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Differences in the Associations between Gambling Problem Severity and Psychiatric Disorders among Black and White Adults: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions

Declan T. Barry, PhD,[1] Elina A. Stefanovics, PhD,[1] Rani A. Desai, PhD, MPH,[1,2,3] Marc N. Potenza, MD, PhD[1,3,4]

[1]Department of Psychiatry, Yale University School of Medicine, New Haven, Connecticut
[2]Department of Epidemiology and Public Health, Yale University School of Medicine, New Haven, Connecticut
[3]Women's Health Research at Yale, Yale University School of Medicine, New Haven, Connecticut
[4]Child Study Center, Yale University School of Medicine, New Haven, Connecticut

We examined differences in the associations of gambling problem severity and psychiatric disorders among a nationally representative sample of 32,316 black and white adults. Black respondents were more likely than white ones to exhibit problem or pathological gambling (PPG) and a stronger relationship between subsyndromal gambling and any mood disorder, hypomania, and any substance use disorder. Differences in the patterns of co-occurring disorders between syndromal and particularly subsyndromal levels of gambling in black and white respondents indicate the importance of considering race-related factors in mental health prevention and treatment strategies. (Am J Addict 2010;20:69–77)

INTRODUCTION

Findings from clinical and community-based studies suggest that gambling and gambling problems are common among different racial and ethnic groups in the United States and elsewhere.[1,2] Investigations in the United States have generally,[3–6] but not uniformly,[7] found that, in comparison to whites, blacks are more likely to experience problem or pathological gambling (PPG). For example, a recent study that examined ethnicity and race differences in lifetime prevalence rates of PPG from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) data found higher rates among black respondents (2.2%) in comparison to white ones (1.2%).[6]

Given the high co-occurrence of substance use, mood, anxiety, and personality disorders (PDs) with pathological gambling, the treatment for one condition should routinely involve screening and possible concomitant treatment for comorbid psychiatric disorders.[4,8] However, the importance of systematically examining the psychiatric morbidity that may accompany a continuum of problem gambling severity (such as recreational or low-risk gambling, at-risk gambling, and problem gambling in addition to pathological gambling) among different population subgroups (eg, gender, race) has been emphasized, and this focus is consistent with a public health approach to the study of gambling.[9–11] An increased understanding of racial differences among black and white adults concerning the prevalence of a range of problem gambling severity as well as associated psychiatric morbidity could help public health interventions as well as resource and program planning for gambling treatment programs.

The relatively few published studies that have examined race-related differences on gambling among blacks and whites have focused primarily on pathological or problem gambling and have not systematically examined the psychiatric correlates that may accompany recreational gambling. These studies have typically used lifetime (instead of past year) measures of pathological gambling and psychiatric disorders (eg, see Ref. 6). However, in comparison to lifetime measures, past-year measures are less likely to be

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The contents of this paper are solely the responsibility of the authors and do not necessarily represent the official views of the National Center for Responsible Gaming or the Institute for Research on Gambling Disorders or any of the other funding agencies. Address correspondence to Dr. Barry, Yale University School of Medicine, CMHC/SAC Room 220, 34 Park Street, New Haven, CT 06519-1187. E-mail: declan.barry@yale.edu.

TABLE 1. Sociodemographic characteristics of black and white respondents by gambling problem severity

	White respondents							Black respondents						
	NG		LRG		PPG			NG		LRG		PPG		
Characteristics	*N*/mean	%/SE	*N*/mean	%/SE	*N*/mean	%/SE	*p*	*N*/mean	%/SE	*N*/mean	%/SE	*N*/mean	%/SE	*p*
Gender							<.0001							<.0001
Male	6,928	43.6	3,802	58.6	68	68.2		1,862	39.5	1,001	54.6	33	51.1	
Female	10,431	56.4	3,157	41.4	42	31.8		3,897	60.5	1,052	45.4	43	48.9	
Marital status							<.0001							<.0001
Married	9,394	63.7	3,974	66.8	48	49.8		1,908	40.4	802	48.1	17	29.1	
Previously married	4,594	17.6	1,855	18.1	30	22.9		1,848	22.4	662	22.5	23	19.7	
Never married	3,371	18.8	1,130	15.1	32	27.2		2,003	37.1	589	29.4	36	51.3	
Education							<.0001							.52
Less than HS	2,096	11.5	787	10.8	18	15.9		1,241	19.6	425	19.5	22	22.2	
HS graduate	5,007	29.3	2,190	31.9	43	42.5		1,846	32.2	657	32.0	23	36.7	
Some college	5,197	30.5	2,283	32.9	35	28.1		1,713	32.1	642	32.8	22	33.2	
College or higher	5,059	28.7	1,699	24.4	14	13.4		959	16.1	329	15.6	9	7.9	
Employment							.0003							.25
Full time	8,554	51.4	3,664	55.8	63	55.5		2,953	53.9	1,114	57.2	35	43.7	
Part time	1,846	11.2	666	9.9	13	13.0		519	9.5	170	8.3	7	10.8	
Not working	6,959	37.5	2,629	34.3	34	31.5		2,287	36.6	769	34.5	34	45.4	
Age	46.4	.2	48.3	.3	41.7	2.1	<.0001	41.8	.3	44.5	.5	36.9	2.2	<.0001
Income	57,387	1,116.7	60,303	1,347.6	46,254	3,512.0	.0004	38,368	1,217.5	42,192	1,167.5	34,541	4,675.7	.013

