

The Relationship of Impulsivity, Sensation Seeking, Coping, and Substance Use in Youth Gamblers

Lia Nower
University of Missouri—St. Louis

Jeffrey L. Derevensky and Rina Gupta
McGill University

This study examines the relationship of impulsivity, sensation seeking, coping, and substance use to disordered gambling in a sample of 1,339 youth (637 males and 702 females), 17–21 years old. Results indicate that males with serious gambling problems were more likely than their peers to abuse substances and to use avoidant stress-coping strategies, such as seeking emotional outlets, distracting themselves with other activities, and using humor. In contrast, female disordered gamblers were less likely to engage in active coping and planning strategies. Overall, substance use, coping through distraction, and impulsivity proved the most predictive of disordered gambling for males, and intensity seeking and impulsivity proved most predictive for females. Implications for prevention, intervention, and education are discussed.

The increasing recognition of pathological gambling as a public health issue has fostered a growing concern over the gambling behavior of youth and resulting implications for future adult gambling. Studies suggest that 24%–40% of adolescents gamble weekly, 10%–14% are at risk for gambling problems, and 2%–9% meet diagnostic criteria for pathological gambling (for reviews of youth gambling, see Griffiths, 1995; Hardoon & Derevensky, 2002; Jacobs, 1993, 2000; National Research Council, 1999; Shaffer & Hall, 1996; Stinchfield & Winters, 1998). The mean prevalence rate for adolescent pathological gambling is estimated at 5.0%—more than three times the 1.5% average for adults (National Research Council, 1999).

Early gambling experiences around the age of 9 or 10 years appear to predict adult gambling problems (Dell, Ruzicka, & Palisi, 1981; Griffiths, 1990; Gupta & Derevensky, 1998a, 2000; Ide-Smith & Lea, 1988; Wynne, Smith, & Jacobs, 1996). In addition, youth who gamble excessively typically begin gambling at home with parents or other relatives (Gambino, Fitzgerald, Shaffer, Renner, & Courtage, 1993; Jacobs, 2000; Ladouceur & Mireault, 1988; Wood & Griffiths, 1998) or report parents who gamble problematically (Gambino et al., 1993; Gupta & Derevensky, 1998a, 1998b). As with adults, youth problem gamblers engage in delinquency; abuse cigarettes, alcohol, and drugs; and demonstrate significant impairment in family and peer relationships and social and school performance (Fisher, 1993; Giacobassi, Stitt, & Vandiver, 1998; Gupta & Derevensky, 2000; Ladouceur, Dube, & Bujold, 1994; Winters, Stinchfield, & Fulkerson, 1993).

Findings from adult gambling research have inspired recent explorations of the risk and resiliency factors that contribute to the development of youth problem gambling (Gupta & Derevensky, 1998a, 1998b, 2000). Because pathological gambling is characterized by the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association [APA], 2000) as a disorder of impulse control, it follows logically that a tendency toward impulsive behavior, particularly the inability to delay gratification and act with forethought, could predispose individuals to problem gambling. Similarly, gambling often involves a high degree of sensory and mental stimulation, raising the likelihood that individuals who seek intense and possibly novel forms of sensation could also prove at risk for developing gambling problems.

Several studies have reported high levels of sensation seeking in adult pathological gamblers (Anderson & Brown, 1984; Brown, 1986; Coventry & Brown, 1993; Kuley & Jacobs, 1988), although findings have been mixed (see Blaszczynski, Wilson, & McConaghy, 1986; Dickerson, Hinchey, & Fabre, 1987) and difficult to interpret because of the use of small samples of males in treatment facilities and a limited number of gambling venues.

