

Rapid Onset of Pathological Gambling in Machine Gamblers: A Replication

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This paper presents data describing the latency of the onset of pathological gambling (PG) in a large sample ($N = 180$) of men and women seeking treatment at the Rhode Island Gambling Treatment Program (RIGTP). The current study replicates the findings of [Breen and Zimmerman \(2002\)](#), and confirms that involvement with computerized gambling devices, such as video slots and video poker, is associated with a significantly faster onset of PG in both men and women who focus on those devices, compared to the latency of PG onset in patients who focus on other, more “traditional” forms of gambling. In addition, data are presented that suggest a linear association between the latency of PG onset and the contextual continuity of different forms of gambling. Forms of gambling that are more rapid, continuous, and repetitive are associated with a significantly faster onset of PG.

Keywords: Machine gamblers; Pathological gambling; Rapid onset; Computerized gambling technology.

Introduction

The expansion of legal gambling opportunities is a volatile political, economic, and public-health issue. State governments, strapped for cash, are looking towards new or expanded gambling opportunities in order to increase revenues, and computerized gambling technology is at the core of most such initiatives. Computer technology has made gambling machines the economic growth engine of the gambling industry. Whereas not too long ago table games produced 60% of the average casino's revenues, compared to 40% for machines, recently 70% of revenues have come from machines. One study of the two hugely successful casinos in Connecticut found that a approximately 73% of casino gambling revenue came from gambling machines ([Christiansen Capital Advisors, 2000](#)). Two epidemiological studies, each with more than 10,000 respondents, estimated that 42 to 53% of net revenues from video gambling machines come from problem gamblers ([Australian National Productivity Commission, 1999](#); [Focal Research, 1998](#)).

It is a mistake to conceptualize gambling as a homogeneous activity ([Dickerson, 1993](#)). Different forms of gambling vary importantly in terms of stimuli and features that contribute to the experience of the players. Machines are the fastest, most continuous medium of gambling. Bets can be made and decided in a matter of seconds, with virtually no delay before the pattern is repeated. Machines are non-threatening and user-friendly to the uninitiated; thus, they may offer an unparalleled “gateway” activity to gambling for young, naïve, or inexperienced players.

Since gambling has become more available, there is greater awareness and interest in pathological gambling (PG) and its potential impact on public health. A central question of importance is whether computerized gambling machines are more addictive than other, more traditional forms of gambling, such as betting on sporting events, card and dice games, or horse races. If machines are, in fact, a more “virulent strain” of gambling, then they would be associated with a more rapid onset of PG. [Breen and Zimmerman \(2002\)](#) found support for this hypothesis using the Gambling History Questionnaire (GHQ; [Breen, 2000a](#)) and a semi-structured diagnostic interview to gather an in-depth history of gambling involvement and the onset of PG. In 44 adult pathological gamblers (PGs) seeking outpatient treatment, those who gambled primarily on ma-

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chines while their problems developed (“machine” PGs; $N = 25$) had a significantly shorter latency to onset than did “traditional” PGs (1.08 years vs. 3.58 years, respectively). Latency was defined as the period of time (in years) between beginning gambling on a regular basis and the onset of PG. Gender and psychiatric status (e.g., history of depressive disorders or substance-use disorders) were not significantly associated with the latency of onset.

These results are contrary to the findings of other researchers (Tavares, Martins, Lobo, Silveria, Gentil, & Hodgins, 2003; Tavares, Zilberman, Beites, & Gentil, 2001), who suggest that gender differences are central to a more rapid, or “telescoped” progression of PG. Breen and Zimmerman (2002) pointed out methodological differences that accounted for the conflicting findings. First, it is crucial to understand that most PGs focus on one, and only one, primary problem form (PPF) of gambling at any particular point in time (Beaudoin & Cox, 1999; Breen, 2000b; Breen & Zimmerman, 2002; Lesieur, 1984; Morgan, Kofoed, Buchkoski, & Carr, 1996). Second, the PPF may shift or switch from one form to another many years after the onset of PG (Breen & Zimmerman, 2002; Morgan et al., 1996).

