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Abstract

Copyright 2014, Mary Ann Liebert, Inc. 2014. The Diagnostic and Statistical Manual of Mental Disorder, Fifth Edition (DSM-5), lists concealment as one of the symptoms of a gambling disorder. However, some transactions are more likely to leave permanent records of gambling transactions (credit, consumer loyalty schemes) than others (cash, Internet cash, Internet cafes, prepaid phones). An online survey of 815 participants recruited through newspaper and online sites elicited consumer preferences for a variety of transactions and communication media. Hierarchical multiple regression accounted for age, gender, housing status, and involvement in gambling before considering relationships between consumer preferences and scores on the Problem Gambling Severity Index. Even after statistically allowing for the contributions of other variables, a greater risk of developing a gambling problem was associated with a preference for cash transactions, prepaid mobile phones, and Internet cafes. Problem gamblers may seek to reduce their digital trace.

Keywords

digital, problems, traces, gambling, self, reported

Disciplines

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Self-Reported Gambling Problems and Digital Traces

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Abstract

The Diagnostic and Statistical Manual of Mental Disorder, Fifth Edition (DSM-5), lists concealment as one of the symptoms of a gambling disorder. However, some transactions are more likely to leave permanent records of gambling transactions (credit, consumer loyalty schemes) than others (cash, Internet cash, Internet cafes, prepaid phones). An online survey of 815 participants recruited through newspaper and online sites elicited consumer preferences for a variety of transactions and communication media. Hierarchical multiple regression accounted for age, gender, housing status, and involvement in gambling before considering relationships between consumer preferences and scores on the Problem Gambling Severity Index. Even after statistically allowing for the contributions of other variables, a greater risk of developing a gambling problem was associated with a preference for cash transactions, prepaid mobile phones, and Internet cafes. Problem gamblers may seek to reduce their digital trace.

Introduction

THE ADVENT OF THE INTERNET¹ and smart phones potentially place a gaming terminal within everyone's reach.²⁻⁶ However, such access comes with a concomitant facility for surveillance,⁷ with the electronic interactions leaving residual traces for possible scrutiny.⁸ As the Diagnostic and Statistical Manual of Mental Disorder, Fifth Edition (DSM-5), lists concealment as one of the symptoms of a gambling disorder, the present study considers whether problem gambling can be associated with a tendency to reduce one's digital trace, that is, an individual's attempt to minimize the risk of significant others detecting the full extent of their expenditure and/or pattern of use.

Consumer tracking

Providers of services track consumers to render better assistance.⁹⁻¹¹ Hence, electronic devices can now serve as the electronic equivalent of an aircraft's black box flight recorder, recording the nature of transactions, time, and location.

As a consequence, there is a potential change in the methodology employed to measure gambling behaviors.⁷ In contrast to previous studies relying on subjective rating scales and self-reported data, it is now possible to consider actual events recorded objectively by service providers.¹²⁻¹⁹

This also renders the potential for providers to monitor, and track and control behaviors in an online environment.^{15,20,21} Indeed, Auer and Griffiths¹² showed that behavioral tracking systems that allowed players to set voluntary limits could benefit the most gaming intense consumers.

There are, however, tradeoffs between privacy and customer service.⁹ Customer service systems require details of the consumer to render assistance properly, and there have been concerns that online gamblers may not take up and use player protection systems.²²

Unfortunately, personalized search engines do not perform as well if they lack details about the consumer.¹¹ This raises a possible issue for gamblers, given a proportion engage in a wider range of activities than others, and this includes the use of multiple service providers.²³⁻²⁶ As online gamblers have been encouraged to shift from provider to provider to benefit from inducements,²⁷ any one specific provider may not be able to monitor the full range of gambling activities, thereby compromising any tracking systems designed to render assistance to those experiencing difficulties or problems.

