

WAGER 15(8) – And the List Goes On: More Similarities between Problem Gambling and Substance Use Disorders

Past research shows that problem gambling shares many neuropsychological similarities with substance use disorders: people with problem gambling show evidence of withdrawal and tolerance, and their brains demonstrate activity similar to that of people addicted to illicit substances (Breiter & Gasic, 2003; Shaffer et al., 2004; Wray & Dickerson, 1981). This week the WAGER reviews a study that examined similarities in decision-making deficits between people with problem gambling and people with alcohol dependence (Lawrence, Luty, Bogdan, Sahakian, & Clark, 2009).

Methods

- The investigators recruited:
 - Problem Gamblers (PGs): a community sample (n=21) of male problem gamblers (≥ 3 on the [South Oaks Gambling Screen \[SOGS\]](#));
 - Alcohol Dependent Individuals (ADs): male outpatients with alcohol dependence (n = 21);
 - Healthy Controls (HCs): a community sample (n=21) of healthy male controls (≤ 2 on the SOGS).
- Participants completed a battery of neuropsychological tests that assessed:
 - Decision-making and wagering in risky situations (the [Cambridge Gamble Task](#));
 - Tendency to act impulsively vs. gather extra information (the [Information Sampling Test](#)); and
 - Working memory (the [CANTAB Spatial Working Memory Test](#) and the [Digit Span](#) Test).

Results

- Table 1 displays the results for PGs, ADs, and HCs.
- PGs wagered more and were more likely to experience bankruptcies than controls on the CGT; they also made more errors than controls on the IST. PGs did not differ significantly from ADs on these assessment outcomes.
- PGs and ADs opened fewer boxes than controls in the IST, indicating greater impulsivity.
- ADs demonstrated working memory deficits compared to controls and PGs on both the SWM test and the DS test, and took longer than controls and PGs to make decisions in the CGT.

Table 1 - Neurocognitive Assessment Scores (adapted from Lawrence et al., 2009)

Test	PGs	ADs	HCs
Cambridge Gamble Task (CGT)			
Decision-making quality (% of trials correct color)	90[+19]	94[+9]	96[+9]
Decision-making latency (ms taken to select color)	2064[+739]	2742[+1136]	1970[+753]
Percent wagered (of available points in a given trial)	59[+17]	56[+11]	48[+13]
Bankruptcies (% who lost all points in a trial block)	24%	19%	0%
Information Sampling Test (IST)			
# of boxes opened (out of 25)	8.6[+3.6]	9.8[+4.1]	12.8[+4.6]
# of errors	5.0[+3.2]	4.8[+2.5]	3.2[+2.4]
Spatial Working Memory Test (SWM)			
# of errors	23.3[+22.8]	40.3[+30.0]	22.8[+21.4]
Digit Span Test (12 numbers) (DS)			
Forward score (# correctly remembered)	9.7[+1.8]	8.3[+1.9]	10.1[+1.8]
Backward score (# correctly remembered)	8.6[+3.0]	6.5[+2.2]	7.8[+2.5]

Note. PGs = Problem gamblers; ADs = Alcohol dependent individuals; HCs = Healthy controls. Cells highlighted in pink are statistically different from those highlighted in yellow ($p < .05$). Pink indicates a decision-making deficit.

Limitations

- The study examined only male participants.
- The study recruited ADs from a treatment program, but recruited PGs from the community, somewhat limiting comparability.
- The study cannot establish whether decision-making deficits preceded or resulted from addictive behavior.

Conclusion

PGs and ADs appear to share deficits in impulsive decision-making (i.e., deficits on the IST), and to some extent, risky decision-making (i.e., wagering behavior on the IGT). Only ADs experienced working memory deficits. Prior research suggests that the working memory deficits experienced only by the ADs in this study might be a neurological consequence of heavy alcohol use (e.g., Sullivan, Rosenbloom, & Pfefferbaum, 2000). The other deficits likely represent shared neurological vulnerabilities for both gambling and alcohol use problem. Future research will need to test this causal interpretation.

-Sarah Nelson

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WAGER Vol. 15(6) – More or Less the Same: Variations on Brief Gambling Treatment

Historically, effective treatment for gambling disorders has been an elusive goal, considering that only a very small proportion of gamblers ever seek treatment (Cunningham, 2005). Brief treatment, which typically involves treatment of ten sessions or less, has been effective with alcohol related problems. Therefore, an adaptation of the brief treatment model might be equally effective for disordered gamblers unwilling to seek formal treatment. This week's WAGER reviews a report by Hodgins, Currie, Currie, and Fick (2009) in their continuing research on brief treatment variations.

