

Research Note

## Gambling and Risk-Taking Behavior among University Students

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### ABSTRACT

The present study examines the relationships between risk taking, sensation seeking, and level of gambling involvement. The intent of this research was to investigate whether risk taking and/or sensation seeking are determinants in distinguishing pathological gamblers from problem gamblers and whether risk taking and gambling behavior for a university population are positively correlated for both males and females. Results indicated that the Risk-Taking Questionnaire (RTQ), the Arnett Inventory of Sensation Seeking (AISS), and the Sensation Seeking Scale (SSS) distinguished between probable/pathological gamblers and nonproblem gamblers with probable/pathological gamblers scoring the highest on each measure. However, the RTQ was the only measure able to distinguish probable/pathological gamblers from gamblers experiencing some problems relating to their gambling behavior. Females encountering some problems resulting from their gambling behavior consistently reported higher risk-taking and sensation seeking scores than males with no gambling problems. Results indicate that excessive gamblers are significantly greater risk takers than social gamblers, a finding which could prove useful in advising treatment regimens.

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*Key words.* Gambling; Problem gambling; Pathological gambling; Risk taking; Sensation seeking

## INTRODUCTION

Gambling is defined as "staking something of value on the outcome of an uncertain contingency" (Eadington, 1976), and can arguably be considered as one form of risk taking. Despite the monetary risks involved in gambling, a majority of North American citizens gamble at least on an occasional basis (Ladouceur et al., 1987). Prevalence estimates of those who gamble seem to be increasing. In 1974, 61% of the entire United States population was estimated to have gambled at some time in their life (Commission, 1976). Current North American estimates of adults who have gambled are reported as high as 92% in New Jersey, US (Volberg, 1994) and 93% in Alberta, Canada (Ladouceur, 1996). Current estimates of adult pathological gamblers are as high as 2.3% in Massachusetts, US (Volberg, 1996) and 1.7% in Nova Scotia, Canada (Ladouceur, 1996). Interestingly, however, Shaffer and Hall (1996), combined data from 7,700 adolescents in nine studies from five different regions in the United States, and Canada, and estimated the percentage of pathological gambling adolescents to range from 4.4 to 7.4%. See Table 1 for adult and adolescent prevalence studies in the United States and Canada.

Several trends seem to be emerging from these prevalence studies; the percentage of individuals choosing to gamble is increasing and a greater percentage of adolescents are pathological gamblers when compared to adults. Thus, pathological and problematic gambling is a growing concern, particularly for North American youth.

Given the obvious popularity of gambling, many researchers investigating gambling behavior are interested in delineating those factors which may distinguish pathological from social gamblers (Lesieur and Blume, 1987, 1990; Jacobs, 1988). One interesting area of research that may aid in further differentiating between social and pathological gamblers relates to risk-taking behavior. However, a suitable first step would be to define the terms social, problem, and pathological gambling. *Social gambling* is fairly straightforward and is representative of those gamblers who gamble with friends, for a limited period of time, with predetermined acceptable losses (APA, 1994). Generally speaking, *compulsive* and *pathological gambling* are synonymous terms (e.g., Shaffer and Hall, 1996). The DSM-IV (APA, 1994) defines pathological gambling as persistent and recurrent maladaptive gambling behavior as indicated by five (or more) of 10 criteria indexing gambling associated problem behaviors. *Problem gambling* is a term that is less well defined, and is essentially reserved for individuals who do not meet the criteria for pathological gambling, yet experience some problems

associated with their gambling activities. Problem gamblers are therefore often referred to as "at-risk" for developing into pathological gamblers (Winters et al., 1993; Wallisch, 1993), or "in transition" (i.e., moving toward or away from pathological gambling patterns) (Shaffer et al., 1994). Additionally, high scores on the South Oaks Gambling Screen (Lesieur and Bloom, 1987) represent "probable/pathological gambling," a term delineating a pattern of pathological gambling yet leaving a diagnosis per se to clinical diagnostic procedures.

Gambling and risk taking share many similar properties. The risk-taking construct is typically bound to age and gender; adolescents are greater risk takers than adults, and males are greater risk takers than females, regardless of age (e.g., Arnett, 1994; Zuckerman et al., 1978; Zuckerman, 1979). Until recently, risk taking in general has been investigated via the measurement of sensation-seeking behavior. However, there are varying conceptions of how to define and measure the similar constructs of sensation seeking and risk taking.

