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Research Article

Does Easy Access to Casinos Influence Addictive Gambling Behavior by College Students? The Potential Role of Tribal Gaming in America

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Abstract

This study extends prior research examining whether physical proximity to casinos influences gambling behavior of college students, as well as whether this is related to gender and GPA. We collected data from students at a major urban university, where there are twelve casinos within sixty miles of the campus. Moreover, these casinos are tribal gaming casinos, which are increasingly popular in the United States. Our results show a significantly higher incidence of problematic gamblers than in the national average, indicating that the dense proximity of tribal gaming casinos does influence problematic gambling. Furthermore, we found that this effect is stronger for males. Finally, our data indicated that problematic gamblers are likely to engage in alcohol consumption while gambling. We discuss our results in terms of implications for public policy.

Keywords: California; College students; Problematic gambling; South oaks gambling screen; Tribal gaming

Introduction

Gambling among college students is a significant, but often unseen and underreported, issue on American campuses. An early seminal study by Williams, Connolly, Wood and Nowatzki [1] found that between approximately 72 and 75 percent of college students had gambled during the prior year (whether legally or illegally) with about 18 percent gambling at least weekly. Typically, the most frequently chosen gambling activities by college students are lotteries, card games, pools (including raffles charitable small stakes gambling), sports betting and games of skill (e.g., bowling, basketball, pool, golf, backgammon and darts) [2]. Casino nights, poker tournaments and other gambling activities are popular at special events sponsored by campus organizations and fraternities and sororities. Other studies find similar trends in most common gambling types, with card playing often the most common, along with scratch tickets, slot machines, lottery tickets and betting on dice games [3,4]. Gambling can easily become a problematic behavior. Indeed, research conducted by Nesbitt [5] concluded that at the time of the study, over three-quarters of a million American college students were addicted to gambling.

In addition to on-campus gambling, college students may also visit casinos if located near campus, which may enhance the gambling that they engage in. Consequently, a major question is what role the accessibility of casinos plays in college student gambling behavior and, importantly, problem gambling. In this paper, we propose that this accessibility to nearby casinos plays a role in student gambling behavior. Prior research has come to contradictory results as to whether there is a relationship between casino proximity and increased problematic gambling [6]. To address this, we collect data from students attending a university located in an area that has a large tribal casino presence, as there are three casinos within 30 miles of campus and twelve within 60 miles of campus. As the number of tribal gaming casinos are increasing, it is important to understand their potential impact on gambling behavior. Furthermore, many of these casinos tend to be bigger and offer more games than commercial casinos and therefore may be an especially strong draw for college students. We also examine whether there are differences in problem gambling behavior based on gender, GPA, and age, and finally, we look at the concurrence of gambling and alcohol consumption.

With the results of this study, we hope to raise awareness of the potential impact of proximity of casinos to college campuses, which are full of a population already prone to gambling and especially problem gambling. Importantly, gambling addictions can have important and concerning effects on both physical and mental health and may positively correlate with participation in other "risky" behaviors such as drug and alcohol use [7-9]. Thus, if physical proximity of casinos increases problematic gambling among students, policy makers should proactively address this phenomenon. Our results from this study can inform both public policy makers as well as college campus policies regarding gambling behavior that may interfere with classroom performance or harm students' general well-being.

Gambling: Problem and Pathological Behaviors

The legal definition of gambling includes any activity in which a person pays something of value/consideration to participate in an event that presents the possibility of winning something of value/prize whose outcome is determined at least in part by chance [10]. Classification levels of gambling risk range from non-gamblers to pathological

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gamblers, with increasingly intense degrees of risk between the two extremities. Classifications include non-gamblers, non-problem gamblers, at-risk gamblers, problem gamblers and pathological gamblers. Risky gambling, particularly pathological gambling, can be identified as a treatable mental disorder characterized by a loss of control over gambling, chasing losses, lies and deception, family and job disruption, family bailouts and illegal acts. This loss of control describes that the gambler has not succeeded in cutting down or controlling his or her gambling and needs clinical treatment. Pathological gamblers exhibit gambling behavior that interferes with personal, family and professional relationships. Characteristics of the pathological gambler include obsessing about the act of gambling, lying to family, friends, and employers, escalating the amount wagered to 'chase' losses, and in some cases, engaging in criminal activity. Initial motivation for a pathological gambler may have been to socialize, but ultimately the preoccupation with gambling will shift to chasing losses. A pathological gambler has lost the ability to gamble reasonably and responsibly [11]. Pathological gamblers also often hold the irrational belief that a feasible way of recouping losses is to continue gambling. Pathological gamblers "chase their losses", even though they are much more likely to lose than win. After a significant loss, they may bet even larger amounts on riskier bets to restore what was lost. Based on several studies conducted in the United States, Australia, and New Zealand, the population of problem and at-risk gamblers is significantly higher than that of pathological gamblers [10]. However, the number of pathological gamblers is still of great concern since their severities are more extensive and often worsen. At-risk, problem, and pathological gamblers may all experience depression, guilt, excessive alcohol use, drug problems, attempts at suicide, and stress-related physical illnesses such as hypertension and heart disease [10].