Concealment

Although lamented by reputable providers,⁹ a reluctance to engage with computer systems should not be too surprising given that consumer protection and privacy standards

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are not uniform in application across jurisdictions^{28,29} and that the “dark side” of the Internet is always outstripping its reputable regulated side.^{6,30,31}

The development of viral marketing³² and behavioral advertising³³ allows companies to target individuals with specific interests as a function of their browsing behavior. All too often, such “assistance” then manifests itself to consumers as spam,^{30,34} and inducements that pursue consumers,^{30,33} erode e-mail quotas, and waste Internet Service Provider resources.³¹

Unlike electronic interactions, where accurate recording should be considered the norm,³¹ deception can be a regular feature of normal behavior.^{35,36} Diary studies indicate that, on average, people lie between once and twice a day,^{35,37,38} although the majority of lies are told by a small section of the community.³⁹ Financial deception is reported by 30% of Americans, and these deceptions contribute to conflict within relationships.⁴⁰ Hence, the use of electronic systems has the potential to cause conflict, as a primary personal use of social media seems to be the surveillance of others.^{41,42}

Studies have considered the preferred media for deception.⁴³ Although electronic media afford the greater opportunity to manage self-presentation,^{44,45} electronic media also leave traces that significant others can monitor.^{46–48}

In their diary study, Hancock et al.³⁸ observed that on average about one in four social interactions involved a lie. However, the rate of “lies per interaction” was lower in e-mails. It seems documentation can influence deceptive behaviors.^{46,48} This potential for documentation, coupled with the lack of context provided by an immediate audience,⁴⁹ can create conflict between computer users and remote audiences. Indeed, there is evidence that social media can cause problems for interpersonal relationships.^{47,50,51}

Records of online transactions are thus likely to cause problems during financial deceptions⁴⁰ when seeking to disguise the transfer of funds.⁵² Membership of a consumer loyalty scheme, or the use of a credit card is likely to leave an electronic trace of transactions.^{8,53} Conversely, other systems such as Internet cash⁸ (PayPal, BPay, BitCoin) or prepaid mobile phones tend to anonymize transactions.⁵⁴

The purchase of prepaid mobile phones may not elicit adequate identifiers.⁵⁴ Whereas postpaid phones supply activity statements providing details as to the time and duration of phone calls, and indicate the numbers called, prepaid phones do not supply such documentation (see Table 1). Hence prepaid phones provide less documentation about a gambler's activities that could be accessed by significant others.

Although computers can sometimes be located from their IP address (e.g. www.iplocation.net/), the use of an Internet cafe renders the IP address effectively useless. Transactions conducted at an Internet cafe do not provide the unique IP address that will identify a person's place of residence or work location. In addition, Internet cafes typically operate on a cash basis. The operator may have details of use on the history of the device, but this information can be purged, and may not link the transaction to a specific user. Such factors may figure in the selection of the media that gamblers use for their transactions.

Digital franchise and gambling involvement

Although this article considers whether problem gamblers are prone to conceal and reduce their electronic trace, alternative explanations also need to be countenanced. For instance, some sections of the community (older, female) may be less digitally competent, or make less use of technology.⁵⁵

Problem gambling is associated with a greater involvement in gambling that is manifested as engagement in multiple forms of gambling.^{23,25,26} This increased range of gambling activities may involve a greater range of forms of transactions, and this may contribute to the forms of electronic media used by gamblers.

In addition, even though it is conceivable that a problem gambler would be less willing to leave an electronic trace, an alternative could be that gamblers are less likely to have a fixed address.⁵⁶ For instance, a person that gambles may be less likely to own his or her own home and thus lack the necessary electronic infrastructure at their place of residence. In such circumstances, Internet cafes can help to bridge the digital divide, providing access to the Internet. Hence, some individuals may be more difficult to track than others.^{57,58}

For such reasons, any analyses should seek to address the potential contributions of digital franchise and acknowledge a role of accommodation status or the degree of involvement in gambling before considering whether any preferences that might reduce a digital trace would also be associated with a greater risk of developing a gambling problem.

Method

Participants

There were 815 respondents that completed the online survey (357 male), ranging in age from 17 to 75 years of age ($M = 37.8$, $SD = 12.6$).