In youth, elevated levels of sensation seeking have been historically linked to reckless driving (Arnett, 1996; Arnett & Jensen, 1994), risky sexual behavior (Arnett & Jensen, 1994; Wagner, 2001), drug use (Hansen & Breivik, 2001; Piko, 2001), and antisocial behaviors (Hansen & Breivik, 2001); however, few studies have explored the relationship between sensation seeking and gambling. In a study of 58 college-age gamblers, Powell, Hardoon, Derevensky, and Gupta (1999) reported that problem and pathological gamblers scored considerably higher than their peers on two forms of sensation seeking: thrill-and-adventure seeking and intensity seeking. Similarly, Gupta and Derevensky (1998b) found that youth ages 12 to 17 who reported serious gambling problems likewise manifested higher levels of disinhibition, leading the authors to hypothesize that these gamblers are utilizing stimulating environments, in part,

Lia Nower, Department of Social Work, University of Missouri—St. Louis; Jeffrey L. Derevensky and Rina Gupta, International Centre for Youth Gambling Problems and High-Risk Behaviors, McGill University, Montreal, Quebec, Canada.

Correspondence concerning this article should be addressed to Lia Nower, University of Missouri, 590 Lucas Hall, 8001 Natural Bridge Road, St. Louis, MO 63121-4499. E-mail: knowdice@umsl.edu

as a way "to self-correct a hypotonic physiological resting state" (p. 42).

In contrast to sensation seeking, elevated levels of impulsivity are noted consistently in studies of adult pathological gamblers (Alessi & Petry, 2003; Blaszczynski, Steel, & McConaghy, 1997; Carlton & Manowitz, 1994; McCormick, Taber, Kruegelbach, & Russo, 1987; Steel & Blaszczynski, 1996, 1998), with a few exceptions (e.g., Allcock & Grace, 1988). Studies with youth have confirmed adult findings, reporting in male adolescents significant correlations between high levels of impulsivity and gambling severity (Vitaro, Arseneault, & Tremblay, 1997), aggressiveness, anxiety (Vitaro, Arseneault, & Tremblay, 1999), delinquent behaviors, and substance abuse (Vitaro, Ferland, Jacques, & Ladouceur, 1998; Vitaro, Ladouceur, & Bujold, 1996).

Studies of sensation seeking and impulsivity to date have explored the relationship of these traits to problem gambling without regard to the possible moderating effects of other variables on this relationship. Research suggests, however, that problem youth gamblers use gambling as a means of coping with stress, avoiding or escaping from problems, alleviating boredom, and generating excitement that they perceive is missing from their lives (Getty, Watson, & Frisch, 2000; Gupta & Derevensky, 1998a, 1998b, 2000; McCormick, 1994). In addition, adult pathological gamblers in treatment who learn problem-solving techniques and social skills have greater success in completing therapy and avoiding relapse (Sylvain, Ladouceur, & Boisvert, 1997).

It is therefore theorized that youth who possess the necessary skills to evaluate and manage stressors competently, regardless of other personality variables, should handle stressful situations proactively without resorting to substance use, gambling, or other avoidant means or behaviors. In contrast, youth who lack those skills, particularly if they are innately impulsive or sensation seeking, might make rash and unwise decisions when confronted with stressful situations or seek various maladaptive means to avoid decision making altogether. Traditionally, such youth have been found more likely to abuse substances and to report higher levels of depression, anxiety, and neuroticism than those who confront stressors with an active, task-oriented approach (Ebata & Moos, 1991; Gomez, Bounds, Holmberg, Fullerton, & Gomez, 1999; Herman-Stahl, Stemmler, & Peterson, 1995; Hoffman, Levy-Shiff, Sohlberg, & Zarizki, 1992; Olah, 1995).

The principal aim of this study was to explore the relationship of sensation seeking, impulsivity, and stress-coping styles to gambling severity and to determine whether certain forms of coping moderate the relationship between the dispositional characteristics and problem gambling. To avoid possible overlap in the sensation-seeking and impulsivity constructs, this investigation will explore two distinct facets of sensation seeking, intensity seeking and novelty seeking, and one subtype of impulsivity, measuring the inability to plan, delay, or think before acting. Because prior research has indicated gender differences among youth gamblers (Gupta & Derevensky, 1998a, 1998b, 2000), the study sought to differentiate between males and females.