College student gaming: Prevalence of problem and pathological gamblers

College students are known to engage in risky behaviors such as binge drinking, drug use, and gambling at higher rates than the general adult population [12]. Research exploring student engagement in drinking and drug use is plentiful, and while neglected at first, studies examining student gambling are gaining a presence in the dialogue on college student health. Of particular concern are the numerous studies that have concluded that the prevalence of pathological and problem gamblers among college students is significantly higher than the general adult population [3,13,14]. A meta-analysis found that college students had a higher rate of problem and pathological gambling at 16.4%, than either adolescents (11.8%) or adults (6.1%) [14]. Other studies have continuously suggested that younger segments of the population-such as college students and adolescents-are more predisposed to gambling problems than adults [15-17]. Other studies have also found that problem gambling rates peak in the (college) age group of 18-24 [13]. Moreover, a comprehensive comparative estimate of the proportion of college students with gambling problems was recently provided by Nowak [12], which included studies done in the United States, Canada, Argentina, Australia, China, Japan, Lebanon, New Zealand, Nigeria, Scotland, Singapore, Spain, and the United Kingdom and assessed 124 independent data estimates retrieved from 72 studies conducted between 1987 and 2016, surveying 41,989 university students worldwide. The results indicated the estimated overall proportion of probable pathological gamblers among students to be 6.1%, while the rate of problem gambling was estimated to be 10.2% (or, 16.3% in total). There are a variety of individual differences and sources of motivation that predict college student gambling. Overall, males are more prone than females to gamble [8,17-21]. Importantly, males have approximately five times the odds of being a heavy or problem gambler as females regardless of college student status [17].

For most college students, gambling is an innocuous pastime with few adverse consequences [22]. However, for a substantial minority of heavy-gambling students, the activity has severe penalties [1]. Nearly every study conducted to determine gambling behavior prevalence rates at the college level has concluded that the number of college students engaging in gambling at the problem or pathological level is significantly higher than that of the general adult population. According to a University of Pennsylvania study and the National Council on Problem Gambling, as many as 5% of college students are "pathological gamblers". An early study by the Annenberg Public Policy Center at the University of Pennsylvania, states that more than 50% of college males gamble every month, and one in four gambles weekly. Of those college males who gamble every week, more than half show signs of addiction [23]. Similarly, Nowak [12] states, "It appears that college and university students around the world are at the highest risk of both problem and pathological gambling throughout their years enrolled in school as an undergraduate, and these rates are higher than in any other population group" (469). Furthermore, problem gambling affects at least 15% of students with some form of gambling disorder behavior. This effect is especially strong in collegiate males, particularly those who are non-whites [12].

College student gambling and increased risk behaviors

Studies have consistently indicated that college students are an at-risk population for gambling problems [8,24,25] but perhaps more concerning are the myriad studies that indicate how addiction to gambling can have a negative impact on the gambler's health, both physical and mental. Pathological gamblers often suffer from psychological issues such as depression, anxiety, and mood disorder, exhibit problem behaviors in other areas, and engage in harmful behaviors, such as drug and alcohol use, high-risk sexual behavior, and eating disorders [7,8]. Pathological gambling is also correlated with depression, with a 9.4% disordered gambling rate among depressed students, compared to a general student gambling rate of 4.2% [26]. Internet gambling, which has become increasingly popular, may be especially problematic, with studies finding that those frequently engaging in Internet gambling wager more in frequency and in amount, miss school more often, have lower grades, and experience more problems with family and anxiety than their non-Internet gambling peers [4,21]. Petry & Weinstock [21] found significant correlation between high online gambling frequency and poor mental health, a trend which is not reflected when examining correlation between other forms of gambling (i.e., dice playing and lottery) and mental health. Risk factors associated with problem gambling such as convenience, easy availability and accessibility, enhanced privacy and perceived anonymity have increased via Internet gambling [27].

Furthermore, both problem and pathological gambling may correlate with participation in other "risky" behaviors such as drug and alcohol use. Engwall et al., [9] found that students who gambled at the problem or pathological level were significantly more likely to report increased rates of binge drinking, smoking marijuana, and smoking more than a half-pack of cigarettes per day. Abbott [28] reported that 37% of problem student gamblers engaged in 'hazardous' alcohol use, a rate more than double that of the adult population [29]. In the same

report, in the year prior to the survey, 16% of student problem gamblers reported using marijuana, and 12% reported partaking in other illicit drugs; this is significantly higher than the rates in the general adult population at 7% and 1% respectively [29].

Drinking has been found to be one of the main motivators for students to participate in gambling, for example by getting drinks (sometimes complimentary) at a casino, although this is not unique to student gamblers [22]. Martin [26] found that heavy drinkers evidenced a 9.0% disordered gambling rate, versus a 4.2% disordered gambling rate in a general sample of college students. The study also found that students who gambled were more likely to report that they used alcohol in the last year and/or month and drank at binge levels in the last two weeks. Martin et al., [8] found that college problem gamblers have a stronger comorbid relationship between problem drinking and depression than the general population and non-problem gamblers. Combining alcohol use and gambling is a risky combination, as intoxication can not only reduce the perception of negative risk taking but can also positively influence a positive perception of the potential benefits of gambling [30].

