This is the published version:


Available from Deakin Research Online:

http://hdl.handle.net/10536/DRO/DU:30076071

Reproduced with the kind permission of the copyright owner.

Copyright : 2012, ANZMAC
Boomerang Effects of Gambling Warnings Exposed to Non-problem Gamblers

R. Mizerski*, University of Western Australia. dick.mizerski@uwa.edu.au
A. Lee, Deakin University. a.lee@deakin.edu.au
S. Sadeque, University of Western Australia. ssadeque@uwa.edu.au
W. Jolley, Norwich University. wjolley@norwich.edu
S. Wang, University of Western Australia. shashaatperth@gmail.com
J. Jiang, University of Western Australia. qinyuan@uwa.edu.au
C. Osborne, University of Western Australia. carol.osborne@bigpond.com

Keywords; gambling warnings, online gambling, unintended effects, non-problem gamblers.

Abstract
Gambling is the most popular form of entertainment in most markets where it is legal. The industry has embraced technology and is a growing category online and through mobile platforms. Governments throughout the world worry about the product when gambling is more widely available and more private to play. Warnings for problem gambling have long been used in land-based gambling venues but online gambling often does not have this remedy. In addition, non-problem gamblers make up about 99% of gamblers but little research has tested their reaction to warnings. An online casino was developed to test warnings and found that a significant proportion of non-problem gamblers gambled more frequently after exposure to the warnings. Because increased frequency of gambling is one symptom of problem gambling, the implications of these findings are discussed in terms of future remedies for consumers that have problems with gambling products.

Overview
Gambling is estimated to account for more revenue than all other forms of entertainment, and is the product category with the highest penetration and frequency of purchase for consumers (Jolley et al. 2006). Online gambling appears to be the new frontier for the gambling industry. At present, there is little regulation of access to online gambling websites. Lacking effective regulation, online gambling is assumed to pose a risk to vulnerable consumers.

EGMs most popular and most problems game
Online and offline, Electronic Gaming Machines – EGMs (or slot or poker machines) are the largest form of gambling by revenue (Productivity Commission, 2010). Only state run lotteries and scratch and win cards generate more revenue.

There is reported to be an association between EGM use and problem gambling. EGMs have been blamed for most problem gambling because problem gamblers are also intensive EGMs users (cf. Clarke et al. 2010; Martin and Moskos 2007). EGMs are seen as particularly ‘risky’, habit forming and addictive. They are often are referred to as the “crack cocaine” of gambling (Mizerski et al., 2001, Dowling; Thomas, Sullivan and Allen 2009), and are considered by many researchers as the most dangerous type of gambling available (Griffiths, 1990; Azmier, 2005). One proposed method to reduce EGM gambling is to use warning messages (Floyd, Whelan and Meyers 2006).
**Strong and Weak Warnings**

In the interactive world of online EGMs, these messages can be seen as strong or weak warnings, and are argued to play several roles. They help regular gamblers avoid ‘gambling dependency’ by reducing gambling intentions. They are also designed to disrupt and stop the ‘flow’ of gambling sessions (Williams, West and Simpson 2007). Additionally, many warnings are designed to improve decision making by allowing consumers to make better and more informed consumption choices (Bettman, Payne, Staelin 1986).

Strong and weak warnings fit the central and peripheral processing paradigm of the Elaboration Likelihood Model (ELM) by Petty and Cacioppo (1986). ELM predicts a message’s success by the route of persuasion determined by the amount of elaboration (processing) a person engages in a message they receive. Rucker and Petty (2006) argued that interactive messages are likely to benefit more from central route processing with more elaboration, resulting in a stronger effect on a recipient’s attitude. The assumption is that strong attitudinal change (i.e., using central processing) will result in faster change to the recipient’s behavior. Peripheral processing does not engage elaboration and takes longer to change behavior.

**Strong warnings**

Strong warning messages in EGMs would be of the type that prompts gamblers to use central processing in ELM. These warnings require a high degree of elaboration from the recipient because they interrupt EGM play, typically by using a ‘pop up’ window (e.g., Monaghan 2008) where the gambler must click on the strong warning to remove it in order to continue play. In EGM gambling, pop-up warnings have been reported being capable of promoting responsible gambling intentions (Monaghan, Blaszczynski and Nower 2009; Monaghan and Blaszczynski 2010; Coultier, Ladouceur and Sevigny 2006) and behavior (Coultier, Ladouceur and Sevigny 2006). Jardin and Wulfert (2009) found that a pop-up strong warning reduced the amount bet and the number of spins on a simulated EGM by university participants in their experiment. Coultier et al. (2006) tested a pop-up strong warning that did not need to be removed, and allowed EGM play to resume after seven seconds. They found that the warning did not significantly influence playing behavior although it did increase the participants’ understanding of the content of the “illusion of control” warning message.

Monaghan and Blaszczynski (2010) exposed respondents to a pop-up warning lasting fifteen seconds against a weaker warning that appeared as a static message on top of the EGM screen. Participants reported no significant differences in their self-appraisals of gambling intentions, length of intended gambling session and their need to have a break during the artificial EGM session. Monaghan and Blaszczynski did not measure actual gambling behavior.