Therefore, to better understand the relative contributions of environmental (PPF) and intrapersonal factors (e.g., gender, psychiatric status, age) to the speed of PG onset, the data must clarify the primary form of gambling *when PG onset occurred*. The data must also consider that regular patterns of betting on other forms of gambling may have persisted over many years (especially in males with a longer history of betting), either with or without ensuing problems. When this more rigorous developmental history of gambling participation was examined, the effects of gender and psychiatric status were nonexistent, while the PPF was significantly associated with a more rapid onset of PG (Breen & Zimmerman, 2002).

The current study is a replication of Breen and Zimmerman’s (2002) study. The latency of PG onset was predicted to be significantly shorter in PGs whose primary form of gambling at onset was machines, compared to those who developed PG while primarily involved with the more “traditional” forms of gambling. Traditional forms of gambling include cards, dice, horses, dogs, sports, bingo, and “instant” lottery games (scratch-offs and keno). We also examined the relative contributions of gender, predicting that gender would not be significantly associated with the latency of PG onset.

A corollary hypothesis was that there would be a significant linear association between the speed of PG onset and the continuity and repetitiveness of the major categories of gambling, such that gambling categories that are more rapid, continuous, and repetitive would be associated with a faster onset of PG.

Method

Setting

The present study was conducted at the Rhode Island Gambling Treatment Program (RIGTP) in Rhode Island Hospital’s Department of Psychiatry. The RIGTP is an outpatient program for psychosocial treatment of PG.

Participants

The participants were 180 consecutive PGs who completed an initial evaluation at the RIGTP from June 2001 to March 2003. The sample consisted of 95 males (52.8%) and 85 females (47.2%) with a mean age of 45.3 years (median = 45; range = 17 to 74). Most patients were Caucasian ($N = 165$; 92%); minorities ($N = 15$) included 4% African Americans, 2% Hispanics, and 2% Asians. This racial distribution closely approximated that of the general population of Rhode Island. The mean SOGS score (Lesieur & Blume, 1987) of the participants was 12.67 ($SD = 3.7$), which indicates a severe level of problems and is comparable to other treatment samples. The SOGS is a valid and reliable screening measure of PG.

Measures

One of the two clinical psychologists in the RIGTP conducted all diagnostic interviews. For the purpose of the current investigation, three sources of data were used.

First, each patient completed the Gambling History Questionnaire (GHQ; Breen, 2000a), which is a self-report that collects information about the significant events in the development of gambling problems, such as the age of the very first bet for money, the age of regular gambling involvement, and the age when gambling became a serious problem. The GHQ also gathers information about the different types of gambling on which an individual has concentrated during these different periods. The GHQ captures information about shifts in focus from one primary form of gambling to another, when these change points occurred, and how they affected gambling patterns. The GHQ also assesses amounts of money lost and time spent on gambling. The GHQ has demonstrated excellent reliability and validity (Breen & Zimmerman, 2002).

Second, we used a semi-structured diagnostic module to assess DSM-IV criteria for PG; this module was included in our diagnostic evaluation. The module also assesses age of PG onset. PG onset was defined as the age at which the full DSM-IV criteria were met. The interviewer clarified and confirmed the age of PG onset and the gambling history of each patient by following up GHQ responses with verbal inquiry. This cross-

checking procedure resolved inconsistencies in the data. Finally, because of rigorous data collection, we were able to compute the latency of PG onset with particular sensitivity to “switches” in the major form of gambling.

We computed latency based on the form of gambling that was predominant at the time of PG onset. Latency was defined as the period of time (in years) between non-pathological gambling and PG onset when the major form of gambling was the same at both time points. However, if the major form of gambling had “switched” to another form of gambling before PG onset, then latency was defined as the period of time between beginning the new form of gambling and PG onset (see Breen & Zimmerman, 2002, for a more detailed discussion).

In summary, there were three sources of data obtained for this study: (a) a self-reported history of gambling involvement and problems was reviewed and confirmed with an unstructured interview; (b) a semi-structured diagnostic module for PG further confirmed the diagnosis and age of PG onset; and (c) the latency of PG onset was computed based on the problem form of gambling at PG onset, rather than the current problem form.