Method

Participants

Participants included in the study were 1,339 youth (637 males, 702 females) from five English-speaking junior colleges, who ranged in age

from 17 to 21 years ($M = 18.2$ years, $SD = 1.1$ year). The schools were representative of a stratified sample of communities in the greater Montreal, Quebec, Canada, area. To ensure stratification with respect to age, gender, and academic achievement level, participants were recruited from upper and lower division courses and from classes with high numbers of males and females in attendance. The original sample consisted of 1,381 students. Of these, 7 declined to participate and 35 either failed to complete the questionnaire or returned incomplete or invalid protocols, leaving a response rate of 97.1%. The distribution of the sample with respect to gender and age is provided in Table 1.

Measures

The present study used instruments measuring gambling and substance use problem severity, impulsivity, sensation seeking, gambling behavior, and stress-coping styles. Since stress-coping was a new construct for exploration with youth gamblers, two coping instruments were selected to investigate the construct more thoroughly: the Coping Inventory of Stressful Situations (CISS; Endler & Parker, 1990a, 1990b), which measures global domains of coping, and the Coping Orientations to Problems Experienced (COPE; Carver, Scheier, & Weintraub, 1989), which provides a variety of specific subscales about preferred coping strategies.

DSM-IV-J (Fisher, 1992). This 12-item instrument with 9 scored items is a youth gambling screen patterned after the *DSM-IV* (APA, 1994) criteria for pathological gambling. The *DSM-IV-J* has been found to effectively discriminate pathological gambling in youth up to 21 years (Derevensky & Gupta, 2000; Fisher, 1992; Gupta & Derevensky, 1998a, 1998b; Powell et al., 1999). The classification scheme in the current study designates an additional category for "problem gamblers" to the three proposed by Fisher (1992, 1993). Frequencies and descriptive statistics were used to establish cutoffs that reflected the natural break in the distribution of scores. Internal consistency reliability was acceptable for a scale of this size (Cronbach's $\alpha = 0.73$). Statistical findings, combined with a theoretical interest in investigating subthreshold gamblers (three

Table 1
Level of Gambling Involvement by Gender and Age

Variable	Gambling groups				Total
	Nongambler	Social gambler	Problem gambler	Pathological gambler	
Gender					
Male					
<i>n</i>	102	461	31	43	637
%	16.0	72.3	4.9	6.8	100
Female					
<i>n</i>	150	523	17	12	702
%	21.4	74.5	2.4	1.7	100
Age					
17					
<i>n</i>	72	262	14	13	361
%	19.9	72.6	3.9	3.6	100
18					
<i>n</i>	101	387	22	21	531
%	19.0	72.9	4.1	4.0	100
19					
<i>n</i>	44	238	7	10	299
%	14.7	79.6	2.3	3.3	100
20					
<i>n</i>	20	63	1	8	92
%	21.7	68.5	1.1	8.7	100
21					
<i>n</i>	15	34	4	3	56
%	26.8	60.7	7.1	5.4	100

symptoms), informed the current classification: (a) nongamblers (no past-year gambling), (b) social gamblers (0 to 2 endorsed items), (c) problem gamblers (3 endorsed items), and (d) probable pathological gamblers (4+ items endorsed).

Gambling Activities Questionnaire (Gupta & Derevensky, 1996). This questionnaire, which has been used in numerous studies by Gupta and Derevensky (1998a, 1998b; Powell et al., 1999), measures descriptive information; age of gambling onset; and familial, environmental, and other factors related to gambling behavior.

Eysenck Impulsivity Scale (EIS), Narrow Impulsiveness subscale (Eysenck & Eysenck, 1977). This 13-item subscale measures the inability to plan, delay, or think before acting. It has good intercorrelations with other impulsivity measures and has been found to consistently identify a specific form of impulsivity that correlates with the personality trait of psychoticism.