**Weak warning**

In EGM gambling, a weak warning would be relatively non-intrusive and is argued to not prompt the gambler’s elaboration by using more subtle stimuli. This is often done through animation (e.g., a moving, ‘crawling’ message), or through elements like color, sound or symbols. In this manner, the warning seeks to elicit a reaction through the ELM peripheral processing route (Laughery et al. 1993). In this role, weak warnings serve as reminders (prime) of a message that is already familiar to the gambler. Rucker and Petty also proposed that the ELM peripheral processing route can elicit attitude (and therefore behavioral) change.
Weak warnings are the most regularly tested format in EGM gambling. They are presented in a format that does not interrupt gambling sessions, such as animated “scrolling” or “crawling” messages. Jardin and Wulfert (2009) found no significant differences in participants’ simulated gambling behavior, the amount they bet and the number of EGM gambling spins.

Measuring gambling behavior
EGM gambling behavior can be measured in several ways; the length of time spent gambling, the number of spins bet on during a gambling session, and the amount wagered during a session (Jolley et al. 2006). These behaviours can be collected automatically by the EGM during the course of play, capturing gamblers’ reactions to strong or weak EGM warning messages. Effective warnings should prompt a reduction in these gambling behaviors. This type of behavioral data differs from the gambling intentions captured through self-report surveys. This behavioral data can be used to test the causal relationship of strong and weak warnings in game play.

The following hypotheses can be developed from the literature:

\( H1: \) The (1) number of spins, (2) amount bet, and (3) session length will be significantly different between weak, strong and no (control) warnings.

\( H2: \) Strong warnings will reduce gambling behavior more than weak warnings.

Method

A field experiment was designed to test the hypotheses. The experiment used a web-based casino that was accessible from any computer connected to the internet. The casino operated 24 hours a day, seven days a week, during the experiment. The experiment was designed with multiple EGMs in order to look and give multiple EGM’s like a real e-casino. An Australian university gave ethics clearance authorizing and hosting this experiment. The experiment ran for 34 days.

Staff members and students of the hosting university who were above 18 years old were recruited as participants. This sample frame was necessary in order to verify the recruited individuals age through the institution’s staff-student registration database. Recruits had to complete the South Oaks Gambling Screen (SOGS) for problem gambling prior to registration. Individuals who scored they had potential gambling problems were excluded from the sample. Subjects were further screened for gambling experience and only those who had gambled in the last 12 months were selected.

Subjects could log-in and play as much or as little as they chose and could bet up to their total e-dollar earnings. They could also choose not to play. This increased the realism of the experiment by simulating conditions of online gambling that is largely done in the home environment or at work (Cotte et al., 2009). They played for a jackpot of $2,000 Australian Dollars that was awarded at the end of the experiment to the person with the highest account balance. Upon login, they were presented with a page from which they could choose EGMs to play.
This experiment tested whether warnings affected gambling behavior in regular gamblers; and if differences existed between strong, weak and no warning conditions. The strong warning treatment consisted of a pop-up containing three illusion of control/irrational belief messages (How much have you lost gambling today? Australians lost more from gambling last year than the federal government spent on schools. You will never win back the money you lost) that would appear after every 30 spins and obscure the EGM graphics to prevent further play. Subjects had to manually remove the strong presentation of warnings by clicking on it. A similar but cruder form of this warning has been tested with some success (Jardin and Wulfert 2009). The weak warning treatment consisted of the same messages as in the strong warning, but these ‘crawled’ across the lower part of the EGM screen. These messages sought to influence behavior via either the central (strong) or peripheral (weak) processing route of ELM. This warning format and wording has been tested by many researchers (e.g. Mognahan, Blaszczynski and Nower 2009; Monaghan and Blaszczynski 2010). The control treatment had no warnings or stopping of the game (strong).

Subjects were randomly allocated to three groups for exposure to different treatments. They were potentially exposed to a different treatment or control each time they logged in. This design offered a within subject design in order to eliminate ‘person’ effects. EGM pay-out was collected for 85% and 90%. There was no effect of payout level. Data was collected unobtrusively by the EGM software as the participants played (see tables 1 and 2).

Table 1 Breakdown of betting behavior

<table>
<thead>
<tr>
<th>Warning treatments</th>
<th>Strong n=288</th>
<th>Weak n=314</th>
<th>Control no-warning n=229</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of spins</td>
<td>Range 12.1 – 19.4</td>
<td>Range 22.2 – 36.3</td>
<td>Range 14.3 – 21.8</td>
</tr>
<tr>
<td></td>
<td>Mean 15.8</td>
<td>Mean 29.3</td>
<td>Mean 18.1</td>
</tr>
<tr>
<td>Amount bet in $</td>
<td>Range 13.3 – 22.2</td>
<td>Range 23.9 – 35</td>
<td>Range 18.5 – 31.3</td>
</tr>
<tr>
<td></td>
<td>Mean 17.7</td>
<td>Mean 29.5</td>
<td>Mean 24.9</td>
</tr>
<tr>
<td>Session length in seconds</td>
<td>Range 4.8 – 684.7</td>
<td>Range 168.5 – 268.8</td>
<td>Range 107.9 – 190.3</td>
</tr>
<tr>
<td></td>
<td>Mean 163.5</td>
<td>Mean 218.7</td>
<td>Mean 149.1</td>
</tr>
</tbody>
</table>

1. Data came from 141 respondents who were exposed to at least two treatment conditions.
Each respondent had made at least 60 spins (minimum of 30 spins for each treatment).
2. Mean number of spins = 82.77 for each condition; range 30 – 437.
Results and discussion

MANOVA (Analysis of Variance) was used to test for differences in the response patterns between the three experimental conditions.