TABLE 1. INFORMATION POTENTIALLY AVAILABLE TO SIGNIFICANT OTHERS

	<i>Identification</i>	<i>Transaction</i>	<i>Time</i>	<i>Location</i>
Cash	—	—	—	—
Credit	Available on statements	Specified on statements	Specified on statements	?
Consumer loyalty	Available on statements	Activity levels may be supplied	Activity levels may be supplied	?
Prepaid phone	Supplied at point of sale in Australia	—	—	—
Internet cash (PayPal, Bpay)	—	—	—	—
Internet cafe	—	—	—	IP address does not identify user

Materials

The survey questions elicited demographic details (age, gender). Participants were asked whether they lived with parents, were renting, paying a mortgage, or owned their house. As an index of degree of involvement in gambling,^{23,25} a series of questions asked whether participants engaged in sports betting, wagered on races, purchased lottery tickets (online), used the Internet to bet on sports and races, and played online poker. Participants were asked to express their preferences on 6-point Likert scales as to a range of financial transactions: cash, credit cards, and Internet cash (PayPal, Bpay). Participants were asked their preferences for consumer loyalty schemes, Internet cafes, and prepaid mobile phones (1 = "I agree very much" to 6 = "I disagree very much"). Participants also completed the Problem Gambling Severity Index (PGSI),⁵⁹ a 9-point self-report scale used to assess problem gambling status, with a Cronbach's alpha of 0.84, and a test-retest reliability of 0.78.⁶⁰

Procedure

The online survey was advertised in print media and electronic noticeboards (available for 4 months). Participants answered the online survey to be entered in a draw to win 1 of 10 iPods.

Data analysis

Participants who did not indicate their accommodation status or indicated "other" were excluded from analyses. To measure involvement, the number of modes of bet placement subscribed to was summed. As these data were skewed, for analysis purposes, these values were transformed ($\text{Log}(N + 1)$). For purposes of interpretability, responses to questions on cash, prepaid mobile phones, Internet cafes, and Internet cash were reverse scored in the final analyses. As preferences for Internet cafes was skewed, these values were also transformed (SQRT). Hierarchical multiple regression was then conducted to determine whether a tendency to reduce digital traces could confer any additional explanatory power over that provided by a consideration of age, gender, accommodation status, or the number of forms of gambling engaged.

Results

According to the PGSI, 593 participants (72.8%) were classified as nonproblem or nongamblers, 120 participants

(14.7%) low risk, 76 (9.3%) moderate risk, and 26 (3.2%) problem gamblers. To explain risk of developing a gambling problem, age and gender were entered into the regression equation first, and approached significance, $F(2, 808) = 2.749$, $p = 0.065$. Problem gamblers tended to be young males.

Accommodation status and gambling involvement were entered into the regression equation next, and accounted for a significant proportion (11.4%) of the variance, $F(2, 806) = 52.302$, $p < 0.001$. Problem gamblers engaged in a larger number of forms of gambling (see Table 2).

After removing other sources of variance, a significant proportion of additional variance in problem gambling status (4.4%) could be accounted for, $F(6, 800) = 7.053$, $p < 0.001$. With increasing risk of developing a gambling problem, there was a greater preference for cash, $t(800) = 3.872$, $p < 0.001$ (see Table 3). Whereas 49.1% of nongamblers indicated that they preferred cash, this proportion increased as risk of a gambling problem increased, with 65.0% of low risk, 63.2% of moderate risk, and 69.2% of problem gamblers preferring cash (see Table 3). A preference for prepaid mobile phones also increased with risk of a gambling problem, increasing from 41.7% of nongamblers, 44.2% of low risk, and 56.6% of moderate risk, and rising to 73.1% of problem gamblers, $t(800) = 2.606$, $p = 0.009$. In addition, a preference for Internet cafes also increased with risk of developing a gambling problem, $t(800) = 2.711$, $p = 0.007$, with 12.3% of nongamblers preferring an Internet cafe, but this preference increased to 20.0% for low risk, 22.4% for moderate risk, and 38.5% for problem gamblers.

Discussion

As the risk of developing a gambling problem increases, there is a greater involvement in a range of forms of gambling. However, even after making allowances for age, gender, accommodation status, and involvement in gambling, there are some tendencies that reduce a digital trace that can be associated with a greater risk of gambling problems. Problem gamblers preferred cash transactions, were twice as likely to prefer prepaid mobile phones, and were three times as likely to prefer Internet cafes.