Arnett Inventory of Sensation Seeking (AISS; Arnett, 1994). This 20-item self-report scale consists of two subscales, Intensity Seeking (the desire for intense sensory experiences) and Novelty Seeking (the quest for new, different, spontaneous experiences). The internal reliability coefficient of the total scale is .70 (Novelty Seeking subscale = .50, Intensity Seeking subscale = .64).

COPE. This 60-item self-report measure, composed of 15 scales of 4 items each, has been found to have adequate convergent and discriminant validity when compared to other coping measures (Clark, Bormann, Cropanzano, & James, 1995) and consistent psychometric properties when tested with both adolescents and young adults (Fontaine, Manstead, & Wagner, 1993; Phelps & Jarvis, 1994; Sica, Novara, Dorz, & Sanavio, 1997). The individual scales are not highly intercorrelated, and alpha reliability coefficients, computed for each scale, range from .45 to .92. The current study used 14 of 15 scales: Active Coping, Planning, Suppression of Competing Activities, Restraint, Use of Instrumental Social Support, Use of Emotional Social Support, Focus on and Venting of Emotions, Behavioral Disengagement, Mental Disengagement, Positive Reinterpretation and Growth, Denial, Acceptance, Humor, and Religious Coping. An experimental scale measuring substance use was omitted because of the inclusion of the Personal Experience Screening Questionnaire (PESQ; Winters, 1992).

CISS. This 66-item questionnaire measures three dimensional aspects of coping: Task-oriented coping, emotion-oriented coping, and avoidance-oriented coping, composed of two subscales, Distraction and Social Diversion. The CISS has undergone rigorous validation studies with adolescents, young adults, and adults, confirming its psychometric properties and construct validity. Six-week, test-retest correlations ranged from .51 to .73. Internal reliability coefficients ranged from the high .80s to low .90s.

PESQ, Problem Severity subscale. The current study used the 18-item past-year Problem Severity subscale of this 40-question alcohol-and-drug-abuse screen for youth through age 21. This subscale has a high internal reliability coefficient of .90-.91.

Procedure

Student participants were recruited through professors who volunteered their classes and distributed a letter, describing the purpose of the study and providing assurances of confidentiality. All students who agreed to participate were provided a paper-and-pencil survey (55 min), which was group administered in classrooms and/or school gymnasiums. Surveys were grouped by school without identifying students or classes. The primary researcher and an assistant were present at all times to supervise the data collection procedure and to answer questions.

Results

Univariate Analyses

Univariate comparisons between levels of gambling severity were performed for gender and age, as well as impulsivity,

sensation-seeking, substance use, and coping scores. Age proved nonsignificant in all univariate analyses and was therefore excluded from subsequent multivariate analyses. The *t* tests, analyses of variance (ANOVAS), and analyses of covariance (ANCOVAS) were used for continuous variables, and chi-square tests were used for categorical variables. Because a large number of variables were tested and there was intercorrelation between variables in the two coping scales, separate ANOVAS and ANCOVAS were performed to compare dispositional characteristics and coping variables across levels of gambling severity for the total group and by gender (Tabachnick & Fidell, 2000). Students' perception of parental substance use or gambling problems (parental disorders), ethnicity, and substance use problem severity (substance use) were used as control variables. Socioeconomic status was excluded because many students were unaware of family income. To investigate differences across gambling categories, separate one-way ANOVAs were performed on all coping scales and subscales of the CISS and COPE as well as on the Problem Severity subscale of the PESQ.