Zuckerman (1979) delineates sensation seeking as a trait defined by the need for varied, novel, and complex sensations and experiences. In contrast, Arnett (1994) suggests sensation seeking is marked by the need for novelty and intensity of stimulation in a wide variety of life experiences. Thus, Zuckerman (1971) developed the Sensation Seeking Scale (SSS), identified via four factors [e.g., Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (DIS), and Boredom Susceptibility (BS)], and was later refined (Form V) by Zuckerman et al. (1978) to include a total score. Arnett's analysis of sensation seeking led to the development of the Arnett Inventory of Sensation Seeking (AISS) with two subscales (e.g., Novelty and Intensity), and a total score as well. Predating the development of both the SSS and AISS, Knowles et al. (1973) investigated 13 different risk-taking measures and identified a motivational trait, interpreted as "a person's general willingness to approach or avoid risk situations (p. 123)." Their analysis lead to the development the Risk-Taking Questionnaire (RTQ) (Knowles, 1976a, 1976b, 1976c). See Table 2 for research investigations utilizing the SSS, AISS, and RTQ.

While gambling research has thus utilized risk taking and sensation seeking in their examinations of gambling behavior among varying populations (e.g., Anderson and Brown, 1984; Kulley and Jacobs, 1988; Knowles, 1976a, 1976b, 1976c), no study to present has examined risk-taking and sensation-seeking behavior across levels of gambling involvement. Furthermore, research investigating the association between gambling and risk taking has generally used either the SSS, AISS, or RTQ with generalizable results being difficult to interpret. Thus, this study will utilize the SSS, AISS, and RTQ in a multiple measure approach. To that end, the purpose of this study is to investigate whether risk taking and/or sensation seeking can aid in distinguishing the pathological from the social and problem gambler. It is likely that a positive linear relationship will be

Table 1.

Adult and Adolescent Gambling Prevalence Estimates: Selected Parameters and Studies<sup>a</sup>

Author/year data collected/country/state or province	Age group/number of participants	Type of gambling surveyed	Type data collected/instruments used/by whom	Scoring system and criteria	Type of data analysis	Results: percentage of lifetime gambling/current pathological gambling	Implications	Limitations
Volberg NI, published '95/ USA/GA	Adults aged 18+/ N = 1,550	Lottery, casino table games, gaming machines, dice and card games, parimutuel wagering, stock market activities, games of skill, and sports	Epidemiological data; demographic data from general population/SOGS/NI	Telephone survey; SOGS score 1-4 and ≥5 to designate problem and probable pathological gambler, respectively	Percentages and chi-square	74/1.6	Pathological gamblers were predominantly African-American males	Reliability of telephone survey responses
Volberg; '88-'90/ USA CA NJ MD MA IA Published '94	Adults aged 18+/ n = 1,250 n = 1,000 n = 750 n = 750 n = 750 N = 4,500	Lottery, casino table games, gaming machines, dice and card games, parimutuel wagering, stock market activities, games of skill, and sports	Epidemiological data; demographic data from general population and pathological gamblers entering treatment/SOGS/NI	Telephone survey; SOGS score 1-4 and ≥5 to designate problem and probable pathological gamblers, respectively	Percentages and chi-square	CA 89/1.2 NJ 92/1.4 MD 89/1.5 MA 90/1.2 IA 84/0.1	Link between availability of gambling and increases in gambling-related problems; gambling seen as societal problem	Reliability of telephone survey responses
Ladouceur; '89-'93/Canada PQ NB NS AB SK ON Published '96	Adults aged 18+/ n = 1,002 n = 801 n = 810 n = 1,803 n = 1,000 n = 1,200	Lottery, casino table games, gaming machines, card games, bingo, parimutuel wagering, sports wagering, and off-track betting	Epidemiological data/SOGS/NI	Telephone survey; SOGS score of 3-4 and ≥5 to designate problem (1-4 for Ontario) and probable pathological gamblers, respectively	Percentages	PQ 88/1.2 NB 87/1.37 NS 80/1.7 AB 93/1.4 SK 87/1.2 ON 67/0.9	Liberal attitude toward legalized gambling in Canada; liberal attitude and availability link to gambling-related problems	Modified version of SOGS used in Ontario
Lesieur et al. (1991)/NI, published '91/ USA NY NJ NV OK TX	University students/ n = 446 n = 227 n = 219 n = 583 n = 299 N = 1,771	Cards for money, horse and dog races, sports betting, dice, casino games, lottery, bingo, stocks, gaming machines, and games of skill	Review of individual provincial epidemiological surveys; demographic data/SOGS, and health survey/NI	Survey of randomly selected classrooms; SOGS score of 3-4 and ≥5 to designate problem and probable pathological gamblers, respectively	Percentages; correlations; multiple regression; gender differences	NY 90/8 NJ 92/6 NV 91/4 OK 78/5 TX 75/5 male pathological gamblers outnumbered females 4 to 1	Problem gambling higher in casino states and NY than in OK and TX; male pathological gamblers outnumbered females 4 to 1	Caution in generalizing from 6 universities in 5 states to nationwide university-age prevalence estimates
Ladouceur et al. (1994)/NI, published '94/ Canada/Quebec City metro area	College students/ N = 1,471	Cards for money, track and sports betting, dice, casino gambling, <sup>b</sup> lottery, bingo, stocks, gaming machines, games of skill	Epidemiological and demographic data; SOGS, and health survey/2 undergraduate and 1 graduate student (teachers present)	Questionnaire; SOGS score of 3-4 and ≥5 to designate problem and pathological gamblers, respectively	Percentages and correlations	90/2.8	Pathological gambling among university students twice as high as adults; gambling linked to alcohol and drug misuse and criminality	Study completed before casinos established in province; selective sample
Lesieur and Klein (1987)/NI, published 1987/ USA/NJ	High school seniors across NJ/N = 892	Participants questioned as to the forms of gambling they engaged in	Epidemiological and demographic data, problems from gambling; Pathological Gambling Signs Index <sup>c</sup> /NI	Questionnaire; ≥3 signs of pathological gambling designated pathological gamblers	Percentages and correlations	91/5.7	Found casino gambling among underage sample; pathological gambling exists among youth; need for education and counseling for pathological gambling in the schools	Lack of data supporting the extent to which gambling and preoccupation with gambling impact schooling
Shaffer and Hall (1996)/NI/5 different regions in the USA and Canada	High school and university age students/ N = 7,700	Meta-analysis of prevalence research. No specific gambling type examined	Prevalence findings/SOGS; SOGS-RA; MAGS; Pathological Gambling Signs Index; multifactor method/varied per study	Variable per measure used	Meta-analysis <sup>d</sup>	NI/4.4-7.4	Examined transition gamblers (i.e., problem gamblers moving toward or away from pathological gambling); possible natural recovery from pathological gambling while in transition from adolescence to adulthood	Meta-analytic findings, in the words of the authors, should be considered developmental

