Gambling is in My Genes: Correlations between Personality Traits with Biological Basis and Digital Entertainment Choice

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ABSTRACT

Online gambling is one of the fastest growing areas in the digital entertainment industry. Gambling provides players with an intensely exciting experience and scholars see this as a primary cause of its attractiveness, and may play a role in the process of addiction. Finding a way to identify those more likely to gamble could be a first step towards discovering those who may be more likely to use certain genres of video games. This study used a sample of 93 college students to investigate whether personality traits believed to have their roots in biological differences can be used to predict one's preference for gambling online. Results showed that Zuckerman's Sensation Seeking Scale [27] and Lang's Motivation Activation Measure [16] both had significant correlation with pathological online gambling symptoms based on DSM-IV [1] modified for online gambling, while only the Motivation Activation Measure significantly correlated with individual's online gambling experience. Implications of the findings for both the industry and health professionals are discussed.

Author Keywords
Motivational Activation Measure, Sensation Seeking, Online Gambling

INTRODUCTION

Online gambling is gaining popularity. The estimated size of the U.S. online gaming market alone is around USD $12 billon, played by 8 million Americans in 2005 [23]. The public is concerned about the negative impact of online gambling [13], which is likely to be one of the driving forces putting pressure on U.S. legislators. In October 2006, the United States passed a bill that aimed to ban online gambling by disallowing its citizens to use credit cards to place bets online [24], but experts believe that the bill is not powerful enough to completely stop its citizens from going online to gamble [5].

Gambling has been a subject of interest to scholars for a long time. As Griffiths [10] puts it, "almost every major branch of psychology – cognitivism, behaviourism, Freudian theory, addiction theory – has been utilised in an attempt to understand gambling" (p.15).

Most of the scholarly work has been focused on problem gambling and pathological gambling. Problem gambling refers to gambling disrupting one's own life (which includes pathological gambling), while pathological gambling is a mental disorder that resembles substance use disorders [22]. However, little research has been done with regular gamblers and/or casual gambling.

Lang [14] has suggested that personality traits based on biological differences may lead to one's choice of media and content. Based on this argument, this study uses two different personality measures – Zuckerman's Sensation Seeking Scale (SS) [27] and Lang's Motivation Activation Measure (MAM) [16] – to explore whether individual's personality or motivational traits can be used to predict one's preference for highly arousing digital entertainment such as online gambling.

SENSATION SEEKING AND GAMBLING

According to Zuckerman [29], sensation seeking is a personality trait that involves the "seeking of varied, novel, complex and intense sensations and experiences" (p. 27). Extensive research to understand the psychobiological model underlying sensation seeking suggests that this personality trait is related to biological differences [28, 29, 30, 31].

A large body of research has repeatedly shown that sensation seeking is related to risky behaviors such as alcohol consumption, substance use, and unprotected sex [34]. Based on these findings on sensation seeking and risky behavior, Zuckerman suggested that pathological gamblers are prototypical high sensation seekers [32]. Interestingly, however, studies exploring the relationship between pathological gambling and sensation seeking have been inconclusive. A number of studies reported that pathological gamblers have about the same or even lower scores on SS compared to normal population [4, 20], which led some researchers to argue "pathological gamblers are

Situated Play, Proceedings of DiGRA 2007 Conference

neither impulsive nor sensation-seekers" (p.307) [1]. In response to the criticism, Zuckerman [33] argued that many of these studies used pathological gamblers in treatment, who are likely depressed, and depression is known to lower SS scores (see [11] and [33] for review).

Nevertheless, there are studies that that have looked for a relationship between sensation seeking and gambling behavior in normal populations. Based on a study of 790 adults, McDaniel and Zuckerman reported that there was a significant relationship between sensation seeking and regular gambling behavior [18].

In a recent large scale survey of 10,865 online gamblers from 96 countries respondents asked to list their reasons and motivations for gambling online, citied entertainment, excitement, or relieving boredom more than making money [9]. This finding is also in line with Zuckerman's prediction that the relationship between sensation seeking and gambling is about excitement, not profit. Thus, it is hypothesized that:

H1a. An individual's SS score will be positively correlated with his or her online gambling behavior.

H1b. An individual's SS score will be positively correlated with his or her likelihood of gambling online in the future.