Of the total sample of 1,339 youth, 81.3% ($n = 1,088$) reported having gambled during the previous 12 months, with 17.9% ($n = 240$) gambling at least once per week. In addition, 4.1% ($n = 55$) met *DSM-IV-J* criteria for pathological gambling, whereas 3.6% ($n = 48$) approached the diagnostic threshold, endorsing three criteria on the *DSM-IV-J*. As indicated in Table 1, males were more likely to gamble than females, with 84.0% of males and 78.6% of females reporting having gambled within the past year, $\chi^2(1, N = 1,339) = 6.27, p = .01$. Males (25.6%) were more than twice as likely as females (10.8%) to have gambled regularly (at least once a week), $\chi^2(1, N = 1,339) = 49.64, p = .001$. Gender differences were particularly evident in the pathological gambling group, with 6.8% of males and 1.7% of females meeting the criteria for pathological gambling, $\chi^2(3, N = 1,339) = 21.55, p < .001$. There were no significant differences between groups by age.

Impulsivity. Consistent with prior research, there were significant differences in impulsivity across levels of gambling severity. For the total sample ($N = 1,339$), impulsivity increased with the degree of gambling involvement, $F(3, 1335) = 15.71, p = .001$. Bonferroni corrections indicated that pathological gamblers differed from nongamblers and social gamblers on the Narrow Impulsiveness subscale of the EIS. All post hoc analyses were conducted using the Bonferroni pairwise comparison at an alpha level of .05.

Additional analyses were performed using control variables as covariates. Impulsivity remained significant when controlling for gender and substance use problem severity (hereinafter, "substance use"), $F(5, 1333) = 31.68, p < .001$, and for gender, ethnicity, and parental disorders, $F(9, 1329) = 6.54, p < .001$. Impulsivity and other variables were compared by age to determine whether there were significant differences across gambling categories. All variables were nonsignificant, and as such, age was excluded from the analyses. Subsequent analyses were then performed to explore impulsivity by gender. The means and standard deviations by gender are reported in Table 2.

Notably, male nongamblers reported lower mean scores of impulsivity than all females, including nongamblers, and female problem or pathological gamblers scored higher in impulsivity than all males except nongamblers. Impulsivity was significant for

Table 2
Means and Standard Deviations by Gender and Gambling
Category for Impulsivity and Intensity Seeking

Variable	Males			Females		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Impulsivity						
Nongambler	101	4.51	3.42	150	4.85	3.12
Social gambler	462	5.52	3.17	523	5.49	3.12
Problem gambler	31	6.35	3.27	17	7.06	3.68
Pathological gambler	43	7.74	2.57	12	7.33	2.90
Intensity seeking						
Nongambler	101	26.12	4.57	150	23.22	4.08
Social gambler	462	26.87	4.05	523	24.32	3.95
Problem gambler	31	27.68	4.28	17	27.18	2.88
Pathological gambler	43	27.56	3.92	12	27.17	3.97

both males, $F(3, 633) = 11.13, p < .001$, and females, $F(3, 698) = 4.76, p < .001$.

There were no significant differences in impulsivity by gender within each category: nongamblers, $F(1, 250) = .68, p = .41$; social gamblers, $F(1, 982) = .02, p = .89$; problem gamblers, $F(1, 46) = .47, p = .50$; and pathological gamblers, $F(1, 53) = .23, p = .64$. However, it is important to note that there were only 12 female pathological gamblers in the sample.

Sensation seeking. Across levels of gambling involvement, intensity-seeking scores increased significantly, $F(3, 1335) = 31.36, p < .001$, but differences in novelty-seeking scores were nonsignificant, $F(3, 1335) = 1.31, p = .27$. Between groups, problem and pathological gamblers reported similar mean scores but significantly more intensity-seeking behaviors than nongamblers and social gamblers. Intensity seeking remained significant in subsequent analyses when controlling for gender and substance use, $F(5, 1333) = 87.58, p < .001$, and gender, ethnicity, and parental disorders group, $F(9, 1329) = 33.81, p < .001$.