<sup>a</sup>NI = not indicated. MAGS = Massachusetts Gambling Screen for Adolescents. SOGS = South Oaks Gambling Screen. SOGS-RA = South Oaks Gambling Screen—Revised for Adolescents.

<sup>b</sup>Prior to legalized casino gambling in Quebec, Canada.

<sup>c</sup>DSM-III criteria.

<sup>d</sup>N of 7,700 includes Ladouceur et al. (1987, 1994); Lesieur and Klein (1987); Lesieur et al. (1991).

Table 2.

Previous Research Utilizing the Sensation Seeking Scale (SSS), Arnett Inventory of Sensation Seeking (AISS), and The Risk-Taking Questionnaire (RTQ)<sup>a</sup>

Study	Anderson and Brown (1984)	Kuley and Jacobs (1988)	Zuckerman et al. (1978)	Arnett (1994)	Knowles (1976a, b, c)
Country	UK	US	US and UK	US	US
Gambling-related study; Yes/No	Yes	Yes	No	No	Yes
Measures/scales	SSS/TAS, ES, DIS, and BS	SSS/TAS, ED, DIS, and BS	SSS/TAS, ES, DIS, and BS	AISS/Nov, Int; SSS/TAS, ES, DIS, and BS	RTQ/no scales
Participants/group comparisons	12 novice (aged 21–28) and 12 experienced gamblers (aged 28–40) (no mean age provided)	30 problem (mean age 33.2) and 30 social (mean age 33.4) gamblers	English: 72 males and 106 females (from Maudsley Twin Register) (aged 16 to 19). US: 97 males and 122 females (Temple University students)	139 adolescents (aged 16–18, 67 boys, 72 girls) and 38 adults (ages 41–59, 16 men, 22 women)	180 males 172 females (university age, no range or mean provided)
Findings	No significant sensation seeking differences between novice and experienced gamblers	Problem gamblers scored significantly higher on the SSS total score, ES, DIS, and BS scales than social gamblers	No significant total SSS differences between US and UK males; US females higher than UK on total SSS, TAS, and DIS; significant age decline for both males and females (e.g., TAS and DIS)	Adolescents scored higher than adults on total AISS and Int scale; boys higher than girls on total AISS, Int scale; men higher than women on total AISS, Int, and Nov	High risk-taking adults chose and wagered on riskier bets, judged situations as involving less risk, and preferred higher levels of subjective risk than low risk-taking adults
Implications/limitations	Lack of sensation seeking component relative to gambling behavior/Age confounded (i.e., novice gamblers younger than experienced gamblers) thus, calling lack of sensation seeking differences into question	Supports the contention that "excitement" and escape are major motives for gambling/lack of nongambling control group, as well as pathological gambling group	Cross-cultural support for males as greater sensation seekers than females, and decline in sensation-seeking scores from adolescence to adulthood/lack of younger age group to examine the possible curvilinear relationship with age; that is, increasing from childhood to adolescence, yet declining from adolescence to adulthood	Inverse relationship between sensation seeking and age, and males reporting higher sensation seeking than females for both adolescents and adults/lack of controls related to age and gender (i.e., age-matched and equal-n for group comparisons)	Support for the global construct of risk taking; existence of risk-taking component relative to gambling behavior/gambling situation was simulated, no indication if participants had gambled prior to the study, lack of significant findings relative to gender (i.e., male and female RTQ scores nonsignificant)