Results

Participants lost an average of \$3123 in the preceding 30 days ($SD = \$4395$; median = \$1620; range = \$0 to \$30,000). Participants gambled an average of 11.5 days on their primary problem form ($SD = 8.5$; median = 10 days; range = 0 to 30 days). We distinguished between two types of financial loss—current debt and liquidated assets. The mean amount of outstanding debt directly due to gambling was \$37,230 ($SD = \$89,010$; median = \$15,000; range = \$0 to \$1,000,000). Independent of outstanding debt, participants reported that they had liquidated assets (stocks, bonds, IRAs, real estate, insurance policies, jewelry, etc.) to finance gambling. The mean amount of assets sold was \$41,150 ($SD = \$76,732$; median = \$13,700; range = \$0 to \$500,000). Combining outstanding debts due to gambling with the value of hard assets liquidated due to gambling resulted in a gross estimate of the average financial damage due to gambling of \$85,483 per subject (median = \$33,000; $SD = \$140,856$; range = \$2400 to \$1,050,000). Independent of current financial damage, 41 (22.8%) participants had declared bankruptcy in the past, erasing an average of \$53,103 worth of debt ($SD = \$55,312$; median = \$30,000; range = \$5,000 to \$250,000) that was directly related to gambling.

The mean age of PG onset in this sample was 38.05 years ($SD = 12.07$). Consistent with other research (e.g., Breen & Zimmerman, 2002; Mark & Lesieur, 1992), females reported a significantly older age of

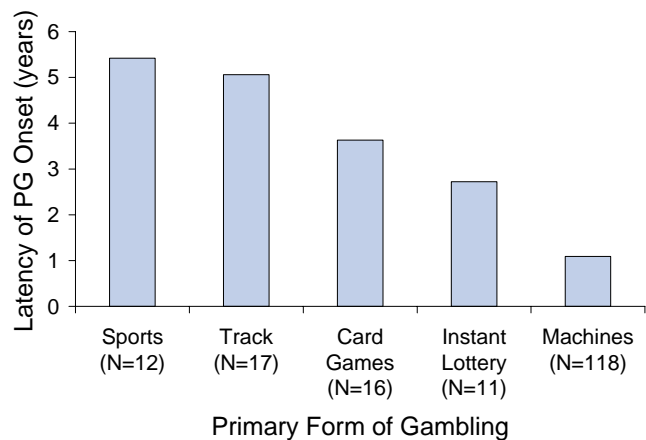


Figure 1. Latency of pathological gambling (PG) onset for different primary forms of gambling (in years).

onset than males (42.9 vs. 33.7 years; $t = 5.47$, $p < .005$) and a shorter duration of PG (5.1 vs. 9.1 years; $t = 3.3$, $p < .01$). Also consistent with Breen and Zimmerman (2002), females were more likely than males to identify machines as the primary problem form of gambling at PG onset (87% vs. 46%; $\chi^2(1) = 33.0$, $p < .001$). At PG onset, 62 participants (34%) were primarily involved with “traditional” forms of gambling, including cards, dice, horses, dogs, sports, bingo, or “instant” lottery games (scratch-offs and keno). None of the participants reported daily numbers or lotto-style games (e.g., Powerball) as their PPF. A total of 118 participants (66%) were primarily involved with “machines” at PG onset (computerized gambling devices, including slots and poker). Seventeen participants (6 females) reported “switches” in PPF after PG onset. In 12 of these cases (71%), the switch was from a traditional form of gambling to machines.

A stepwise multiple regression analysis was conducted to examine the relative contributions of the primary problem form of gambling and gender on the latency of PG onset. Only the primary form of gambling at PG onset was retained in the model, $F(1,178) = 25.41$ ($p < .001$), explaining 12.5% of the variance in latency. A t test for samples of unequal variances revealed that the mean latency of PG onset in the 62 participants who were traditional gamblers at the time of onset was significantly longer than that of the 118 participants who were machine gamblers (3.89 vs. 1.09 years; $t = 3.85$, $p < .001$).

Post hoc analyses compared the age of onset machine PGs with that of traditional PGs. Traditional PGs had a significantly younger age of onset than machine PGs (30.98 vs. 41.78 years; $t = 6.3$, $p < .001$). Traditional PGs also started gambling regularly at an earlier age (26.16 vs. 38.56 years; $t = 7.73$, $p < .001$). No significant between-group differences in the current

Table 1
Mean Latency to PG Onset for Traditional Primary Problem Forms (PPFs) and for Machines