Notes: NG = no gambling or low-frequency gambling group; LRG = low-risk or at-risk gambling group; PPG = problem or pathological gambling group.
*N*s represent actual number in each category; %s indicate weighted percentages.

TABLE 2. Prevalence of psychiatric diagnoses by gambling problem severity among black and white respondents

	White respondents							Black respondents						
	NG		LRG		PPG			NG		LRG		PPG		
Psychiatric diagnoses	*N*	%	*N*	%	*N*	%	*p*	*N*	%	*N*	%	*N*	%	*p*
Any Axis I disorder	6,855	40.2	3,888	56.7	95	82.9	<.0001	1,601	28.6	950	46.1	57	78.1	<.0001
Any mood disorder	1,699	9.5	722	9.8	30	24.3	.005	452	7.9	206	10.6	26	34.6	.0003
Major depression	1,384	7.7	539	7.2	23	15.9	.035	343	5.9	136	7.1	13	19.4	.038
Dysthymia	341	1.9	155	1.9	5	5.1	.4	100	1.7	36	1.8	7	11.2	.156
Mania	280	1.6	140	1.9	6	7.3	.064	74	1.0	47	2.8	13	17.8	.001
Hypomania	176	1.1	92	1.4	2	2.8	.139	56	1.1	45	2.4	1	.6	.02
Any anxiety disorder	1,980	11.3	958	13.5	35	30.6	<.0001	570	9.6	265	12.9	19	30.6	.002
Panic disorder w/or w/o agoraphobia	405	2.3	184	2.5	9	9.2	.137	85	1.3	43	2.1	1	2.4	.205
Social phobia	515	3.0	246	3.3	13	7.7	.116	103	1.7	54	2.9	3	6.4	.09
Simple phobia	1,220	7.1	639	9.1	24	21.1	<.0001	396	6.8	189	8.7	13	20.5	.023
Generalized anxiety disorder	400	2.1	172	2.4	9	8.9	.084	99	1.8	33	1.9	6	9.4	.269
Any substance use disorder	6,334	37.4	3,854	56.7	92	80.6	<.0001	1,253	22.6	883	43.3	47	56.4	<.0001
Alcohol abuse/ dependence	1,225	7.3	843	12.7	37	34.6	<.0001	244	5.0	188	10.6	18	22.5	<.0001
Drug abuse/ dependence	285	1.7	177	2.8	8	6.0	.0002	72	1.7	62	3.9	6	8.2	.004
Nicotine dependence	2,051	12.3	1,294	19.5	56	52.2	<.0001	481	8.6	294	14.5	23	25.4	.0001
Any Axis II disorder	2,320	13.6	1,286	18.5	58	51.1	<.0001	801	14.8	417	21.3	41	57.7	<.0001
Any Cluster A	934	5.2	479	6.6	27	24.9	<.0001	490	8.9	239	12.1	26	36.3	.0003
Paranoid	633	3.6	317	4.4	25	23.2	.0004	366	6.6	190	9.9	25	35.7	.0001
Schizoid	466	2.6	245	3.5	12	14.8	.001	237	4.5	116	5.6	15	24.1	.015
Any Cluster B	699	4.3	473	6.9	33	25.8	<.0001	211	4.3	159	8.7	21	31.6	<.0001
Histrionic	286	1.7	144	2.0	17	14.0	.0048	112	2.2	69	3.6	10	10.8	.015
Antisocial	477	3.0	367	5.5	24	20.6	<.0001	123	2.7	101	5.6	13	22.9	.0003
Any Cluster C	1,575	9.2	802	11.8	34	27.9	<.0001	466	8.3	218	11.4	26	35.2	.0004
Avoidant	466	2.6	152	2.2	11	8.7	.011	103	1.8	42	2.3	6	8.4	.118
Dependent	86	.6	34	.5	3	2.4	.33	20	.3	7	.3	4	3.7	.206
Obsessive-compulsive	1,288	7.7	710	10.4	32	25.6	<.0001	404	7.3	196	9.9	25	32.8	.0008

Notes: NG = no gambling or low-frequency gambling group; LRG = low-risk or at-risk gambling group; PPG = problem or pathological gambling group.

each contributing category in the Axis I (mood, anxiety, and substance use) and Axis II (clusters A, B, and C) in both blacks and whites.