While the evidence is strong that gambling has negative consequences, college student perceptions of gambling acceptability and gambling harmlessness has been on the increase since 2008, and students largely support the notion that engaging in gambling activities has social benefits and can improve their self-image [31,32]. A survey of a diverse student body by Wickwire and colleagues [31] found that 88% of respondents "disagree" or "completely disagree" that gambling for money can lead to serious problems such as alcohol or drug abuse. The same study also revealed that college students are unconcerned about the potential risks of occasional gambling compared to the risk of occasional drug or alcohol use. Moreover, the increasingly popular method of gambling online has even lower perceptions of risk among students than regular gambling, as online users view it as safer--without pressure from others in a casino for example--and disassociate online gambling from the "real world" and real-world consequences [33]. College students acknowledge the possible risks from online gambling sites but believe that having an advanced education--being "smart" and "savvy"--protects them against manipulative tactics of online gambling sites [33]. Among college students, there is an idea that gambling makes people look intelligent and can be a way to impress others. The study by Wickwire and colleagues [31] found that 92% of participants highly endorsed ("agree" or "completely agree") that ''gambling makes people look smart," followed by "gambling solves financial problems," and "gambling is a way to impress people." The least endorsed item on the survey, with only 34% of students agreeing, was the notion that "gambling is fun and exciting." That study shows that college students mainly participate due to social pressures; to heighten their social image, specifically drawing attention to their "smarts". However, being an at-risk, problem, or pathological gambler is often correlated with low academic achievement [20,21,34].

Role of casino proximity to gambling addiction

Casino proximity is typically defined as the physical distance or driving distance between respondent's residence and nearest casino [35,36]. Physical proximity provides increased access to gambling and the relationship between increased access to legal gambling and the prevalence of problem and pathological gambling is important considering the remarkable expansion of legalized gambling throughout the U.S. and internationally over the last 25 years. Historical trends show greater frequency of gambling and gambling problems since the 1990s as more legalization and expansion of gambling occurred. Many prior studies have measured the level of proximity as being categorical, e.g., near or far or high or low. But the definitions of "high" and "low" casino proximity vary substantially across different studies. For instance, Welte et al., [35] in a study based in the United States, utilized the cutoff point of 10 miles between nearest casino and respondent's home. In contrast, Sevigny et al., [36] categorized casino proximity into 0-100 km, 100.01-200 km, 200.01-300 km, and 300.01 or more km in the province of Quebec, Canada. Thus, in that Canadian study "near" would be defined as within 62.1 miles. On the one hand, several studies have found that proximity does indeed positively influence gambling behavior. Welte, et al., [35] explored the ecological and geographic factors and their impact on gambling behaviors and pathology in the general population. They suggest that the presence of a casino within approximately ten miles of a typical household is positively related to problem and pathological gambling. In addition, the presence of a casino within 50 miles of a household is positively correlated with increased gambling participation. Although now dated, the National Opinion Research Center (NORC) collected extensive national data related to casino proximity and problem gambling in 1999. That study found that the lifetime prevalence rate of problem gamblers increased with closer proximity to a casino; with 2.3% and 2.1% prevalence rates of problem and pathological gamblers, respectively, in a population within 50 miles of a casino, compared to 1.2% and 0.9% in populations further away [37].

Other research has studied the effect of proximity on gambling behavior and addiction. Room et al., [38] studied the opening of a new Canadian casino, built on the border with the United States, with the explicit goal of attracting American gamblers. This was a "destination" casino, designed to attract customers from elsewhere, and not simply dependent on local gamblers. Results showed that there was an increasing trend in the area for all 18 problem gambling indicators and that reported gambling problems increased significantly in the community for two of 10 gambling problems studied and for the short South Oaks Gambling Screen (SOGS) score, in contrast to the generally stable or declining rates in the province. Most studies concur that increased opportunities for legal gambling are associated with an increasing prevalence of problem and pathological gambling among both adults and adolescents [13,39]. However, studies have come to some contradictory conclusions regarding exactly what effect casino proximity has on problem and pathological gambling.

In the college student population, one major study concluded that large public universities, located in cities where gambling is readily available to students, appear to produce a widespread population of potential pathological gamblers [40]. LaBrie et al., [20] concluded that having two or more legalized forms of gambling in the state where the students were attending school also related to higher prevalence rates of gambling. Moreover, Elevated levels of problem and pathological gambling were found during a university study of 560 college students who attended a university in the northwestern United States in a community in which there was ample access to gambling venues [41]. Among the adult population in general, Volberg et al., [10] also studied problem gambling prevalence in California and found that residents in the state face more temptation than most gamblers in the United States due to the proximity and concentration of Indian casinos. Their study of at-risk, problem, and pathological gamblers shows that California had the second highest prevalence rate in the nation, second only to Nevada, with the rate of problem

and pathological gambling in the state 37% higher than the national average.