Analyzed by gender, both male and female problem and pathological gamblers differed from nongamblers and social gamblers in intensity seeking (see Table 2). Male nongamblers, $F(1, 250) = 16.18, p < .001$, social gamblers, $F(1, 982) = 171.36, p < .001$, and problem gamblers, $F(1, 46) = 19.01, p < .001$, scored significantly higher than females, although pathological gamblers reported no significant differences, $F(1, 53) = .66, p = .42$. The Novelty Seeking subscale was nonsignificant across groups.

Stress coping. Overall, nongamblers reported higher mean scores than all gamblers on scales measuring forms of active, task-oriented coping. Between groups, nongamblers scored significantly higher than social gamblers on the Task-Oriented Coping scale (CISS), $F(3, 1335) = 3.86, p = .01$, and higher than all gamblers on the Active scale, $F(3, 1335) = 6.00, p < .001$, and the Planning scale, $F(3, 1335) = 8.39, p < .001$, of the COPE. Conversely, nongamblers scored significantly lower than other groups on scales measuring avoidance-oriented coping, including both the Social Diversion subscale, $F(3, 1335) = 3.32, p = .02$, and the Distraction subscale, $F(3, 1335) = 7.67, p < .001$, of the CISS and the Avoidance scale and the Denial scale of the COPE, $F(3, 1335) = 4.58, p = .01$.

Splitting the sample by gender yielded different results for males and females. Among males, problem and pathological gam-

blers were more likely than nongamblers and social gamblers to cope with stress by abusing substances, $F(3, 633) = 13.31, p < .001$; seeking emotional outlets, $F(3, 633) = 3.97, p = .01$; distracting themselves with other activities, $F(3, 633) = 12.02, p < .001$; and using humor, $F(3, 633) = 5.26, p < .001$. Similarly, pathological gamblers were more likely than nongamblers to avoid stress through social encounters, $F(3, 633) = 4.06, p = .01$; mental disengagement, $F(3, 633) = 3.52, p = .02$; and denial, $F(3, 633) = 3.72, p = .01$; and less likely to plan, $F(3, 633) = 13.31, p = .01$, in a stressful situation.

For females, only three coping styles differed significantly by gambling category: substance use, $F(3, 698) = 5.37, p = .01$; active coping, $F(3, 698) = 4.11, p = .01$; and planning, $F(3, 698) = 4.29, p = .01$. Nongamblers reported significantly more active coping and planning than social gamblers and were much less likely to abuse substances than social or problem gamblers. Though coping differences are minimal, it should be noted that the number of female problem gamblers ($n = 17$) and pathological gamblers ($n = 12$) was very small compared to nongamblers ($n = 150$) and nonproblem gamblers ($n = 523$). This disparity may have affected significance levels overall and between groups.

A series of ANCOVAs was then performed using control variables. Analyses on the total sample using gender, ethnicity, and parental disorders as covariates yielded only one difference from the prior analyses. Emotion-oriented coping (CISS)—a variable that had proven significant for males but not females—became significant for the group, possibly due to the covariate, "father with substance abuse problem," which differed significantly across groups, $F(9, 1329) = 13.74, p < .001$. Analyzing results by gender yielded results similar to those obtained without controls.

Multivariate Analyses

Multiple logistic regression was used to evaluate the relative contributions of predictor variables, which had proven significant in univariate analyses, to the likelihood of membership in disordered gambling categories. The predictor variables tested included impulsivity, intensity-seeking, substance use, and coping scales and subscales. Impulsivity, intensity-seeking, substance use, and coping scores were continuous variables, and all other variables were dummy coded. Age failed to prove significant in univariate analyses of any of the predictor variables; therefore, it was excluded from multivariate analyses as a control variable. The minimum criterion for entry of covariates in the model was a p value of less than .05. Partial odds ratios (ORs) and 95% confidence intervals (CIs) were computed for significant predictors. Model effects were estimated both by the improvement in chi square and by a classification matrix indicating the proportion of individuals correctly identified by the model covariates.