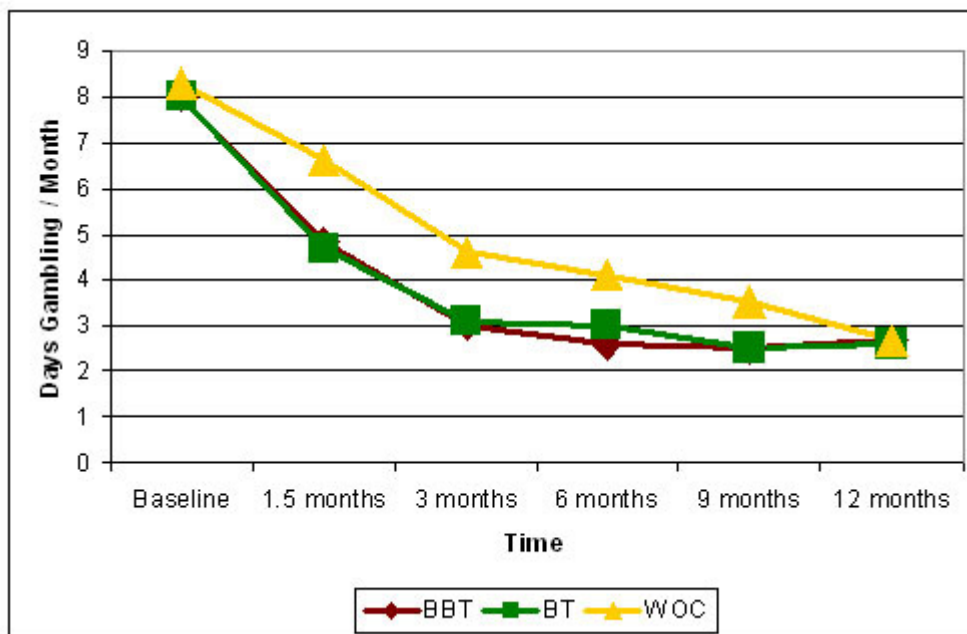
Methods

- Researchers used a randomized control study design and recruited 314 problem gamblers interested in reducing their gambling.
- At baseline, researchers gathered data about participants' demographics, gambling history, use of public resources for gambling treatment, and gambling severity.
- Researchers assigned participants to one of four conditions:
 - Brief Treatment (BT) participants received a self-help workbook after one half-hour telephone session of [motivational interviewing \(MI\)](#). The workbook provided self-assessments for gambling problems, practical recovery strategies, and information about local resources.
 - In addition to the initial MI and workbook, Brief Booster Treatment (BBT) participants received six more brief telephone MIs at 2, 6, 10, 16, 24, and 36 weeks.
 - Workbook Only Control (WOC) participants received the workbook without MI contact.
 - Waiting List Control (WLC) participants waited six weeks before receiving the workbook, and had no MI contact.
- For all four conditions, researchers conducted follow-up assessments at 6, 12, 24, 36, and 52 weeks after initial contact. During these assessments, researchers collected measures of gambling prior to follow-up interviews.

Results

- After 6 weeks, BT and BBT participants reported significantly lower rates of gambling days per month than WOC and WLC participants. ($M = 4.7$, $SD = 6.0$; $M = 4.8$, $SD = 5.9$; $M = 6.6$, $SD = 7.3$; $M = 5.7$, $SD = 6.4$, respectively.)
- As Figure 1 shows, participants across the BBT, BT, and WOC conditions reported significantly lower rates of gambling at all follow-up assessments
- At the 12-month follow-up, neither BT nor BBT gambling rates differed significantly from WOC. (BT vs. WOC, $\chi^2(1, N = 249) = 3.0$, $p = ns$; BBT vs. WOC, $\chi^2(1, N = 249) = 2.1$, $p = ns$).¹

Figure 1 - Gambling Rates at Follow-Up Assessments (adapted from Hodgins et al, 2009).



Limitations

- For ethical reasons, researchers could not retain participants on a waiting list for the duration of the study; therefore all participants received some form of treatment during the study year.
- Participants volunteered for the clinical trial, and were interested in reducing their gambling, so the results are not generalizable to all gamblers.

Discussion

Similar to Hodgins et al.'s original study (2001), the results of this experiment highlight the efficacy of brief treatments with or without motivational therapy. Though the follow-up findings from Hodgins original study found larger differences between MI and non-MI groups (Hodgins et al., 2004) than the current study, one consistent result across these three reports is a steady decline of problem gambling, without much distinction between the types of treatment. One possible explanation is that problem gamblers naturally regress from their addiction, regardless of treatment or treatment type. An important point to consider is that all participants in these studies received follow-up interviews to collect data; therefore, another possibility is that contact, whether motivational or not, was enough to affect gambling behavior.