While these studies do indicate a relationship between casino proximity and gambling prevalence, it is unclear whether casino proximity affects all gambling behavior or simply gambling that takes place in the casino. In a study of four medium-sized Ontario university campuses, 1,579 students were studied regarding correlation between gambling activity and their campus' proximity to a casino [25]. The results find that a significant majority of students (80%) attending universities in close proximity to casinos identified as pathological gamblers, while most students (66%) without gambling problems attend schools that are far from a casino. The authors conclude that attending a university in proximity to a casino encourages casino gambling behavior and problem gambling, as increased exposure may increase positive perceptions and desensitize students to the costs of gambling. Adams et al., [24] note however, that this effect is limited to casino gambling and does not result in increased participation of other forms of gambling.

Sévigny et al., [36] found a positive correlation between increased casino proximity and high gambling activity over 14,000 participants in Canada. That study examined both the positive link between casino proximity and gambling participation both at the provincial level (in Quebec) and to a single casino in Montreal. However, that study did not find a significant correlation between high rates of problem gambling and close casino proximity. The authors explain this phenomenon by the increasing accessibility to types of gambling outside of casinos, therefore arguing that distance to casinos is not a strong predictor of gambling-related problems [36]. Moore et al., [42] explored what they term the "accessible retreat" factor, which they define as the degree to which venues were enjoyed because they were geographically and temporally available and provided a familiar and anonymous retreat with few interruptions or distractions. Gambling venues which ranked highly for accessible retreat (i.e., casinos which were geographically close to participants, had accessible hours, and provided an anonymous and comfortable atmosphere) were found to be highly correlated with stronger urges to gamble and gambling problems [42]. That study does not indicate that gambling proximity is a sole determinant of increased gambling problems in the area. However, it supports the claim that it is an important factor in doing so. More recently, Tong and Chim [6] conducted a meta-analysis of twelve studies, eight cross-sectional and four longitudinal, which were all from North America. Among the eight cross-sectional studies identified, casino proximity was significantly correlated with an increased prevalence of problem gambling in five studies, indicating that casino proximity does have a role in problem gambling.

With increasingly accessible new forms of gambling, such as online wagering, casino access and proximity is becoming one of several ways in which gambling venues are becoming "close to home." Overall, while there is no conclusive consensus among studies, a significant amount of research finds that proximity to a casino is an important factor influencing problem gambling behavior. Importantly, those studies show that accessibility to gambling is a significant predictor of problem gambling behavior.

Growth and Proximity of Tribal Casinos

Gambling was once considered a taboo subject and people were loath to talk about participation because it was considered "immoral" by many. Now, gaming and legal gambling collectively in the United States is a large and prosperous business. The American Gaming Association (AGA), an industry trade group, states that gaming is a $240 billion industry, employing 1.7 million people in 40 states. Legal casino gaming takes place at commercial casinos and at Indian tribal casinos. The AGA reports that in 2018 there were 465 commercial casinos and 514 tribal casinos. Importantly, the number of commercial casinos is now on the decline, while the number of tribal casinos is increasing. Tribal gaming has become hugely successful in the United States. Singh [43] notes that collectively in 2017 there were a total of 243 Native American Indian tribes which operated 512 tribal casinos. Indian gaming revenue in the U.S. was reported to be $31.5 billion in 2016, with California the nation's largest Indian gaming state with total revenues of $7 billion annually (22.4% of the national total). Indeed, California became the birthplace of Indian casinos in 1987 when the United States Supreme Court ruled in the case California v. Cabazon Band of Mission Indians that tribes can operate casinos outside of state jurisdiction if the state has not directly prohibited gambling.

Currently 62 of the 109 California tribes own tribal casinos and have 69 total gaming facilities, including 50 casinos, 16 casino resorts and 3 mini-casinos. These casinos host 70,000 plus total slot machines and 2,000 plus table games. These numbers are more than any other state. A 2016 study commissioned by the California Nations Indian Gaming Association showed that Indian casinos have proved a bonanza for the state, spurring $7.5 billion in annual economic activity and creating at least 52,000 jobs. The San Diego area now has eleven major Indian casinos, all located on reservation land. Gaming revenues are difficult to assess, but in 2007, tribal casinos in the San Diego market were reported to do roughly $2 billion of business a year [44], so they account for a sizable proportion of all tribal gaming in California. Tribal gaming has had a dual impact, generating economic opportunities for tribes, but also causing notable social impact. For instance, a 2016 study commissioned for the California Nations Indian Gaming Association estimated that in 2014, tribal gaming generated an estimated $3.3 billion in economic output, supporting over 21,000 jobs statewide and tribal non-gaming operations added $1.5 billion in value to the California economy [45]. Numerous studies have documented these dual issues, including the seminal work of Sciglimpaglia and Toole [46], who surveyed gaming tribes to determine associated benefits and negative consequences. That study analyzed the impact of casino gaming in California and considered economic (both direct and indirect), social and cultural factors as the relevant impacts.

Based on the above, the San Diego market, the eighth largest in the United States, was selected as the test area for this study. It was chosen specifically based on the large tribal casino presence. Except for Las Vegas and Reno (where Nevada law allows commercial casino operation), no other major market in the United States has a larger proliferation of available casinos. In addition to their presence in this market, tribal casinos are major local advertisers on television, radio, print, billboard and on-line. Indeed, San Diego County has been referred to as the "Indian Gaming Capital of the Nation." The San Diego market has an abundant population of college students, with eleven four-year colleges or universities and eight two-year community colleges. Among them are the University of California San Diego (30,794 students enrolled), San Diego State University (30,612), California State University San Marcos (13,879), University of San Diego (8861) and National University (7,356).