		Other Forms at PG Onset (<i>N</i> = 62)	Machines at PG Onset (<i>N</i> = 118)	Analysis
Gender	Male	51	44	$\chi^2_{(1)} = 34.05^{***}$
	Female	11	76	
Race	Caucasian	55	112	$\chi^2_{(1)} = 1.67$
	Minority	7	7	
Mean SOGS Score		12.94 (4.2)	12.5 (3.5)	$t(174) = 0.73$
Age (years)		43.71 (10.86)	46.33 (11.32)	$t(179) = 1.49$
Money lost in last 30 days (USD)		\$4,319 (\$5,399)	\$2,506 (\$3,653)	$t(77.58) = 2.23^*$
Days gambled on primary problem form (PPF) in last 30 days		12.03 (8.67)	11.11 (8.30)	$t(171) = 0.68$
Current outstanding debt due to gambling (USD)		\$51,227 (\$137,706)	\$29,368 (\$44,635)	$t(65.54) = 1.20$
Assets liquidated due to gambling (USD)		\$65,912 (\$110,991)	\$28,617 (\$47,672)	$t(47.61) = 2.06^*$
Past bankruptcy amount due to gambling (USD)		\$66,791 (\$57,018)	\$41,284 (\$52,221)	$t(39) = 1.49$
Latency of PG onset (years)		3.89 (5.59)	1.09 (1.64)	$t(66.59) = 3.85^{***}$

Note. Numbers in parentheses, where displayed, represent standard deviations.

* $p < .05$

*** $p < .001$

amount of debt due to gambling or the number of days gambled on PPF in the prior month. The groups also did not differ in the severity of gambling problems, as measured by the SOGS. However, the traditional PGs in this sample had lost significantly more money in the previous 30 days than had machine PGs (\$4319 vs. \$2526; $t = 2.2$, $p < .05$).

As pointed out by Breen and Zimmerman (2002), obtaining a rigorous history of participation in different gambling activities is crucial to evaluate the development, onset, and progression of PG. To demonstrate the methodological importance of distinguishing the PPF at PG onset from the current form of gambling, we re-ran our analysis on latency using the current primary form of gambling (as in Tavares et al., 2001). When only the current form was accounted for, the results of the stepwise multiple regression suggested that gender was the only significant factor, $F(1,178) = 7.45$ ($p < .005$), as concluded by Tavares et al. (2001). Thus, the failure to account for the primary form of gambling at the time of PG onset leads to a considerably different conclusion.

On the basis of specific PPFs, traditional PGs were divided into four subgroups: card games (e.g., poker, blackjack); pari-mutuel (betting on horses or dogs); sports (betting on football, basketball, etc.); and “instant” lottery (e.g., “scratch-tickets” and keno in stores, bars, etc.). The latency of PG onset was then

examined individually for each of these subcategories. Figure 1 displays the mean latency to PG onset for the different subgroups of “traditional” PPFs, as well as for the machine group (see also Table 1). The analysis revealed a significant linear decrease in latency (i.e., faster PG onset) across categories, $F(4,169) = 8.99$ ($p < .001$). This linear decrease in latency is clearly associated with the speed and continuity of different PPFs. For example, betting on sporting events and races involves a slower pace of wagering, combined with a lengthier period of determination of outcomes. Card games are faster, instant lottery games are faster still, and machines are the fastest and most continuous means of betting.

Discussion

The results obtained in the present experiment have several limitations. Notably, the participant sample consisted of treatment-seeking problem gamblers, which may not be representative of PGs in general. Furthermore, the “true” latency to PG onset cannot be determined by examining only those individuals who developed the disorder. Under ideal conditions, the sample would consist of both gamblers who do and those who do not eventually meet DSM-IV criteria for PG. Such a method would require a large-scale, long-term, prospective longitudinal study using stratified

sampling techniques to select a representative sample. To our knowledge, such a study has yet to be attempted.

The impetus of the present, unfunded research was born from ten years of extensive clinical experience with PGs. Frequently, patients reported that they developed PG rapidly and severely after beginning involvement with machines. This was true despite that, in many cases, they had gambled regularly on other forms of gambling for many years without problems. Many of these patients had no prior history of major depressive, anxiety, or substance-use disorders.