A noticeable similarity between the three studies is the self-selected nature of the participants. Only gamblers who expressed interest to reduce or quit their problem behavior were recruited as participants. For future studies, the inclusion of moderator and mediator variables, such as participant expectations and readiness to change, would help clarify the mechanisms through which these interventions are effecting change.

-Aaron Lim

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Footnote: Measures for WLC follow-ups after six weeks were not reported.

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The WAGER, Vol. 15(5) – The 2007 British Gambling Prevalence Survey: Considering Gambling Involvement

Conventional wisdom suggests that specific gambling activities, such as Internet gambling, are especially “addictive.” However, recent research suggests that the relationship between gambling and disordered gambling is more complicated than playing specific types of games. Using a United States youth sample, research suggests that gambling involvement (e.g., the number of games one plays), is a better predictor of disordered gambling than participation in any particular game (Welte, Barnes, Tidwell, & Hoffman, 2009). This week the WAGER reviews a study that further explored this phenomena by examining the association between disordered gambling and gambling involvement within the 2007 British Gambling Prevalence Survey (LaPlante, Nelson, LaBrie, & Shaffer, 2009).

Methods

- LaPlante et al. (2009) conducted secondary data analyses of the British Gambling Prevalence Survey (BGPS)¹ using weighted data of 8968 observations characteristic of the general population.
 - The researchers operationally defined the following variables.
 - Disordered gambling (i.e., endorsing 3+ DSM-IV pathological gambling symptoms in the past year).
 - Gambling involvement (i.e., the number of types of gambling for which an individual reported being involved during the past year).
 - The authors conducted a series of logistic regressions using participation in each gambling type to predict past year disordered gambling.
 - Consistent with Welte et al.’s. analytic strategy (2009), these logistic regressions were conducted first without controlling for involvement and then added involvement as a control. Table 1 lists the corresponding odds ratios.

Table 1: Odd ratios for predicting disordered gambling from type of game with and without controlling for involvement (adapted from LaPlante et al. 2009)

	Odds ratios not controlled for involvement	Odds ratios controlled for involvement
Spread betting	21.84***	0.70
Virtual gaming machines	24.01***	4.26**
Internet	9.58***	1.53
Betting on dogs	9.39***	1.95
Casino table games	8.15***	0.79
Other sports betting	6.60***	0.77
Fruit/slot machines	5.75***	1.19
Other betting	7.24**	2.93
Football pools	4.56***	0.44
Bingo	4.92***	1.76
Private betting	3.36***	0.36*
Scratch cards	3.91***	1.09
Betting on horses	2.77***	0.46*
Other lottery	3.00***	0.85
National lottery	1.85	1.04

*P<0.05; **P<0.01; ***P<0.001

Results

- When not controlling for involvement, participation in nearly every gambling type was statistically significant and positively associated with disordered gambling.
- When controlling for involvement, gambling via virtual gaming machines (e.g., virtual roulette, virtual bingo, virtual keno) was the only gambling type that remained significantly and positively associated with disordered gambling.

Limitations

- This BGPS gathers self-reported data without corroboration; therefore, this study is subject to the problems commonly associated with self-report.
- The authors only used one measure of gambling involvement.

Discussion

LaPlante et al. (2009) examined associations between participation in a particular gambling type and disordered gambling. The results indicated that when the authors controlled for gambling involvement, the association between participation in a particular gambling type and disordered gambling weakened for all types, and for 13 of 14 types, this association was no longer meaningful. These findings are consistent with an emerging body of research that suggests gambling involvement is a better predictor of gambling problems than participation in a particular game (e.g., Welte et al., 2009). One limitation of this research is that the authors used only one measure of gambling involvement (i.e., the number of types of gambling for which an individual reported being involved during the past year). More research is necessary to examine other -- and multiple -- measures of involvement to more accurately refine the meaning of gambling involvement.

-Ryan Martin

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¹The National Centre for Social Research (2008) produced the 2007 British Gambling Prevalence Survey (BGPS). The BGPS is a publicly available dataset representing interviews from 9,003 residents, randomly selected from households in England, Scotland and Wales; the response rate was 52% (Wardle et al., 2007). The BGPS assessed various gambling-related and demographic measures, including the following: past year gambling participation for 15 gambling types (e.g., lottery, online gambling, etc.) and past year DSM-IV pathological gambling criteria (American Psychiatric Association, 1994).