In the present data, the reported preference for cash increased with greater risk of developing a gambling problem. Cash transactions need not be recorded unless they exceed certain specified values, and some individuals engage in multiple transactions to disguise the overall size of

TABLE 2. HOME OWNERSHIP, GAMBLING INVOLVEMENT, AND PERCENT PREFERENCES VARY WITH RISK OF DEVELOPING A GAMBLING PROBLEM

	Non problem	Low risk	Moderate risk	Problem gambler
Home owned or mortgaged	62.1%	53.3%	50.0%	38.5%
Gambling involvement ^a	0.42 (0.08)	1.67 (0.53)	2.84 (0.54)	4.21 (1.39)
Not prefer credit	37.3%	39.2%	43.4%	50.0%
Not prefer consumer loyalty schemes	31.4%	30.8%	32.9%	26.9%
Prefers cash	49.1%	65.0%	63.2%	69.2%
Prefers Internet cash (Paypal, BPay)	65.9%	72.5%	68.4%	73.1%
Prefers Internet cafe	12.3%	20.0%	22.4%	38.5%
Prefers prepaid phones	41.7%	44.2%	56.6%	73.1%

Significant relationships shown in bold.

^aMean number of forms engaged in (standard errors in parentheses).

TABLE 3. PREDICTORS OF PROBLEM GAMBLING STATUS

Predictor	B	SE	β	t	p
Age	-0.003	0.002	-0.043	-1.216	0.224
Gender	-0.115	0.056	-0.072	-2.063	0.039
Home owner status	-0.058	0.038	-0.071	-1.542	0.123
Gambling involvement ¹	0.404	0.040	0.336	10.091	<0.001
Not prefer credit	0.005	0.019	0.010	0.247	0.805
Not prefer consumer loyalty schemes	-0.025	0.017	-0.052	-1.493	0.136
Prefers cash	0.078	0.020	0.149	3.872	<0.001
Prefers Internet cash (Paypal, BPay)	0.026	0.017	0.052	1.522	0.128
Prefers Internet café ²	0.477	0.176	0.090	2.711	0.007
Prefers prepaid phones	0.033	0.013	0.087	2.606	0.009

¹Log transformed.

²Square root transformed.

transactions.⁵² Although credit cards can be used directly or indirectly to support gambling activities,⁸ cash transactions leave less evidence for significant others to find.^{40,47}

We were surprised that consumer loyalty schemes did not feature as a predictor of problem gambling status. Most consumers (68.7%) were in favor of consumer loyalty schemes, but there were some suggestions of bimodality for those participants at lower risk of developing a gambling problem. As our question was generic, and our analysis sought to detect linear relationships, this possibly influenced our tests of significance. Problem gamblers were somewhat more interested in consumer loyalty schemes, but there was a nonsignificant ($p=0.137$) quadratic trend to the data, such that non and moderate risk gamblers were less interested in consumer loyalty schemes.

Inducements and complimentaries are an important marketing tool in some jurisdictions,⁶¹ and online gamblers have been advised to avail themselves of these inducements.²⁷ Indeed, online marketing can actually pursue consumers as a function of their interests and browser history,³³ but it is less clear who can access this information.⁶²

Although it was suggested that problem gamblers would avoid consumer loyalty schemes in an effort to reduce their digital trace, instead there were some indications that they were interested in such schemes. However, as the use of such “bonuses” can require appreciable deposits on the part of the gambler, and also feature in a number of online scams,³⁰ this has perhaps somewhat discouraged their attractiveness. It seems that these inducements play a role in marketing,⁶³ but there was little indication in the present data to suggest that consumer loyalty schemes were contributing to the development of gambling problems, but this should remain a topic for future consideration.

The status of Internet cash has been under review, with some systems such as PayPal initially being anonymous, and gradually being regulated and monitored,⁸ or being replaced by other encrypted forms such as BitCoin. Other systems such as BPay are legitimate in Australia, and their use would appear on bank or credit card statements. It is likely that the lack of significant findings arose because this question was either not sufficiently specific, or was asked in the context of a shifting regulatory environment.