<sup>a</sup>TAS = Thrill and Adventure Seeking; ES = Experience Seeking; DIS = Disinhibition; BS = Boredom Susceptibility; Nov = Novelty; Int = Intensity.

found between level of gambling involvement and level of risk taking and sensation seeking, with probable/pathological gamblers reporting significantly greater risk taking and sensation seeking than social gamblers.

## METHODS

For the ease of the reader, the Methods section will be presented in tabular form. Refer to Table 3 for selected characteristics of the student sample and Table 4 for characteristics of the instruments utilized in this investigation (e.g., SSS, AISS, RTQ, and SOGS).

## RESULTS

Of the 63 subjects participating in this study, 58 (28 males, 30 females), or 92%, indicated having gambled during the past year. Of the 58 gamblers, 19% ( $n = 11$ ) (10 males, 1 female) were categorized as probable/pathological, 41% ( $n = 24$ ) (11 males, 13 females) as having some gambling problems, and 40% ( $n = 23$ ) (7 males, 16 females) as having no gambling problems. Means and standard deviations for the RTQ, SSS, and AISS total scales and subscales are presented for all students based upon level of gambling involvement (Table 5). Means and standard deviations for both males and females on the RTQ, SSS, and AISS total scales and subscales are presented for nongamblers as well as the three SOGS categorizations (Table 6). ANOVA results utilizing the RTQ, SSS, and AISS scales and subscales as dependent variables across the SOGS are presented in Table 7. ANOVAs relative to gender differences, as well as post-hoc analysis, are also presented in Table 7. Correlations are presented for the SSS, AISS, RTQ, and SOGS in Table 8.

## DISCUSSION

As hypothesized, probable/pathological gamblers reported significantly greater risk taking and sensation seeking behavior than gamblers exhibiting no gambling problems. As well, the RTQ differentiated probable/pathological gamblers ( $\geq 5$  on the SOGS) as significantly higher in risk taking than problem gamblers (1–4 on the SOGS). This is a significant finding in that no previous research has found risk taking to be a distinguishing factor when comparing pathological and problem gamblers. On the contrary, as Volberg (1996) states, "... individuals who score as problem gamblers and those who score as probable/pathological gamblers are now generally treated as a single group." Nevertheless, a progression in sensation seeking and risk taking was exhibited when comparing scores across the SOGS, whereas social gamblers with no problems reported the

**Table 3.**

*Methods: Characteristics of McGill University Student Sample and Procedures*

Year data collected	Age and number of participants	Type of sample	How student participants were engaged/procedures	Participants engaged by whom	Refusal rate
Winter 1996	Aged 18–35; mean age 22.4; 33 females and 30 males	Convenience	Students were engaged, across various departments at McGill University, via classroom introductions of the gambling investigation in general, and the problems associated with child and adolescent gambling specifically. Students were then given the option to sign up as prospective participants and were scheduled in 1-hour blocks. Flyers noting a “Gambling Study” were also posted across campus. A number of students signed up as participants via word-of-mouth from friends who had previously participated in the study. Participants first completed a questionnaire indicating whether they had gambled in the past 12 months. Participants who “never” gambled completed the SSS, AISS, and RTQ, yet not the SOGS. Gamblers’ SOGS scores were utilized to categorize no problem (0), some problem (1–4), and probable/pathological ( $\geq 5$ ) gamblers	Participants were engaged by one of three educational psychology Ph.D. students, two females and one male	The percentage of students who refused to participate following classroom introductions was not determined. 100% of the students who signed up participated in the study. 2 students refused to complete the questionnaire due to scheduling problems

**Table 4.**

*Methods: Characteristics of Risk-Taking, Sensation Seeking, and Gambling Involvement Instruments*