Specifically, one comprehensive university near the geographic center of the county was selected as the test site. For students in the San Diego area, proximity may be an increased temptation to gamble, as the closest Indian gaming casino is just 22 miles away from downtown San Diego. Indeed, the nearest of these is less than 15 miles (or a 15-minute drive) from the test university campus. According to Volberg et al., [10] there were only five Indian gaming casinos in the state of California more popular than the eight casinos closest to university at that time of that study and five of the eight were categorized as "highly preferred by gamers". We assert that those living in the southern portion of California are potentially at a higher risk for developing gambling issues, as there are twelve Indian gaming casinos located in San Diego and Riverside counties alone. Compared to the rest of the state, Volberg et al., [10] found that those counties in southern California displayed the highest levels of problem and pathological gambling, at 4.5% or higher, compared to the majority of California which displayed levels of 2.9 to 4.3%. These assertions are relevant to the investigation of gambling behaviors of students at the test university, as there are three casinos within 30 miles of campus and twelve within 60 miles of campus.

Research Questions and Hypotheses

The overriding issue that this research tries to address is to add to our understanding of the role that ease of access to gaming has for college students. As mentioned above, Tong and Chim [6] found inconclusive results of proximity to casinos on problem gambling behavior, and they concluded that there may be a variety of factors that play into this relationship. According to the theory of reasoned action [47], normative beliefs play an important role in predicting behavior. We contend that several variables, including casino proximity, plays into the normative beliefs of individuals regarding gambling behavior, such that the more prevalent (normative) that gambling is perceived, the greater gambling-specifically problematic gambling-behavior will be. For example, males may look towards other males to gauge their beliefs about whether gambling is a popular behavior, and thus conclude that gambling is a normal behavior as many other people like them are engaging in it, therefore increasing their own gambling behavior [48].

To expand on the extant research, we investigate whether casino proximity affects problem gambling behavior, but look at other factors such as the influence of gender, age, GPA and alcohol consumption. Moreover, we examine this in a population where there is a very high concentration of Indian casinos, which may increase perceptions of access to gambling. Specifically, we investigate whether the proportion of students who are non-problem gamblers, problem gamblers and pathological gamblers is dissimilar from national results. Moreover, we examine whether there is a relationship between demographics and academic performance-specifically gender and GPA-and problem gambling behavior. Attitudinally, we look at whether alcohol consumption is associated with the proportion of students who are gamblers, problem gamblers and pathological gamblers. Finally, we examine whether students feel that proximity of casinos increases the likelihood of gambling participation.

The hypotheses therefore are as follows:

- H1: Proximity and availability of casino gaming impact the proportion of students who are problem and pathological gamblers. Consequently, the proportion of problem and pathological gamblers in the test sample should be greater than in similar national results reported
- H2: The proportion of students who are problem and pathological gamblers should be greater among male students
- H3: Alcohol consumption while gambling is higher among students who are problem gamblers and pathological gamblers
- H4: College students are likely to agree that proximity of casinos increases the likelihood of gambling participation

Measures of assessing problem gambling

The South Oaks Gambling Screen (SOGS) has been one of the most common measures for assessing problem and pathological gambling. The SOGS is a 20-item, self-reported screen first developed by Lesieur and Blume [49]. It was originally developed to screen for pathological gamblers in a clinical setting, to be administered by a non-professional or professional, and issued to both the prospective gambler and a close family member, friend, or loved one for validity. However, it is now utilized frequently in the general population, without such cross-referencing [50,51]. It consists of symptoms or questions related to problem gambling, in which the respondent will answer either "yes" or "no" [29]. According to the SOGS, potential problem gambling is broadly defined by a 'yes' answer to one to four symptoms or items on the survey [49]. Probable pathological gambling is defined by five or more 'yes' answers or symptoms [49]. The term 'probable' is added to distinguish a difference from those who have met the criteria according to the SOGS screen and those who have been identified as pathological gamblers in a clinical interview [28].

Numerous research studies regarding gambling and college students have utilized the SOGS. Recent notable examples include those by Montes and Weatherly [52]; Petry and Gonzalez-Ibanez [4]; Geisner et al.., [53]; O'Brien [54]; Buckle et al., [18]; Barnes et al., [17]; Stuhldreher et al., [19]; Adams et al., [25]; Wickwire et al., [31]; Petry & Weinstock [21]; LaBrie et al., [20]; Clarke [29]; and Lostutter et al., [22]. These studies cover a wide scope of focus, ranging from the differences in gambling behavior amongst Internet and non-Internet gamblers [52], to correlation between student status and problem gambling [17], to perceptions surrounding gambling in the college community [31]. The SOGS is relatively short and provides a means to easily group participants into certain gambling identities, therefore the screen can be used effectively for studying correlations between gambling identity and a variety of other topics. It has been widely used by researchers as one of the leading forms of testing for problematic levels of gambling.