Adjusted odds ratios from multivariate models investigating the strength of associations between psychiatric disorders and gambling problem-severity groups are presented for black and white respondents, using same-race NG as the reference group (Table 3). The odds of any Axis I or any Axis II disorder was elevated in association with LRG and PPG in both black and white respondents, and interactions analyses yielded similar relationships across race groups. Among the diagnostic groupings within each Axis (mood, anxiety, and substance use disorders for Axis I and clusters A, B, and C for Axis II), both black and white respondents demonstrated elevated odds in association with more severe levels of gambling. Interaction analyses indicated that these relationships were largely of a similar magnitude in black and white respondents with the exception that the relationship between LRG and any mood disorder (OR = 1.38, $p = .01$), hypomania (OR = 1.77, $p = .04$), and any substance use disorder (OR = 1.2, $p = .02$) was stronger in blacks than in whites. The relationship between LRG and social phobia approached statistical significance at $p < .05$, with a relatively stronger relationship observed in black participants than in white ones (OR = 1.62, $p = .05$). Conversely, the relationship between PPG and nicotine dependence approached statistical significance at $p < .05$, with a relatively stronger relationship

TABLE 3. Associations between psychiatric diagnoses and gambling severity among black and white respondents

Psychiatric diagnoses	Black respondents		White respondents		Interaction (black vs. white)	
	OR for LRG vs. NG	OR for PPG vs. NG	OR for LRG vs. NG	OR for PPG vs. NG	OR for LRG vs. NG	OR for PPG vs. NG
Any Axis I disorder	2.17***	8.89***	2.08***	6.89***	1.11(.17)	1.27(.58)
Any mood disorder	1.69***	5.86***	1.15*	2.59***	1.38(.01)*	2.09(.07)
Major depression	1.47*	3.55**	1.01	1.90*	1.33(.07)	1.67(.31)
Dysthymia	1.22	6.82***	1.14	2.43	.99(.97)	2.53(.22)
Mania	2.49***	12.86***	1.47**	4.12**	1.67(.06)	3.06(.07)
Hypomania	2.85***	.41	1.62**	2.02	1.77(.04)*	.20(.2)
Any anxiety disorder	1.62***	4.26***	1.29***	3.26***	1.13(.24)	1.16(.71)
Panic disorder w/or w/o agoraphobia	1.93**	1.68	1.19	3.82**	1.46(.14)	.39(.39)
Social phobia	2.03**	3.92	1.16	2.46**	1.62(.05)	1.46(.65)
Simple phobia	1.52***	3.60***	1.38***	3.34***	.99(.93)	.97(.95)
Generalized anxiety disorder	1.30	5.61**	1.21	4.00**	.97(.92)	1.23(.75)
Any substance use disorder	2.57***	4.17***	2.33***	6.74***	1.20(.02)*	.65(.31)
Alcohol abuse/ dependence	2.47***	4.27***	2.15***	6.21***	1.27(.12)	.78(.54)
Drug abuse/ dependence	2.96***	3.38*	2.23***	2.90*	1.44(.14)	1.35(.65)
Nicotine dependence	1.98***	3.13***	1.94***	7.14***	1.05(.68)	.45(.05)
Any Axis II disorder	1.66***	7.19***	1.54***	6.13***	1.09(.36)	1.19(.65)
Any Cluster A	1.59***	5.42***	1.41***	5.22***	1.11(.38)	.99(.98)
Paranoid	1.85***	7.36***	1.38***	6.90***	1.30(.07)	1.03(.95)
Schizoid	1.36*	5.92***	1.48***	5.88***	.92(.63)	1.01(.98)
Any Cluster B	2.27***	8.45***	1.90***	6.58***	1.30(.12)	1.38(.4)
Histrionic	1.90*	4.22***	1.40**	8.06***	1.36(.21)	.53(.19)
Antisocial	2.24***	8.54***	2.13***	6.91***	1.20(.34)	1.39(.48)
Any Cluster C	1.52***	5.71***	1.37***	3.59***	1.09(.49)	1.57(.23)
Avoidant	1.55	4.41**	.93	2.84**	1.58(.09)	1.44(1.54)
Dependent	1.27	8.85***	1.02	3.33	1.19(.77)	2.51(.26)
Obsessive–compulsive	1.45**	6.02***	1.44***	4.03***	1.01(.94)	1.49(.29)

Notes: NG = no gambling or low-frequency gambling group; LRG = low-risk or at-risk gambling group; PPG = problem or pathological gambling group.