One important goal of this research was to begin to identify risk and protective factors that differentiate youth who gamble with no difficulties from those who develop gambling problems. Therefore, logistic regressions were run comparing gamblers who endorsed zero symptoms of pathology on the DSM-IV-J (referred to as "nondisordered," $n = 692$) with problem and pathological gamblers endorsing 3+ symptoms (referred to as "disordered," $n = 103$), for a total sample size of 795. Among males ($n = 371$), 297 were nondisordered gamblers and 74 were disordered gam-

blers, whereas for females ($n = 424$), 395 were nondisordered gamblers and 29 were disordered gamblers.

Since coping variables differed for males and females, separate forward selection logistic regression analyses for males and females were performed, entering in Block 1 intensity seeking, impulsivity, and only those coping variables that proved significant in prior analyses by gender. All possible interactions between the dispositional and coping variables were entered in Block 2, to determine which of the significant variables added most to the regression equation overall and which, if any, coping variables had a moderating effect on dispositional characteristics.

For males, results of the forward logistic regression indicated a good model fit, correctly classifying 81.0% of cases. Variables remaining in the equation are summarized in Table 3. The degree of impulsivity proved the largest predictor of membership in the disordered gambling group; impulsive males were 1.6 times more likely to have gambling problems. Males who abused substances or coped with distraction (avoidance) were about 1.1 times more likely than their peers to be disordered gamblers. There were no significant interactions between the dispositional and coping variables. The Hosmer-Lemeshow goodness-of-fit statistic also indicated that model fit was adequate, $\chi^2(8, N = 371) = 8.16, p = .42$.

A subsequent, exploratory regression using the same variables and adding the control variables of ethnicity and parental disorders into Block 1 yielded a slightly different model. A male who believed his father gambled too much was at 3.3 times greater risk of developing a serious gambling problem. The other predictor variables in the model remained essentially the same (see Table 3).

The analysis was repeated for females, and variables remaining in the equation are summarized in Table 4. Results of the forward logistic regression indicated a good model fit, correctly classifying 93.2% of cases. The Hosmer-Lemeshow goodness-of-fit statistic was also nonsignificant, $\chi^2(8, N = 424) = 6.53, p = .59$. For females, only intensity seeking and impulsivity proved significant predictors. Participants who were highly impulsive or intensity seeking were 1.2 times more likely to belong to the disordered gambling group. None of the interaction variables was significant.

As with males, an additional logistic regression was performed to explore the predictive effect of the perception of parental disorder on females with gambling problems. In this analysis, a female who believed her father abused substances was at 2.5 times greater risk of disordered gambling. The other predictors—impulsivity and intensity seeking—remained virtually unchanged from the prior analysis (see Table 4).

Table 3
Males: Logistic Regression Results ($N = 371$)

Predictor variable	B	SE	Wald χ^2	df	p	OR
Without control variables						
Substance use	0.12	0.03	12.68	1	.01	1.12
Distraction	0.07	0.02	7.69	1	.01	1.07
Impulsivity	0.47	0.15	10.49	1	.01	1.60
With control variables						
Substance use	0.12	0.03	13.73	1	.01	1.13
Distraction	0.06	0.02	6.48	1	.01	1.06
Impulsivity	0.49	0.15	11.05	1	.01	1.63
Gambling father	1.19	0.49	5.90	1	.02	3.28

Note. OR = odds ratio.

Table 4
Females: Logistic Regression Results ($N = 424$)

Predictor variable	B	SE	Wald χ^2	df	p	OR
Without control variables						
Intensity seeking	0.19	0.05	12.47	1	.01	1.21
Impulsivity	0.15	0.07	5.42	1	.02	1.17
With control variables						
Intensity seeking	0.18	0.05	11.57	1	.01	1.20
Impulsivity	0.15	0.07	5.15	1	.02	1.16
Substance-abusing father	0.93	0.47	3.81	1	.05	2.53

Note. OR = odds ratio.