Method

A self-administered survey questionnaire was developed which included casino visitation behavior, various attitudinal questions about gambling, motivation for gambling and demographic information. It also included the South Oaks Gambling Screen (SOGS) and encompassed the key topics utilized in many gambling screens: behavioral signs of problem gambling, emotional and psychological parallels of problem gambling, and unfavorable consequences (including economic and sociological) associated with excessive playing. The study was conducted on the test campus prior to the Covid-19 pandemic. It was conducted using a detailed quota sampling plan and students were surveyed using a combination of direct contact and in-class and campus contact. To conduct the survey, a total of 840 copies of the survey questionnaire were divided among four graduate student assistant researchers. Each graduate assistant was responsible for obtaining a representative sample from a designated college and obtaining a

proper ratio of graduates to undergraduates. The questionnaires were distributed by (1) contacting faculty members from various colleges and asking them to distribute the questionnaires out to their classes and (2) going to buildings of selected colleges and intercepting students going to and from class. In total, 737 of the 840 questionnaires distributed on campus (87.7%), were completed from the student population to participate in this study. To reflect an accurate sample from the student population a quota sampling method was employed. The quota sample replicated the larger population of the campus by obtaining approximately 55% females, 45% males, 20% graduates, 80% undergraduates, and an accurate proportion of individuals representing each of the colleges within the university. Of the completed questionnaires, 402 were from females (54.5%), 335 were from males (45.4%). The sample was evenly distributed by class level with 603 undergraduate students (81.8%) and 131 graduate students (17.8%) (Three students did not report class level). Each of the eight colleges was proportionately represented. Utilization of this quota sampling procedure ensured that these proportions mirrored well the student population on the test campus. Based on the South Oaks Gambling Screen (SOGS), responding students were then classified as either non-problem gamblers (which encompasses non-gamblers), probable problem gamblers, or probable pathological gamblers based on responses recorded in the classification section of the survey questionnaire.

Results

As shown in table 1, roughly half (46.8%) of all students in the sample have gambled in a casino within the past twelve months. Among younger students (under 21 years of age), nearly one-third (32.2%) had done so. This is significant, since California state law allows players as young as 18 years old to engage in casino gambling, in contrast to the law in many other states. California, Florida, Georgia, Idaho, Michigan, Minnesota, Montana, Oklahoma, Oregon, Puerto Rico, Rhode Island, and Washington all allow some type of casino gambling to players 18 and older. In California, if alcohol is served on the casino floor, guests must be 21 to gamble. Although not directly assessed, these results question if this standard is effectively enforced.

Casino Gambling Experience	20 and under	21 and over	Total
Have Never Gambled	187 (67.8%)	204 (44.4%)	391 (53.2%)
Have Gambled	89 (32.2%)	255 (55.6%)	344 (46.8%)
Total	276 (100.0%)	459 (100.0%)	735 (100.0%)

Table 1: Casino gambling participation by age.

Consistent with prior research students were categorized based on their responses to the SOGS to identify probable problem and pathological gamblers. The results in this study are shown in table 2. As noted earlier, Volberg et al., [10] had found that counties in southern California with tribal casinos had the highest levels of problem and pathological gambling, at 4.5% or higher (compared to the majority of California which displayed levels of 2.9 to 4.3%). In this study the overall level of was as follows: non-problem gamblers (86.2%), probable problem gamblers (13.1%) and probable pathological gamblers (4.4%), for a total of 17.5% of the student sample exhibiting a probable gambling addiction. A chi-square test was performed to compare results to other studies. The overall distribution of gamblers is significantly different than reported by Nowak [12] (χ^2 (2, N= 735) = 82.56, p<0.01). The proportion of probable problem gamblers is considerably higher (13.3% vs. 6.1%), but the proportion of probable pathological gamblers is lower (4.4% vs. 10.2%). Overall, the sum of probable problem gamblers and probable pathological gamblers is slightly higher (17.5% vs. 16.3%), but these results are not significantly different (χ^2 (1, N= 735) =0.637, p=0.425). This suggests that the level of casino visitation by college students who may be attracted by proximity may foster high levels of problem gambling. Yet, the proportion of probable pathological gamblers is lower. Overall, the proportion of combined problem and pathological gamblers is higher than that found in prior studies [12]. Therefore, H1 is supported except for a lower incidence in our sample of pathological gamblers.

	Non-Problem Gamblers	Probable Problem Gamblers	Probable Pathological Gamblers
All Students	607 (82.6%)	96 (13.1%)	32 (4.4%)

Table 2: Student gambling classification/prevalence.

N=735

Prior research [8,17-21] suggests that males are more prone than females to gamble. That is supported by this study. As shown in tables 3 and 4, college males are more likely to be weekly gambles χ^2 (1, N= 798) =51.973, p=0.000 and more likely to be problem gamblers χ^2 (2, N= 735) =31.818, p=0.000. Therefore, H2 is supported.

Gender	Male	Female	Total
Non-Weekly Gamblers	254 (78.6%)	374 (96.1%)	628 (88.2%)
Weekly Gamblers	69 (21.4%)	15 (3.9%)	84 (11.8%)
Total	323 (100.0%)	389 (100.0%)	712 (100.0%)

Table 3: Gambling frequency by gender.