Adjusted for age, gender, marital status, income, education, and employment. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

observed in white respondents than in black ones (OR = .45, $p = .05$).

DISCUSSION

This study is the first, to our knowledge, to systematically investigate differences between black and white adults in the associations between Axis I and Axis II psychiatric disorders and different levels of gambling problem severity in a nationally representative sample. The findings generally support our a priori hypotheses that (a) black respondents in comparison to white respondents would exhibit higher rates of PPG and (b) rates of psychiatric disorders would be associated with past-year gambling problem severity in both black and white respondents. Although patterns of co-occurrence appear largely similar across racial groups, the relationship between past-year gambling severity and several forms of psychopathology appears stronger in black respondents as compared to white ones, specifically in the relationship between subsyndromal gambling and mood disorders (particularly hypomania) and substance use disorders.

Gambling Problem Severity

Our finding that black respondents exhibited higher rates of PPG than their white counterparts is consistent with prior research findings documenting increased

frequencies of PPG in blacks in comparison to whites.[3,4] Furthermore, consistent with previous findings that racial minority women may be at particularly high risk of PPG,[2,8] we found that higher proportions of black problem or pathological gamblers, as compared with white ones, were women (49% vs. 32%). These findings support the importance of attending to gender differences nested within cultural/racial groups to attenuate the risk of stereotyping and enhance treatment efficacy.[22,23] Future research might benefit from examining possible gender and racial differences in motivations to gamble and the extent to which different strategies may be needed to optimize treatment for men and women from different racial groups.

Gambling and Axis I Psychiatric Disorders

Our findings using a nationally representative sample largely corroborate those previously reported on the high rates of co-occurrence between PPG and Axis I psychiatric disorders among patients in treatment or seeking help.[8,10,24] We found elevated rates of mood, anxiety, and substance use disorders among both black and white PPG respondents. Study findings also extend those previously reported regarding the high rates of anxiety, depression, and substance-related disorders (including those related to alcohol, illicit drugs, and nicotine) among black and white callers to a gambling helpline[8] by specifying the types of mood (major depression, dysthymia, mania) and anxiety disorders (panic disorder with and without agoraphobia, social phobia, simple phobia, generalized anxiety disorder) that were associated with PPG and by documenting the increasing prevalence of Axis I psychiatric disorders accompanying levels of gambling problem severity.

Our findings confirm and expand upon prior epidemiological studies, showing a robust association between PPG and a range of psychiatric disorders.[3,4] In contrast to the Cunningham-Williams et al. study, which used DSM-III diagnostic criteria and a sample recruited from St. Louis, MO, this study employed DSM-IV diagnostic criteria and a nationally representative sample. Whereas the Petry et al. study used lifetime measures of Axis I psychopathology, we incorporated past-year measures, which are less prone to imprecision resulting from recall bias, afford a better test of psychiatric comorbidity because symptoms of the disorders being considered will have been present within 12 months of each other, and are arguably more relevant to clinicians and public health officials.[9,11] These studies also extend prior NESARC studies (ones examining differences in the relationship between gambling severity and other psychopathology as related to gender,[9] nicotine dependence,[17] or alcoholism[25]) by focusing on racial differences in psychopathology associated with gambling problem severity. Similar to the St. Louis Epidemiologic Catchment Area (ECA) study,[3] we found that the prevalence of Axis I psychiatric disorders increased with higher problem gambling severity, lending support to the conceptualization that gambling problems occur along a continuum[20,26] and suggesting that clinicians might benefit from assessing and addressing the psychiatric correlates of subsyndromal gambling and not only those pertaining to PPG.

While a largely similar pattern in the associations between gambling problem severity and Axis I disorders was observed in black and white study groups, a stronger relationship between subsyndromal gambling and "any mood disorder" (and particularly hypomania) and "any substance use disorder" emerged in black respondents as compared to white ones. These findings expand upon prior research concerning the potential public health impact associated with subsyndromal levels of gambling[27] by specifying groups of Axis I disorders that appear to be particularly associated with LRG among blacks. Irrespective of the underlying mechanism for this association (eg, genetic, environmental), these findings indicate that subsyndromal gambling in black individuals may be associated with greater psychopathology than such gambling in whites. They also highlight the need for further research into the relationship between gambling and race and suggest that public health initiatives concerning recreational gambling should incorporate race-related considerations.