A further limitation of the present data is that semi-structured diagnostic interviews for other psychiatric disorders were not conducted, as they were in [Breen and Zimmerman's \(2002\)](#) study. In their initial study, neither a lifetime history of a depressive disorder nor a substance-use disorder (including alcohol) affected latency to PG onset. In routine clinical practice it is too costly and time intensive to administer structured clinical interviews for DSM-IV psychiatric disorders. The evaluation at the Rhode Island Gambling Treatment Program, consisting of the clinical interview and the associated paperwork, lasted approximately three hours. Although other disorders at this clinic are diagnosed routinely, this is not done in a structured fashion. Ideally, as in the hypothetical study design outlined in the preceding paragraph, diagnoses of comorbid disorders would be obtained with standardized diagnostic interviews. Conceptually-speaking, current diagnoses would have little appeal as predictors of rapid onset of PG. Diagnoses with onset preceding, or concurrent with, the onset of PG would be more relevant.

The current study replicated the findings of [Breen and Zimmerman \(2002\)](#), who concluded that the primary problem form of gambling was significantly associated with a more rapid onset of PG in both men and women. Importantly, the larger sample in the current study allowed the evaluation of a corollary hypothesis: That the rapidity of PG onset was predictably and meaningfully associated with the contextual attributes of different PPFs, such as the rate, continuity, and repetitiveness of play. This hypothesis was upheld, therefore strongly supporting the theoretical framework of the research.

The underlying theoretical framework to this research can be summed up as follows: The salient qualities of the many different forms of gambling are so variable that, when comparing different forms of gambling, we may be comparing “apples and oranges.” For example, if one considers the problem of alcohol abuse, a glass of wine, a beer, or a mixed drink are equivalent, in that the active ingredient is identical in structure and dosage. This is factual regardless of whether one subscribes to a “disease” model, a “social learning” model, or some other conceptualization. The

same may not hold true for betting on a poker game, buying a scratch ticket, or playing a video slot machine. Not only may the “dosage” of the “active ingredients” differ, but those ingredients may be “structurally” different. At the very least, the “delivery mechanisms” differ in important ways.

There are important differences between machines and traditional forms of gambling. In terms of stimulus variables, machines provide a rapid, continuous, and repetitive means of betting. The lack of alternative responses, or cues for quitting, prolongs gambling when one is losing ([Breen, 2000c](#)). Machines also provide a continuous stream of visual and auditory stimuli that may promote responding ([Fisher & Griffiths, 1995](#)). Traditional forms of gambling generally offer less continuous action and, frequently, more social interaction.

However, the addictive qualities of video gambling transcend mere speed and continuity. The use of *virtual reel mapping* in the design of such devices creates an illusion of near misses and misrepresents the true odds of winning. A near miss is a losing result in which potential winning combinations are prominently displayed on or nearby the screen. Virtual reel mapping can be used to increase the occurrence of these presumably more stimulating and addictive results ([Kassinove & Schare, 2001](#); [Reid, 1986](#)). Player-protection software exists, but, to our knowledge, is rarely employed by the gambling industry in the United States. Such software is non-obtrusive and can be added to machines already in use; it can also be used at the option of patrons. Features that could be employed include a real-time clock, player-selected loss-limits, “credits” displayed as currency, and so on. The benefit of such initiatives, if effective, would be to curtail excessive losses by individuals who lose track of time, money, and the ability to make rational decisions while “under the influence” of video gambling machines. The most obvious “downside” would be to decrease industry or government profits, as these features target problem gamblers who tend to lose 17 times as much money on video gambling as the average non-problem gambling patron ([Australian National Productivity Commission, 1999](#)).

Our analyses suggest that the existence of a “telescoped” progression of PG in females could be spurious. All else being equal, males are just as susceptible to a rapid onset of PG if, as is increasingly the case, they are exposed to the technologically-advanced and engineered “addiction delivery devices,” known by euphemisms such as *video lottery terminals* (VLTs). Rather than rely on sexist notions, such as females’ supposed preference for passive escapism, to explain the rapid onset of PG, we suggest that there is a more parsimonious explanation that is gender-neutral. The government and the gambling industry have combined to legalize, promote, legitimize, and encourage the very types of gambling that hold the widest potential for

abuse. Clinical data gathered over the last 10 years (Breen, 2000b; Breen & Zimmerman, 2002) suggest that the widespread legitimization and promotion of computerized video gambling is having a deleterious effect on the development of problem gambling across genders. We predict that future data will show that race and age differences in the prevalence and development of pathological gambling may be attenuated as well.

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