χ^2=51.973, df=1, p=.000

Gender	Non-Problem Gamblers	Probable Problem Gamblers	Probable Pathological Gamblers
Male	247 (74.0%)	66 (19.8%)	21 (6.3%)
Female	360 (89.8%)	30 (7.5%)	11 (2.7%)

Table 4: Gambling classification by gender.

N=735

χ^2=31.818, df=2, p=.000

As discussed above, prior research suggests that students who gamble are more likely to be heavier drinkers [8,26]. We surmised that students who are problem gamblers would be more like to agree with the statement "When I gamble, I usually drink alcohol". As shown in table 5 this was supported in this study χ^2 (8, N= 334) =16.436, p=0.037. Students who are problem gamblers were more likely to agree with that statement, supporting H3.

We hypothesized that students who are problem gamblers would be more likely to agree with the statement "The close proximity of casinos to campus increases my participation in gambling". As shown in table 6 this was supported in this study χ^2 (8, N= 335) =41.45, p=0.000. Students who are problem gamblers were more likely to agree with that statement, supporting H4.

We asked students to rate their degree of gambling enjoyment and risk of gambling. This was done using seven-point Likert scale. We compared the degree of agreement with those statements with an analysis of variance across Non-Problem Gamblers, Probable

Degree of Agreement	Non-Problem Gamblers	Probable or Problem Gamblers	Probable or Pathological Gamblers	Total
Strongly Agree	36 (13.5%)	14 (31.1%)	6 (27.3%)	56 (16.8%)
Agree	67 (25.1%)	9 (20.0%)	5 (22.7%)	81 (24.3%)
Neither Agree nor Disagree	65 (24.3%)	5 (11.1%)	4 (18.2%)	74 (22.2%)
Disagree	38 (14.2%)	3 (6.7%)	4 (18.2%)	45 (13.5%)
Strongly Disagree	61 (22.8%)	14 (31.1%)	3 (13.6%)	78 (23.4%)
Total	267 (100.0%)	45 (100.0%)	22 (100.0%)	334 (100.0%)

Table 5: Gambling classification and degree of agreement with statement "when I gamble, I usually drink alcohol".

χ^2=16.436, df=8, p=.037

Degree of Agreement	Non-Problem Gamblers	Probable or Problem Gamblers	Probable or Pathological Gamblers	Total
Strongly Agree	4 (1.5%)	5 (11.1%)	4 (18.1%)	13 (3.9%)
Agree	22 (8.2%)	8 (17.8%)	6 (27.3%)	36 (10.7%)
Neither Agree nor Disagree	53 (19.8%)	12 (26.7%)	6 (27.3%)	71 (21.2%)
Disagree	48 (17.9%)	6 (13.3%)	2 (9.1%)	56 (16.7%)
Strongly Disagree	141 (52.6%)	14 (31.1%)	4 (18.2%)	159 (47.5%)
Total	268 (100.0%)	45 (100.0%)	22 (100.0%)	335 (100.0%)

Table 6: Gambling classification and degree of agreement with "the close proximity of casinos to campus increases my participation in gambling".

χ^2=41.45, df=8, p=.000

	Non-Problem Gamblers	Probable Problem Gamblers	Probable Pathological Gamblers
Self-Reported Gambling Enjoyment	3.80	5.03	6.10
Self-Reported Risk of Gambling	2.25	3.23	4.81

Table 7: Gambling classification and enjoyment/risk of gambling.

Enjoyment=df=2, 737, Mean Square=66.74, F=24.00, p=.000

Risk: df=2, 737, Mean Square=72.59, F=22.41, p=.000

Problem Gamblers and Probable Pathological Gamblers. Enjoyment of gambling was significantly different across groups (F (2, 737) = 24.00, p=0.000) H3 was supported. Likewise, gambling risk was also significantly different across groups (F (2, 737) = 22.41, p=0.000). These results are shown table 7.

Discussion

In this study, we examined whether the proximity of multiple casinos affects problem gambling, and whether this differs based on gender. Moreover, we assessed whether students believed that casino proximity in fact increases their gambling behavior. We conducted this research with students living in a dense area with many tribal gaming casinos nearby. This is important to investigate as the number of tribal gaming casinos is increasing while commercial casinos are on the decline. While extant research has already examined the effect of casino proximity on problem gambling, the results have been mixed. Indeed, in their review of studies investigating this relationship, Tong and Chim [6] conclude that the evidence is inconclusive and that there may be a variety of additional factors that influence problem gambling. By examining several individual differences that have previously been found to predict problem gambling, show the effect of some of these other factors. Importantly, the finding that about half of our sample had gambled in a casino may be indicative that casino proximity does play some role in gambling behavior. However, this statistic alone does not indicate the extent to which casino proximity affects problem gambling.