Name of instrument/author	Areas covered/number of items	Number of scales	Scoring	Reliability/validity findings	Average response time	Advantages/limitations
Sensation Seeking Scale (SSS)/ Zuckerman et al. (1978)	Need for varied, novel, and complex sensations and experiences/40 items	4 Scales: Thrill and Adventure Seeking (TAS); Experience Seeking (ES); Disinhibition (DIS); Boredom Susceptibility (BS). Ten items each, and one total score	Forced choice, 0 = No, 1 = Yes; higher scores indicate greater sensation seeking	Internal reliability ranged from .83 to .86 for SSS Total, and .56 to .88 for scales	20 minutes	Positive correlation with risk behaviors and problem gambling/ forced choice scoring format; items concerning strenuous physical activities (e.g., skiing and mountain climbing) calls the inverse relationship with age into question
Arnett Inventory of Sensation Seeking (AISS)/ Arnett (1994)	Need for novelty and intensity of stimulation in a wide variety of situations/20 items	2 Scales: Intensity and Novelty. Ten items each, and one total score	4-Point Likert scale; 1 = describes me very well, 4 = does not describe me at all. Six items worded negatively to avoid confirmation bias. Higher scores indicate greater sensation seeking	Internal reliability .70 for AISS Total/correlated with SSS Total .41	10 minutes	Sensation seeking declines with age; usefulness of sensation seeking as an explanatory factor with regard to risk behavior; suggests the need for intensity and novelty of experience is motivational toward norm-breaking and antisocial behaviors/small adult sample
Risk-Taking Questionnaire (RTQ)/Knowles (1976a)	Risk-approach and risk-avoidance motivation/20 items	One global total score	5-Point Likert scale; 1 = agree very much, 5 = disagree very much. Risk-avoidance items scored directly. Risk-approach items scored in reverse. Higher total score indicates greater risk-approach	Internal reliability ranged from .85 to .86/concurrent validity ranged from .67 for self-ratings of risk taking to .73 with performance on the SSS Total	10 minutes	Differentiation of risk-approach and risk-avoidance individuals/redefinition of risk taking as an approach-avoidance trait comes solely from factor analysis
South Oaks Gambling Screen (SOGS)/ Lesieur and Blume (1987)	Presence or absence of pathological gambling/20 items	One global total score indicating either no problems, some problems, or pathological problems associated with gambling activities <sup>b</sup>	A total score is derived via summation of positive responses: 0 = no problems, 1–4 = some problems, and $\geq 5$ = probable pathological gambling associated with gambling activities	Internal reliability .97/Test-Retest correlations for outpatient and inpatients 1.00 and .61, respectively	10 minutes	Differentiation of social gamblers with some and no problems and pathological gamblers; wide use in epidemiological studies/ problem gambling category indicates no progression (i.e., moving toward or away from pathological gambling)

<sup>a</sup>Arnett (1994).

<sup>b</sup>Probable pathological, leaving pathological gambling for a clinical diagnosis.

**Table 5.**  
Means and Standard Deviations for All Participants on the Risk-Taking Questionnaire (RTQ), Sensation Seeking Scale (SSS), and Arnett Inventory of Sensation Seeking (AISS) across the South Oaks Gambling Screen (SOGS)

Measure	Gambling involvement			
	No problem (N = 5)	Some problems (SOGS = 0, N = 23)	Probable pathological (SOGS = 1-4 N = 24)	Nongambler (SOGS = ≥5, N = 11)
RTQ total <sup>a</sup>	M = 46.40 SD = 10.31	M = 50.17 SD = 8.86	M = 57.88 SD = 10.55	M = 64.09 SD = 9.50
SSS total: <sup>b</sup>	M = 14.40 SD = 6.02	M = 18.68 SD = 8.16	M = 21.91 SD = 4.53	M = 23.63 SD = 6.42
Thrill and Adventure Seeking	M = 5.20 SD = 2.16	M = 5.04 SD = 3.42	M = 8.09 SD = 1.73	M = 7.27 SD = 1.68
Experience Seeking	M = 5.00 SD = 2.34	M = 5.41 SD = 2.46	M = 5.78 SD = 1.90	M = 5.45 SD = 2.02
Disinhibition	M = 2.20 SD = 1.30	M = 4.32 SD = 2.68	M = 4.65 SD = 2.17	M = 5.73 SD = 2.49
Boredom Susceptibility	M = 2.00 SD = 2.00	M = 3.91 SD = 1.97	M = 3.48 SD = 1.90	M = 5.09 SD = 2.66
AISS total: <sup>c</sup>	M = 49.40 SD = 7.50	M = 52.18 SD = 7.97	M = 57.83 SD = 6.40	M = 58.91 SD = 7.09
Intensity	M = 22.60 SD = 5.32	M = 23.90 SD = 5.12	M = 28.25 SD = 4.38	M = 28.54 SD = 4.31
Novelty	M = 26.80 SD = 3.03	M = 28.27 SD = 4.75	M = 28.58 SD = 3.99	M = 30.36 SD = 3.58

<sup>a</sup>RTQ Norms (mean = 59.42), from an adult sample.  
<sup>b</sup>SSS Norms (male mean = 21.6, female mean = 19.6).  
<sup>c</sup>AISS Norms (adult mean = 45.89, adolescent mean = 54.52).

least number of sensation-seeking and risk-taking behaviors and probable/pathological gamblers reported the most. Analysis of the SSS and AISS Intensity and Thrill and Adventure Seeking subscales revealed significant differences when comparing probable/pathological and problem gamblers to gamblers encountering no gambling-related problems. These SSS and AISS findings support previous research (Kuley and Jacobs, 1988) in that problem gamblers were significantly greater sensation seekers than social gamblers.