The DSM-IV [2] form for pathological gambling is a survey that asks ten questions about one's gambling behavior. Typically those who answers "yes" to more than 5 items are seen as pathological gamblers [7]. This study has slightly modified this form to measure pathological online gambling by replacing questionnaire items about regular gambling with items about gambling online.

H1c. An individual's SS score will be positively correlated with his or her DSM-IV symptom score for pathological online gambling.

MOTIVATIONAL ACTIVATION AS AN INDIVIDUAL DIFFERENCE

Zuckerman has argued that SS is related to individual differences in motivational activation. In general, the motivational makeup of humans has been conceived of as two independent systems. One, an appetitive system which serves to maintain the organism and the other, the aversive system, which serves to protect the organism from danger (see [6] for review).

Based on this view of biological foundation for motivation, Lang et al. [15] has proposed that the individual differences in these appetitive system and aversive system could be measured. Lang and her colleagues developed the Motivational Activation Measure (MAM; [16]) as an index of individual differences in the operating characteristics of people's appetitive and aversive motivational systems. According to Lang et al. [15], individuals whose appetitive systems are more activated at rest or in a neutral environment have a higher positivity offset (PO) and tend to have a stronger tendency to approach novel objects than those who have a low PO. Lang and her colleagues suggested that personality traits, such as sensation seeking, "can be seen as the result of complex interactions between the basic mechanisms of the neurotransmitter systems" (p.2) [15] where the proposed PO is thought to be a indicator of this basic mechanism. Work done to validate MAM has shown that PO does correlate with SS score. Thus:

H2a. An individual's PO will be positively correlated with his or her online gambling behavior.

H2b. An individual's PO will be positively correlated with his or her likelihood of gambling online in the future.

H2c. An individual's PO will be positively correlated with his or her DSM-IV symptom score for pathological online gambling.

Another element in MAM is negativity bias (NB), which is the operating characteristic of the aversive system. Individuals high in NB are thought to have an aversive system which activates more quickly in response to negative stimuli than those with a low NB. In addition they are more likely to avoid potentially negative situations, and less likely to take actions that may have any negative consequences. However, gambling may not be perceived as something that will definitely have negative consequences. This leads to the following research question:

RQ. Is there any relationship between individual's NB and her online gambling behavior and DSM-IV symptom score for pathological online gambling?

METHODS

The sample consisted of students from a large Singaporean university. Students were recruited from a mass communications course and were rewarded with course credit. The computer software, MediaLab v2006 [12], was used to administer the computerized survey. Students came to the computer lab dedicated for this survey, signed up on a separate form for course credit, and completed the anonymous questionnaire. The questionnaire collected and assessed

1. Individual differences in motivational activation as measured by Mini-MAM 2.1 ([16]; see below);

2. Individual differences in sensation seeking trait as measured by Sensation Seeking Scale Form V [27];

3. Online gambling behavior, i.e., variety of online gambling engaged in, the amount of money spent gambling online, and time spent per visit to an online gambling

service. All questions asked about the respondents' experience over the last 12 months;

4. Self-assessed likelihood of gambling online in the future;

5. Pathological online gambling symptoms as measured by the modified DSM-IV [2].

Lang's MAM is a pictoral survey that shows a picture, and asks the participants to rate how positive, how negative and how arousing they feel (on a scale from 1 to 9) when viewing a set of images selected from the International Affective Picture System, a standardized database of pictures, which range from very calm to very arousing and from very positive to very negative. There are a few versions of MAM, such as Youth Oriented MAM and Mini-MAM. This study used Mini-MAM 2.1 to assess participant's PO and NB.

RESULTS

Sample

Due to technical issues, 7 participant's data was not usable. In addition, 10 participants who were not of Chinese descent were also excluded. This is because the Chinese community has been identified as one of the ethnical groups more open to gambling in general and to certain extent, more vulnerable to problem gambling and pathological gambling [3, 19, 25], and to eliminate cultural factors interacting with the independent variables under investigation. The final sample consisted of 93 students. The average age was 21.0 (SD = 1.65), and 68.8% were female.

SS and online gambling

Hypothesis 1a predicted that participant's SS score would positively correlate with their gambling behavior. As shown in table 1, there was no significant correlation between SS score and any of the online gambling behaviors. Hypothesis 1a was not supported.