Gambling and Axis II Psychiatric Disorders

Prior to the NESARC, community studies have generally not included measures of both gambling problem severity and PDs. Results from this study confirm and expand upon prior studies demonstrating an association between PDs and PPG.[9,17] Despite some PDs showing larger odds ratio magnitudes in association with PPG in black as compared to white respondents (most notably dependent PD) and vice versa (most notably histrionic PD), none of the interaction terms were statistically significant. The absence of significant interaction terms may be a function of the small sample of PPG respondents in our study; perhaps with a larger sample of PPG individuals, the odds ratios observed in this study may have become statistically significant. Overall, study findings suggest that clinicians should be alert to the possible presence of a PD among both black and white patients with subsyndromal levels of gambling and not just among those presenting with PPG, especially since the presence of a PD may complicate the treatment of PPG.[28]

Limitations and Strengths

Several potential limitations are worth noting. The survey was cross-sectional and thus limits statements regarding causation among study variables. The low rates of past-year pathological and at-risk gambling necessitated the combining of past-year problem and pathological gambling, and past-year low-risk and at-risk gambling were also combined to facilitate comparisons, particularly among black respondents. Future research studies might benefit

from separating nongamblers from low-frequency gamblers, low-risk gamblers from at-risk gamblers, and problem gamblers from pathological gamblers, and analyzing possible differences on psychiatric outcome variables among these gambling subgroups. Currently, there is an absence of established standards for categorizing gambling problems along a continuum. Consistent with previous studies,[9,17,25] we operationally defined past-year nongamblers and low-frequency gamblers as those who had not gambled more than five times per year in their lifetime, and we set the threshold for PPG at three or more inclusionary criteria; however, these categorizations are not based on empirically derived thresholds.[9,25]

Low rates of endorsement of some psychiatric disorders, such as dependent PDs, limit our ability to conduct meaningful comparisons. Additionally, due to concerns about response burden, the NESARC did not exhaustively assess Axis I and Axis II disorders; consequently, certain diagnoses, which may be clinically relevant to gambling problem severity, were not assessed, including nongambling impulse control disorders, attention-deficit/hyperactivity disorder, post-traumatic stress disorder and borderline PD. Future research examining the psychiatric correlates of problem gambling severity might benefit from the inclusion of measures that assess these diagnoses.

Despite these limitations, the current study represents an initial investigation of race-related differences in the psychiatric comorbidity of problem gambling severity among blacks and whites. The present study is the first, to our knowledge, to systematically investigate race-related differences in psychiatric disorders accompanying varying levels of past-year gambling problem severity among a nationally representative sample of black and white respondents. The strong associations across race groups between mood, anxiety, substance use, and PDs, and gambling problem severity, offer support for the routine assessment of these psychiatric disorders in patients presenting for gambling treatment, as well as screening for problem gambling severity among patients seeking treatment for other psychiatric disorders. Study findings also highlight the importance of developing treatments for problem or pathological gamblers with co-occurring psychiatric disorders: currently there is a dearth of evidence-based treatments for individuals with co-occurring gambling and other psychiatric disorders. Brief intervention strategies that may prove cost-effective, such as motivational interviewing, may be particularly important to investigate in individuals with subsyndromal gambling disorders. Our findings concerning race-related differences in the associations between problem gambling severity and psychiatric comorbidity among black and white respondents suggests the need for further race-related research examining (a) possible underlying mechanisms (eg, biological, genetic, environmental) that may explain these different comorbidity patterns, and (b) the extent to which different patterns of psychiatric comorbidity among blacks and whites may affect treatment seeking behaviors and outcomes. Such studies and related prevention efforts should carefully evaluate subsyndromal levels of gambling given race-related differences in their association with mood and substance use disorders.

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Declaration of Interest

All authors report that they have no conflicts of interest over the past 5 years to report as related to the subject of the report. Dr. Potenza consults for and is an advisor to Boehringer Ingelheim, receives research support from Mohegan Sun Casino, the National Center for Responsible Gaming and its affiliated Institute for Research on Gambling Disorders and Forest Pharmaceuticals, has received research support from Ortho-McNeil and GlaxoSmithKline, has consulted for and has financial interests in Somaxon, and has consulted for law offices and the federal defender's office as an expert in pathological gambling and impulse control disorders. The authors alone are responsible for the content and writing of this paper.

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