Another interesting finding is revealed when examining female problem gamblers; they are strikingly similar to male gamblers with no problems. Thus, females scoring high in sensation seeking and risk taking may be at risk for later encountering significant problems associated with their gambling behaviors.

**Table 6.**  
Means and Standard Deviations for Male and Females on the Risk-Taking Questionnaire (RTQ), Sensation Seeking Scale (SSS), and Arnett Inventory of Sensation Seeking (AISS) across the South Oaks Gambling Screen (SOGS)

Measure	Gambling involvement							
	Nongamblers		No problems		Some problems		Probable pathological	
	Male	Female	Male	Female	Male	Female	Male	Female
RTQ	M = 51.50	M = 43.00	M = 48.43	M = 50.94	M = 62.94	M = 53.85	M = 65.60	M = 49.00
Total	SD = 12.02	SD = 9.85	SD = 10.16	SD = 8.47	SD = 8.64	SD = 10.61	SD = 8.51	SD = <sup>a</sup>
SSS <sup>b</sup>	M = 19.00	M = 11.33	M = 18.43	M = 18.80	M = 25.00	M = 19.54	M = 24.60	M = 14.00
Total	SD = 1.41	SD = 6.03	SD = 6.85	SD = 8.92	SD = 3.62	SD = 3.71	SD = 5.87	SD = <sup>a</sup>
TAS	M = 5.50	M = 5.00	M = 5.71	M = 4.73	M = 8.60	M = 7.69	M = 7.69	M = 4.00
	SD = 2.12	SD = 2.65	SD = 3.25	SD = 3.58	SD = 1.35	SD = 1.93	SD = 1.35	SD = <sup>a</sup>
ES	M = 6.50	M = 4.00	M = 4.57	M = 5.80	M = 6.90	M = 4.92	M = 5.50	M = 6.00
	SD = 0.71	SD = 2.65	SD = 1.72	SD = 2.70	SD = 1.85	SD = 1.50	SD = 2.12	SD = <sup>a</sup>
DIS	M = 3.00	M = 1.67	M = 4.14	M = 4.40	M = 5.70	M = 3.69	M = 6.10	M = 2.00
	SD = 0.00	SD = 1.53	SD = 2.54	SD = 2.82	SD = 2.00	SD = 1.93	SD = 2.28	SD = <sup>a</sup>
BS	M = 4.00	M = 0.67	M = 4.00	M = 3.87	M = 3.80	M = 3.23	M = 5.40	M = 2.00
	SD = 1.41	SD = 0.58	SD = 2.52	SD = 1.77	SD = 2.10	SD = 1.79	SD = 2.59	SD = <sup>a</sup>
AISS <sup>c</sup>	M = 50.00	M = 49.00	M = 53.57	M = 51.53	M = 61.18	M = 55.00	M = 60.00	M = 48.00
Total	SD = 14.14	SD = 3.46	SD = 5.13	SD = 9.09	SD = 6.43	SD = 5.02	SD = 6.43	SD = <sup>a</sup>
INT	M = 22.00	M = 23.00	M = 25.29	M = 23.27	M = 30.27	M = 26.54	M = 29.20	M = 22.00
	SD = 9.90	SD = 2.65	SD = 4.82	SD = 5.28	SD = 4.43	SD = 3.67	SD = 4.02	SD = <sup>a</sup>
NOV	M = 28.00	M = 26.00	M = 28.29	M = 28.27	M = 30.91	M = 28.46	M = 30.80	M = 26.00
	SD = 4.24	SD = 2.65	SD = 4.86	SD = 4.88	SD = 4.43	SD = 4.07	SD = 3.46	SD = <sup>a</sup>

<sup>a</sup>Only one probable/pathological female gambler.

<sup>b</sup>SSS: TAS = Thrill and Adventure Seeking subscale; ES = Experience Seeking subscale; DIS = Disinhibition subscale; BS = Boredom Susceptibility subscale.

<sup>c</sup>AISS: INT = Intensity subscale; NOV = Novelty subscale.

Table 7.