Hypothesis 1b predicted that participant's SS score would positively correlate with their likelihood of gambling online in the future. As shown in table 1, there was a small significant correlation (r=.327, p<.01) and the likelihood of future online gambling. Hypothesis 1b was supported.

Hypothesis 1c predicted that participant's SS score would be positively correlated with their DSM-IV symptom score for pathological online gambling. Again, there was a small significant correlation (r=.22, p=.03) as shown in table 1. Hypothesis 1c was supported.

Table 1: Correlation between SS and other variables.

	Pearson Correlation	*p*-value
(H1a) Variety of online gambling	.134	.202
(H1a) Amount of money spent per month	.045	.666
(H1a) Time spent per visit to online gambling service	.161	.123
(H1b) Likelihood of future online gambling	.327	.001
(H1c) DSM-IV symptoms	.220	.034

PO and online gambling

Hypothesis 2 predicted that participants' MAM PO score would be positively correlated with their gambling behavior, likelihood of gambling online in the future, and the DSM-IV score.

As shown in table 2, there were significant positive correlations between PO and online gambling behaviors (r=.278, p<.01), money spent on online gambling (r=.21, p<.05), and time spent gambling online per visit (r=.31, p<.01) (H2a). Also significant were the positive correlations between PO and the likelihood of future online gambling (r=.20, p<.05) (H2b), as well as the DSM-IV score (r=.27, p<.01) (H2c). Thus hypotheses H2 is supported.

NB and online gambling

Research question asked whether there is any relationship between individual's NB and his/her online gambling behavior and/or DSM-IV score. There was no significant correlation between NB and any item.

DISCUSSION

Gambling is one of the activities that are seen as a very arousing leisure activity. Both SS score and PO have seen to have significant correlations with interest toward gambling online in the future and pathological online gambling symptoms as stated in DSM-IV. However, only PO was significantly correlated with current online gambling behaviors.

Table 2: Correlation between PO and other variables.

	Pearson Correlation	*p*-value
(H1a) Variety of online gambling	.278	.007
(H1a) Amount of money spent per month	.205	.049
(H1a) Time spent per visit to online gambling service	.311	.002
(H1b) Likelihood of future online gambling	.204	.049
(H1c) DSM-IV symptoms	.271	.008

Part of the reason may be because the sensation seeking measure includes multiple sub-concepts. The instrument, Sensation Seeking Form V, includes four factor-analytically determined subscales, which are: Thrill and adventure seeking (TAS), experience seeking (ES), disinhibition (Dis), and boredom susceptibility (BS). It is possible that one or more of the subscales may be less relevant or irrelevant to specific gambling behaviors indexed in this study.

For the gaming industry, the findings regarding the relationship between PO and online gambling may be generalized to many video games that are traditionally seen as arousing, such as first-person shooter games. Individuals high in PO are more likely to try out these products because they show stronger approach behavior to novelty in general. And for this reason, this population is likely to appreciate, or at least less likely to refuse playing, video games that are full of strong stimulations. Examples of such stimulations include fast animation, more stimulating sound effects, more dazzling visual effects, and continuous offering of novel objects/characters/events in the game.

Lang predicts that individuals high in PO are unlikely to be afraid of trying new media [14]. When this prediction is applied in the context of gaming, those who are high in PO are more likely to be early adopters of products using new technology, or even purchase new hardware for gaming.

College student gambling has been a problem in North America [21] and online gambling is now gaining popularity among this population quickly [26]. Findings of this study may be also helpful to health professionals in identifying the vulnerable population and focus their effort for prevention and treatment of problem online gambling and pathological online gambling. One way to apply the findings from this study is to carry out problem gambling prevention campaigns on new media, which individuals high in PO are expected to be not afraid of, or may even prefer, using. Since traditional media tends to be more expensive for advertising, targeting this population through the use of new media which is relatively less expensive, and increase the number of channels or number of repetition to increase awareness of the campaign can be more effective.

Future studies should explore the possibility of using other measures, such as modifying other tools widely used for assessing one's gambling behavior such as the South Oaks Gambling Screen [17] for online gambling to find the relationship between personality traits and online gambling behavior, as well as individual's choice for other leisure activities such as video games.

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