Compared with online/Internet gambling, less research has been conducted on the topic of phone use.⁴ As Griffiths et al.⁴ note, most writings have been speculative in nature,

with studies assessing online/Internet use without mining down to the level of type of device used. An estimated 38.5% of the Australian consumers prefer a prepaid phone,⁶⁴ with one argument for this preference being the ability to control expenditure.⁶⁵ In the gambling literature, a method of limiting spending has been called “precommitment.”⁶⁶ Players are recommended to set a spending limit before commencing gambling. Precommitment has attracted controversy. Although it has been felt to be suitable for lower risk gamblers, there are concerns that higher risk gamblers will circumvent such spending controls. It is feared that problem gamblers will set limits unreasonably high, or swap and play on multiple accounts.⁶⁶ Hence, as problem gambling has been considered to be a disorder of impulse control, it is then perhaps surprising that problem gamblers would actually prefer prepaid phones. It would appear that they either prefer to allocate their money to gambling rather than phone contracts,⁶⁷ or that they are seeking to reduce their digital trace.

Given that problem gamblers have a preference for prepaid mobile phones as well as a preference for Internet cafes, we are suggesting that the data better represent attempts to reduce a digital trace (see Table 1). As risk of developing a gambling problem increased, there was a preference for media (cash, prepaid mobile phones, Internet cafes) that left less of a digital trace to be accessed by significant others.^{40,47} As a written statement provides documentation as to a gambler’s activity, the permanent records afforded by credit cards and consumer loyalty schemes³⁸ perhaps explain why problem gamblers do not prefer them.

It is not clear whether problem gamblers move from provider to provider to avail themselves of inducements, or whether the range,²⁶ breadth, or depth of gambling opportunities²⁴ is more symptomatic. However, a consequence of this greater flexibility is potentially an underestimate of the actual activity of a problem gambler. This may not be a problem, because antiproblem gambling systems are liable to set their thresholds based upon the activity they actually track, but it may mean that tracking could be underestimating the degree of problem tracked by a specific provider.

Although there is now the potential to track people’s actions online, there is also a growing realization that some behaviors may not be understandable to tracking,^{68,69} with some relationships between contingencies and behaviors (or between payoffs, risks, and the decisions agents make) not being transparent. In this regard, there are indications that the behaviors of

problem gamblers could be less transparent, and that there is a need for converging approaches to cross-validate tracking techniques with self-reported gambling problems.^{15,24,69}

The initial anonymity conferred by computer mediated communications has been linked to disinhibited⁴⁹ and less prosocial behaviors.^{70–72} However, reputation technologies such as offered by reverse e-mail directories can now collate the information from a multiplicity of online sources such as e-mail accounts, social media account, and real estate databases. Given a suitably unique identifier, it is possible to aggregate details on a specific individual. The development of such systems is moving to reduce the anonymity that was previously afforded by the Internet. Government regulations are also serving to reduce an anonymous use of telecommunication devices in specific jurisdictions. However, diary studies of lying indicate that deception is a relatively common and perhaps desired feature of human behavior.^{35,38} Hence, it is likely that even in a completely regulated and monitored domain, there will be an interest in transactions that are “off the record.”^{30,36} It remains to be seen whether offshore providers and encrypted funds transactions (e.g., BitCoin) will enable gambling transactions to continue unmonitored.

Limitations

Online surveys can be more representative of the community,⁷³ but could select the digitally competent. Although these anonymous respondents supplied preferences, they were never asked whether they lied.³⁹ As we did not check for comorbid conditions, it is possible the observed effects could reflect the contribution of alcohol, drug, or mood disorders.⁷⁴

Conclusions

The DSM-5 lists concealment as a symptom of problem gambling, and this symptom appears to extend into the digital domain. With a greater risk of developing a gambling problem, there is a preference for transactions and communication media that reduce a digital trace. Although the advent of regulated online casinos and consumer protection systems has the potential to curb problem gambling on a specific Web site, the tendency to engage in more forms of gambling and engage in concealment indicates that preventing problem gambling will be a more difficult proposition.

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