see sports betting as harmful in 2016 compared to 2012. A possible factor that may account for this change in beliefs is the recent emergence of novel mediums through which individuals can now participate in sports wagering. With the recent growth of online daily and weekly fantasy sports (FSTA, 2018), it is possible that more depersonalized and solitary forms of online sports wagering are increasing perceptions of risk among student-athletes. In the earlier samples, student-athletes may have predominantly participated in sports wagering by betting on season long fantasy or on individual games with friends or teammates. This form of betting may have led student-athletes to believe that they had higher odds of winning while being less harmful. However, in 2016, with the rise of online daily fantasy sports, it is possible that students now perceive heightened risks associated with online sports wagering, both socially and financially. Alternatively, it also is conceivable that the NCAA awareness programs and enforcement groups are another factor responsible for this notable change in perceptions over time. Further research is required to differentiate between different types of sports betting and associated

perceptions of risk among student-athletes and whether educational efforts are effective in changing perceptions of harm regarding sports wagering.

Over the years, the NCAA has implemented various awareness and prevention programs, enforcement groups and a website to educate and reduce rates of gambling and sports wagering among its student population. Although the effect of these initiatives was not investigated directly in this study, comparing rates of gambling and at-risk/PPGs from 2004 to 2016, it would appear as though the NCAA's strategy may be effective in discouraging athletes to participate in gambling, especially among Division I students. However, other factors may have been responsible for the reduced rates of gambling. For example, because of awareness programs, a reduced willingness to engage in gambling may have been present for student-athletes as they may fear suspension or loss of scholarship eligibility. Furthermore, there may have been an increase in direct discouragement by teammates and coaches to engaging in gambling in the recent years.

Based on the study findings from 2004 to 2016, the adaptation hypothesis may appear to explain best gambling trends among student-athletes. The adaptation hypothesis posits that as gambling becomes more accessible, gambling will be seen as something less novel and exciting, resulting in people gambling less frequently while experiencing less gambling-related problems (Shaffer, 2005). As would be expected based on the adaptation hypothesis, engagement in gambling among student-athletes has decreased over time and so have rates of problem/pathological gambling. Comparing the availability of gambling venues from 2004 to 2016, modalities of gambling have expanded exponentially, with an increased number of casinos, Internet gambling websites and opportunities to wager on sports (American Gaming Association, 2013). However, rates of gambling participation among studentathletes have declined over time. Given these findings, it is possible that rates of gambling participation among student-athletes will continue to decrease over time as this activity becomes less novel and increasingly normalized for younger individuals.

Limitations

Although this study marks a rigorous attempt in observing changes in gambling behaviours and attitudes among NCAA college student-athletes over a twelve-year period, the study is subject to several limitations. First, the data collected from the 2004, 2008, 2012 and 2016 surveys are all self-report. Although student-athletes were informed that responses were confidential, the seriousness of certain of the questions asked (with items pertaining to violations of NCAA policies that could result in loss of eligibility), may have led participants to omit or under-report their actual gambling participation. Although data cleaning procedures were implemented to try to eliminate dubious responses, such methods may not be as effective in detecting purposefully omitted data. Second, comparability of the findings may be less accurate between the 2004 and other surveys because of the modification in the survey's general format. Third, multiple undetected cohort and environmental

factors may have been responsible for the observed decrease in gambling and problem gambling behaviour over the twelve-year period. Further longitudinal research is needed to ascertain the trajectory of student-athlete gambling and whether these behaviours are maintained over time. Despite these limitations, the results of this study with comparative data of over 84,000 college student-athletes, suggest an overall decline in gambling participation rates among student-athletes, despite the easier accessibility, broader availability, and greater societal acceptance of gambling behaviours.

Future Directions

With the recent US Supreme Court ruling permitting states to have legalized sports wagering, it will be increasingly important to carefully monitor changes in gambling behaviours among college student-athletes. As gambling becomes more normalized among American youth, student-athletes remain an at-risk population for problem gambling and sports gambling-related scandals. Although gambling behaviours have decreased in this population over the past 12 years, sports wagering remains a popular and frequent activity. Given the negative impact of problem gambling on student-athletes, the development and refinement of comprehensive sports wagering and gambling educational program within the NCAA is essential. Innovative and contemporary educational programs directed towards students, athletic staff and coaches should be developed and implemented across all Divisions to address evolving issues relevant to sports wagering and the potential to undermine the integrity of sporting contests. For instance, attention could be drawn to NCAA rules and regulations concerning sports wagering and strategies could be offered to coaches and athletic staff to address issues related to gambling. Additionally, identifying specific risk factors associated with gambling problems among studentathletes would be beneficial to target prevention and intervention efforts to those most at-risk of harm and consequences. Lastly, university policies regulating the gambling behaviours of their students on campus could potentially buffer against the negative consequences of problem gambling while influencing attitudes and perceptions towards gambling behaviours.

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For correspondence: Jérémie Richard, M.A., International Centre for Youth Gambling Problems and High Risk Behaviors, McGill University, Duggan House 3724 McTavish Street, Montreal, QC, H3A 1Y2. E-mail: jeremie.richard@mail. mcgill.ca

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