Discussion

The current study found that both impulsivity and intensity seeking are highly predictive of problem gambling behavior in male and female youth. Of interest, female disordered (problem and pathological) gamblers reported higher impulsivity scores than all males except pathological gamblers, suggesting that these traits may warrant further exploration. In addition, both disordered male and female youth gamblers differed from their peers in their preference for strong, sensory stimulation (intensity seeking), though they demonstrated no significant affinity for seeking out new and diverse experiences (novelty seeking). This finding is consistent with a prior study (Powell et al., 1999) and corresponds to the nature and appeal of gambling, a highly repetitive but intensely stimulating activity that generates arousal and excitement and facilitates mental escape.

The role of stress-coping styles varied significantly by level of gambling involvement and gender. For males, nongamblers were much more likely than gamblers at any level to adopt active, task-oriented strategies for coping with stress. In contrast, disordered gamblers were more likely to avoid stressors by engaging in distracting behaviors and activities and/or by engaging in fantasy, denial, and substance use. Among females, coping styles had little predictive value except to suggest that an active, task-oriented approach may protect females from resorting to maladaptive behaviors in times of stress. As with males, female nongamblers engaged in significantly more active coping and planning than social gamblers and were less likely to abuse substances than either social or problem gamblers.

Although gambling has yet to be included in any stress-coping scale, prior research has suggested that gambling has a unique ability to foster mental dissociation and physiological arousal that is both behaviorally addictive and time consuming (Gupta & Derevensky, 1998b; Kuley & Jacobs, 1988). The results in this study with respect to males complement these findings, suggesting that disordered gamblers are likely to adopt avoidant coping styles that satisfy the need for escape and/or compensate for a deficit in active, task-oriented coping skills. When combined with a preference for repetitive and highly stimulating activities, this tendency toward avoidance renders these males particularly susceptible to developing gambling problems. With females, gambling problems appear to relate solely to high levels of impulsivity and intensity-seeking. However, there is some indication that adoption of active, task-oriented coping strategies may lessen the appeal of gambling for females. It is important to note, however, that the sample of

disordered female gamblers in this study was small and that serious gambling problems in females typically manifest in mid- to late-adulthood (Petry, 2002; Potenza et al., 2001). Thus, longitudinal research is needed to determine whether females who manifest gambling problems continue these behaviors into adulthood and to identify the additional risk factors that contribute to a later onset of gambling problems.

It is interesting to note that the study also found that the perception of parental disorders proved a powerful predictor of youth problem gambling for both males and females, highlighting the role of family modeling in the development of youth gambling problems. By implication, youth whose parents are avoidant may be more likely to adopt similar strategies and to engage in problematic behaviors. If those youth are also highly impulsive and/or intensity seeking, they will be at increased risk. Therefore, it is important for prevention and intervention efforts to target these youth with educational programs that assist in positively redirecting impulsive and intensity-seeking predilections, help to identify and eliminate the use of avoidant-oriented coping strategies, and teach the substitution and mastery of active, task-oriented approaches to problem solving.

The current study was hampered by common limitations in research using convenience samples, including sample selection and design. First, though the sample size was sufficiently large to detect meaningful relationships for males and for the total sample, the number of disordered female gamblers was small. Since little is known about female youth gamblers, more research is necessary to determine whether findings would be representative of other female youth. Second, participation was voluntary and limited to students enrolled in English-speaking junior colleges, thereby excluding dropouts, students who refused to participate or were absent from school, and students at exclusively French-speaking schools. The use of a cross-sectional design further limits the generalizability of the findings.

Despite these limitations, the study further establishes the importance of addressing impulsivity and intensity seeking in youth and fostering the use of active, task-oriented stress-coping styles. Additional research is needed to explore the effect of parental and peer stress-coping styles on youth, the coping styles of highly impulsive and/or intensity-seeking youth who demonstrate no pathological behaviors, and the outcomes of prevention and intervention programs that target coping and dispositional characteristics for intervention and education.

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