Supporting our suppositions, the rates of problem and pathological gambling (combined) is higher in our sample to the general population as reported by Nowak [12]. We found rates of 17.5% in our sample, whereas the rates found by Nowak [12] were 16.3%. However, the proportion of problem and pathological gambling differed in our sample from that reported by Nowak [12]. While we found a much greater proportion of problem gambling (13.3% vs. 6.1%), we found a much lower proportion of pathological gambling (4.4% to 10.2%). From these results, we can conclude that casino proximity significantly affects problem and pathological gambling. However, the results are interesting. It may be that casino proximity affects problem gambling more than pathological gambling.

We also examined whether problem and pathological gambling differed by gender. In support of prior research [25], we found that males are significantly more likely to be problem or pathological gamblers than females. Thus, as would be expected, the effect of casino proximity on problem and pathological gambling appears to be especially strong for male students. Moreover, given extant research that links problem and pathological gambling with alcohol consumption, we investigated the connection in our sample. Results supported our hypothesis, finding that problem gamblers were more likely to agree with the statement, "When I gamble, I usually drink alcohol." While unsurprising, this finding is particularly troubling. Alcohol tends to lower inhibitions, which may increase the gambling that individuals

engage in by affecting their perceptions of likelihood of positive outcomes.

Finally, we are the first study to our knowledge to examine whether students believe that casino proximity increases their gambling behavior, supporting our hypothesis that those who are problem gamblers more likely to agree with statement, "The close proximity of casinos to campus increases my participation in gambling." This finding is indicative of a relationship between casino proximity and problem gambling. According to the Theory of Reasoned Action (TRA), behavioral beliefs play an important role in predicting behavior. Thus, the fact that problem and pathological gamblers hold the behavioral belief that proximity of casinos increases gambling behavior indicates that this is indeed an important factor determining their behavior. Moreover, although we did not specifically test normative beliefs around gambling, it is likely that the proximity of casinos increases college students' perceptions that gambling is a prevalent behavior. The third part of the TRA is perceived control. Although we did not gather any information to test this, it may be that college students perceive control over this behavior as they have wide access to it with the proximity of many gambling venues. We suggest this theoretical framework for scholars conducting future research on the influences on problematic gambling behavior. More specifically, future research might ask respondents about their perceptions on how prevalent gambling (specifically problem or pathological gambling) is among their peers. It may be that those reporting that they engage in problem or pathological gambling have greater perceptions of peers' engagement in these behaviors than what reality reflects.

While our study makes important contributions to the literature, it is not without limitations. First, due to the cross-sectional nature of our data, we cannot conclude a causal effect of relationships. However, we can conclude the concurrence of the two variables related. For example, we cannot say that being male causes greater problem and pathological gambling, but we can say that there is a greater incidence of problem and pathological gambling among males. We also do not have rates of student gambling prior to attending college at San Diego State University. Therefore, it is possible that students already gambled at similar levels prior to attending school near multiple casinos. Future research would benefit from a longitudinal design in which students are asked about current gambling behaviors upon entry to college as a base point, and then again later in their college career.

Policy recommendations

This study has important implications for public policy. Our study found significantly greater proportions of problem gambling. Indeed, we found 17.5% of respondents indicated behavior consistent with problem or pathological gambling, which is a troubling statistic in and of itself. This finding supports prior research finding a high prevalence of problematic gambling behavior among college students [1]. Moreover, approximately half of respondents indicated that they have gambled in a casino. This is troubling as it shows that gambling behavior takes place in casinos. Given the very numerous amount of casinos near the San Diego State University campus, it is clear that universities and greater local and state government should create policies related to casino location, especially since the strong presence of tribal gaming casinos, offering more types of games, is likely to draw many college students in who are looking for a fun place to gamble.

First, we recommend the establishment of a policy regarding gambling. Interestingly, despite the prevalence of on-campus gambling, only about twenty percent of U.S. colleges and universities have formal policies on gambling [2]. According to the TRA, individuals will engage in a behavior less to the extent that they see it producing negative outcomes [47]. Therefore, if policies exist that clearly outline negative repercussions for students engaged in gambling, this may reduce the behavior. However, it is important that these consequences be enforced rather than just threatened to make a marked difference in behavior.

In addition to policy, and perhaps even more important, is education around problematic gambling behavior. As discussed in the literature review, many students have positive perceptions of gambling, including that gambling can improve their image to other students [31,32]. This may be due to the perception that many other students and proximal targets (e.g., people living in the area) are gambling to a great extent. By providing comprehensive education about the risks and negative consequences of gambling, students may gain a clearer picture of the dangers of engaging in this unhealthy behavior. They may also learn that fewer of their peers are engaging in the behavior than they thought, decreasing the social pressure around gambling. Finally, it is important to address the finding that problem and pathological gamblers report alcohol consumption while gambling. Given that these are college students, it is likely that there are many problem gamblers who are engaging in illegal underage drinking.

Conclusion

This study shows that it is clear that gambling is a problematic behavior for many college students, especially for males. The results of our study confirm prior research that the presence of casinos nearby to campus can increase problematic gambling and highlight that the increasing presence of local tribal casinos may have an especially strong effect. While the rate of pathological gamblers in our study was lower than average, the incidence of problem gamblers was much greater, which indicates that location may strongly affect problem gambling. We propose that colleges implement a policy regarding gambling behavior of their students, as well as a comprehensive education program about problematic gambling.

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