Analysis of Variance and Post Hoc Results for the SSS, AISS, and RTQ Total Scores, Scale Scores, and Gender Differences across the SOGS<sup>a</sup>

Scale	Dependent variable	Degrees of freedom	F Ratio	p	Tukey's HSD
Sensation Seeking Scale (SSS)	Total	NS	—	—	—
	TAS	2,53	8.39	.001	PPG & SP > NP; $p < 0.001$
	ES	NS	—	—	—
	DIS	NS	—	—	—
	BS	NS	—	—	—
Arnett Inventory of Sensation Seeking (AISS)	Gender (males > females)	1,50	4.16	.047	NA
	Total	2,54	4.79	.012	PPG & SP > NP; $p < 0.001$
	Int	2,54	6.07	.004	PPG & SP > NP; $p < 0.001$
	Int	2,54	6.07	.004	PPG & SP > NP; $p < 0.001$
	Nov	NS	—	—	—
Risk-Taking Questionnaire (RTQ)	Gender (males > females)	1,51	5.87	.019	N/A
	Total	2,55	8.40	.001	PPG > SP; $p < 0.01$ SP > NP; $p < 0.01$
	Gender (males > females)	1,52	4.15	.047	NA

<sup>a</sup>NS = nonsignificant; NA = not applicable; TAS = Thrill and Adventure Seeking; ES = Experience Seeking; Disinhibition; BS = Boredom Susceptibility; Int = Intensity; Nov = Novelty; PPG = Probable/Pathological Gambler; SP = Some Problem Gambler; NP = No Problem Gambler.

Table 8.

Correlations for the Risk-Taking Questionnaire (RTQ), Sensation Seeking Scale (SSS), Arnett Inventory of Sensation Seeking (AISS), and the South Oaks Gambling Screen (SOGS)

Measure	RTQ	SSS	AISS	SOGS
RTQ	1.00			
SSS	.57***	1.00		
AISS	.55***	.78***	1.00	
SOGS	.48***	.29*	.36**	1.00

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

However, conclusions can't be drawn when comparing reports of the probable/pathological female group given there was only one participant in the group.

Although there was a linear progression in sensation seeking across level of gambling involvement, the findings that the SSS and AISS measures were unable to statistically distinguish probable/pathological and problem gamblers could be attributed to how Zuckerman and Arnett define sensation seeking. Whereas Zuckerman emphasizes the need for varied, novel, and complex sensations and experiences, Arnett stresses novelty and intensity of stimulation. Thus, pathological gamblers may have once experienced greater intensity, but as they became more familiar with their gambling activities, the sensations and stimulation lost their salience and became habituated. This, however, may have little to do with gambling as risk taking. Elia and Jacobs (1993) contend that increased familiarity with, and exposure to, games of chance lead to an increase in the level of risk taking. Ladouceur et al. (1987) also found that prolonged participation in gambling was associated with increased risk taking in order to maintain physiological arousal. In other words, pathological gamblers may have increased their risk taking, while experiencing similar levels of stimulation. Pathological gamblers may, in order to continue to reach some valued level of stimulation, take greater risks, thus raising their stakes. As Kuley and Jacobs (1988) note, a higher frequency of gambling and larger bet sizes appear to be consistently associated with higher sensation-seeking scores (p. 205).

Gambling, by its very definition, is undoubtedly a form of risk taking, and can also be seen as a form of sensation seeking. RTQ, SSS, and AISS correlations offer insight. First, the highest correlations are between the SSS and AISS (.78) and therefore appear to be measuring similar constructs. Second, the RTQ positively correlates with the SSS and AISS at .57 and .55, respectively, and third, the SOGS correlates highest with the RTQ (i.e., .48), as compared to the SSS and AISS (i.e., .29 and .36, respectively). This suggests that sensation seeking does

not follow the same progression as risk taking across increasing levels of gambling involvement. Further evidence that gamblers increase their risk-taking as they become more involved in gambling activities, yet while sustaining similar levels of sensation seeking.

This study has a few notable weaknesses. The small sampling size limits its generalizability. The sampling procedure (i.e., class introductions and flyers referring to a "Gambling Study") attracted a disproportionate number of volunteers with a bias toward enjoying gambling. Although the percentage of probable/pathological gamblers was high (i.e., 17% of the sample), this provided an opportunity to investigate differences across level of gambling involvement. However, with only one probable/pathological female, gender comparisons were limited.

This research yielded results that indicate males to be greater risk takers than females, yet female problem gamblers reported greater risk taking and sensation seeking than nonproblem males. In addition, the similarity of scores when comparing probable/pathological and problem gamblers on both the SSS and AISS total scales indicates a possible risk factor for individuals approaching pathological levels, and thus could be informative for treatment of problem gamblers as well as probable/pathological gamblers. Given the participants' reportedly increasing need for intensity of stimulation, gambling could be replaced with activities offering similar levels of stimulation (e.g., snow and water skiing, scuba diving, mountain climbing).