Table 2 MANOVA to test for behavioral differences after exposure to different warnings

<table>
<thead>
<tr>
<th>Behavioral dimension &amp; type of measurement</th>
<th>Sig. Diff. btw groups (Tukey’s HSD)</th>
<th>Treatment condition</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
<th>Bartlett’s (B) Levene (L)</th>
<th>F-Statistic using Welch’s ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of spins (count)</td>
<td>Weak - strong * (p=.001)</td>
<td>Strong</td>
<td>15.8</td>
<td>31.4</td>
<td>288</td>
<td>B=.001 L &gt; 0.05</td>
<td>7.42</td>
</tr>
<tr>
<td></td>
<td>Weak - none * (p=.014)</td>
<td>Weak</td>
<td>29.2</td>
<td>63.5</td>
<td>314</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None</td>
<td>18.1</td>
<td>46.1</td>
<td>229</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strong – weak * (p=.005)</td>
<td>Strong</td>
<td>17.7</td>
<td>38.5</td>
<td>288</td>
<td>B=.001 L &gt; 0.05</td>
<td>4.91</td>
</tr>
<tr>
<td></td>
<td>Weak</td>
<td>Weak</td>
<td>29.5</td>
<td>49.9</td>
<td>314</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
<td>24.9</td>
<td>48.9</td>
<td>229</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p=.47</td>
<td>Strong</td>
<td>326.7</td>
<td>2775.8</td>
<td>288</td>
<td>B=.07 L &gt; 0.05</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>Weak</td>
<td>Weak</td>
<td>218.7</td>
<td>451.7</td>
<td>314</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
<td>149.1</td>
<td>316.6</td>
<td>229</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Slot machine players who logged on but did not play were excluded from this analysis. * denotes significantly different relationship

Contrary to the literature and hypothesized effects of warnings, subjects receiving strong warnings did not gamble less. Participants gambled significantly more when they were exposed to the weak warning. The findings were opposite to the expected direction of effect for warnings on gambling behavior. More severe warnings did not significantly reduce gambling behavior. In fact, for some dependent dimensions, warnings significantly increased gambling behavior. Subjects took significantly more spins when exposed to the weak warning (p=.001). This lends support to H1. Warnings seem to work because there are significant differences between the weak and no warning treatments (mean=29.2 vs. 18.1 spins), and between strong and weak warnings (mean=29.2 vs. 15.8 spins). This finding appears to show that warnings affect behavior, but the relationship between weak and no warnings is contrary to the direction that was hypnotized. H2 is partially supported with subjects gambling significantly less when exposed to strong warnings compared to when they were exposed to weak warnings. However, they gambled significantly more when exposed to weak warnings versus when exposed to no warning. There is a lack of a significant difference between strong and no warnings.

Subjects lost most of their money when there were no warnings. This suggests that they may take more risks in the absence of warnings. Alternatively, weak warnings may prompt them to bet more and to bet more often, but to bet more carefully. This may imply that warnings designed to be processed intensively via the peripheral ELM processing route may exert effects on the way EGM users bet.

This naturalistic experiment tested different EGM warning delivery methods on university students and staff. There are well documented limitations of generalizability with these samples. The reason for choosing this group partially resides in their level of comfort and
familiarity with making internet purchases and use of websites for game-playing. This appears to have translated to web-based gambling as no problems were encountered with their ability to use the technology. However, care should be taken when extrapolating the findings beyond this study.

This experiment is unique compared to other previous studies. It is the first naturalistic, longitudinal experiment using a realistic online casino. Previous research has relied on analogue settings and proxies for measuring gambling intentions, not behavior. More importantly, this research is the first to report a test of regular gamblers’ reactions to commonly used warning wording and delivery formats.

The results were contrary to what was expected. Regular gamblers reacted to the weak warning by gambling significantly more than when there was no warning. They bet more and had a higher number of spins. This unintended consequence of non-intrusive warnings is opposite to those reported for problem gamblers. However, this finding is consistent with many other researchers’ findings in the long history of research into warning communications (Beltramini 1988). Many warnings have unintended results when tested on regular users (Stewart and Martin 1994).

This raises questions about the wisdom of implementing warnings. Because all problem gamblers were once regular gamblers, increasing regular gamblers’ gambling behavior would suggest a possible escalation towards problem gambling. More research needs to be conducted to rule out unintended effects on consumers’ health.

**References**