The importance of this research lies first in the approach utilizing multiple risk-taking and sensation-seeking measures. Second, the RTQ appears to be an applicable measure for gambling research, and further, represents a measure sensitive to distinguishing problem and probable/pathological gamblers. Third, all three risk-taking and sensation-seeking measures were able to differentiate between the "some problem" and "no problem" gamblers, whereas problem gamblers reported significantly more risk-taking and sensation-seeking behaviors than gamblers reporting no gambling-associated problems. Fourth, female and male gamblers are strikingly similar when the focus is on their reported risk-taking and/or sensation-seeking behaviors.

Implications for future research point to the utilization of multiple measures in combination with a longitudinal approach. In this way, researchers could investigate the contention that similar levels of stimulation may exist among gamblers who move from encountering some problems to pathological levels in their gambling involvement while increasing their risk-taking behavior.

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## RESUMEN

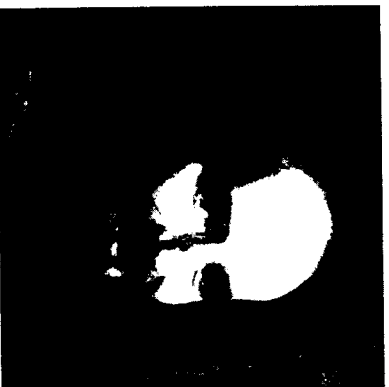
El presente estudio examina la relación entre: toma de riesgo, búsqueda de sensación y nivel de compromiso en apuestas. El propósito de este proyecto ha sido de investigar si la toma de riesgo y la búsqueda de sensación son determinantes en distinguir entre apostadores patológicos e individuos con problema de apuestas. Y si la toma de riesgo y el comportamiento de apuestas en una población universitaria se correlacionan positivamente en ambos, hombres y mujeres. Los resultados de este estudio indican que el cuestionario: "Risk-Taking Questionnaire" (RTQ), el inventario: "Arnett Inventory of Sensation Seeking" (AISS), y la escala: "Sensation Seeking Scale (SSS) hacen distinción entre apostadores patológicos y apostadores sin problema. Obteniendo los posibles apostadores patológicos el mas alto puntaje en cada medida. El RTQ fue siembargo lá unica medida capáz de distinguir entre posibles apostadores patológicos y apostadores manifestando problema relacionados con el comportamiento de apuestas. Las mujeres con problemas relacionados con el comportamiento de apuestas; reportaron un riesgo mas alto en los puntajes de toma de riesgo y busqueda de sensación, que los hombres sin problema de apuesta. Estos resultados indican que los apostadores excesivos toman riesgos muchismo mas grandes que los apostadores sociales dichos resultados son útiles para enfoques de tratamiento.

## RÉSUMÉ

L'étude examine la relation entre la prise de risque, la recherche de sensation et le niveau d'engagement dans le jeu. Plus particulièrement, il s'agit de voir si la prise de risque et la recherche de sensation permettent de différencier les joueurs-problème des joueurs pathologiques ainsi quie vérifier s'il y a corrélation entre la prise de risque et le comportement de jouer chez des étudiants universitaires,

hommes et femmes. Les résultats démontrent que le Risk-Taking Questionnaire (RTQ), le Arnett Inventory of Sensation Seeking (SSS), et le Sensation Seeking Scale (SSS) permettent de distinguer les joueurs pathologiques des joueurs sans problèmes, les premiers obtenant des résultats plus élevés à chacun des instruments. Toutefois, le RTQ est le seul instrument capable de discriminer entre les joueurs pathologiques et les joueurs ayant quelques problèmes seulement. Les femmes ayant seulement quelques problèmes de jeu se démarquent des hommes sans problèmes de jeu car leurs résultats okys élevés aux mesures de prise de risque et de recherche de sensation. Les résultats des joueurs pathologiques sont significativement plus élevés aux mesures de prise de risque que les joueurs sans problèmes, suggérant ainsi quelques pistes au niveau du traitement.

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#### Note

## Substance Use by Spanish University Students

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#### ABSTRACT

The major studies investigating substance use among Spanish university students are reviewed, their results and limitations noted, and current and future substance use trends are discussed.

**Key words.** Substance use; Substance use patterns; Substance use trends

#### BACKGROUND

Spain is situated in the South of Europe and, according to the 1991 census, has a population of 38,872,279 inhabitants, of which 19,835,842 are women and 19,036,437 are men. Spain is divided into 17 regions (known as Autonomous Communities) including the cities of Ceuta and Melilla. Although there is a central government, each Autonomous Community enjoys great autonomy in various aspects; for instance, education and health care.

The educational system in Spain is public and private, and is free for 3-18 year olds who attend state schools. Education is compulsory from 6-16 years of age. In recent years the number of students has decreased due to a decrease in the birth rate in the last 15 years (Spain has one of the lowest birth rates among the developed countries). However, the number of students going to universities is still increasing. Generally, those who want to go to a university can do so.