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Do Warning Signs on Electronic Gaming Machines Influence Irrational Cognitions?

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ABSTRACT

Recognizing that electronic gaming machines are over-represented among problem gamblers, governments have introduced responsible gaming legislation incorporating the mandatory display of warning signs on or near electronic gaming machines. Based on the cognitive model of gambling, these signs are designed to correct irrational and erroneous beliefs through the provision of accurate information on probabilities of winning and the concept of randomness. To date, however, there is minimal empirical data evaluating the effectiveness of government-mandated messages. In this study, 93 undergraduate students were randomly allocated to standard and informative messages displayed on an electronic gaming machine during play in a laboratory setting. Results revealed that a majority of participants incorrectly estimated gambling odds and reported high levels of irrational gambling-related cognitions prior to play. In addition, there were no significant between-group differences, and few participants recalled the content of messages or modified their gambling-related cognitions. The study suggests that signs placed on electronic gaming machines may have minimal impact in modifying irrational beliefs or altering behaviour. Implications for future research are discussed.

Introduction

Legalized gambling is a popular recreational activity with adult participation rates ranging from 60% to over 90% in Australia, North America, South Africa, Hong Kong, United Kingdom and several European countries (Petry, 2005; Shaffer, LaBrie, LaPlante, Nelson, & Stanton, 2004). Electronic gaming machines represent one of the most popular forms of gambling played by approximately 40% of the general adult population (Productivity Commission, 1999). However, electronic gaming machines have been associated with greater levels of gambling problems than any other form of gambling (Department of Internal Affairs, 2004¹; Productivity Commission, 1999; Responsible Gambling Council, 2006²). An estimated 75% to 90% of treatment seeking problem gamblers typically report impaired control over electronic gaming machine play, a testament to the powerful conditioning effects of this form of gambling (Delfabbro, 2008; Morgan, Kofoed, Buchkoski, & Carr, 1996).

Epidemiological studies consistently report elevated rates of problem gambling among adolescents and youth with the highest rates found within the 18 to 30 year age bracket (Delfabbro & Winefield, 1996; Derevensky & Gupta, 2004; Dickerson, Allcock, Blaszczynski, Nocholls, Williams, & Maddern, 1996; Productivity Commission, 1999). In addition, self-report data suggests that this age cohort features prominently among patrons of electronic gaming machines once they have reached the legal age for participation in venues (18 years in Australia; 21 years in North America) (Moore & Ohtsuka, 1997; Nower, Derevensky, & Gupta, 2004).

From the framework of cognitive psychology, it is postulated that irrational, gambling-related cognitions and misunderstanding concepts linked to randomness and probabilities represent the key components contributing to the initiation and maintenance of problematic gambling in general, and electronic gaming machines in particular (Blaszczynski & Nower, 2002; Coulombe, Ladouceur, Deshairnais, & Jobin, 1992; Gaboury & Ladouceur, 1989; Hardoon, Baboushkin, Derevensky & Gupta, 2001; McCusker & Gettings, 1997; Sharpe, 2002; Walker, 1992).

Support for the central role of maladaptive cognitions is found in studies showing that approximately three quarters of all gambling-related thoughts during electronic gaming machine play could be classified as irrational or erroneous in nature (Caron & Ladouceur, 2003; Delfabbro & Winefield, 2000; Gaboury & Ladouceur, 1989), and maladaptive cognitions account for differences between recreational and problem gamblers in response to gambling-belief questionnaires (Joukhador, Blaszczynski, & Maccallum, 2004; Joukhador, Maccallum, & Blaszczynski, 2003). In addition, treatment outcome studies reporting behavioural improvement in gambling in response to cognitive-behavioural (Echeburua, Baez, & Fernades-Montalvo, 1996; Ladouceur et al., 2001; 2003) and cognitive interventions (Toneatto & Sobell, 1990) further implicate maladaptive cognitions.

¹ Department of Internal Affairs. (2004, July). *Problem Gambling Levy 2004/05 – 2006/07*. Retrieved May 28, 2007, from <http://www.stv.govt.nz/diawebsite.nsf>

² Responsible Gambling Council (2006). *Electronic Gaming Machines and Problem Gambling*. Retrieved May 28, 2007, from <http://www.responsiblegambling.org>.

Applying the inherent assumptions of the cognitive model, some governments have decided to recommend or introduce legislation mandating the requirement to display warning signs on and/or near electronic gaming machines as one component of an overall responsible gambling strategic plan (Independent Pricing and Regulatory Tribunal, 2004; Productivity Commission, 1999; Wynne & Stinchfield, 2004). However, empirical studies have reported inconsistent findings regarding the effects of providing information or displaying informative signs in shifting or correcting of irrational beliefs. For example, Dixon (2000) reported that informing players that the act of picking numbers in the game of electronic roulette bore no relation to the outcome improved the accuracy of participants in estimating their chance of winning and in producing shorter durations of play compared to participants exposed to inaccurate information. Similarly, Benhsain, Taillefer and Ladouceur (2004) found that signs highlighting the independent nature of chance events during electronic gaming machine play significantly reduced erroneous verbalisations and session duration in a sample of occasional gamblers.

In contrast, Hing (2003) reported that the presence of government-mandated signs in venues and on electronic gaming machines were ineffective in modifying gambling-related cognitions and behaviours, though 67% of 864 patrons in Sydney clubs indicated they were aware of the signs. This is consistent with other studies noting that up to one-third of participants failed to notice displayed warning signs placed on electronic gaming machines (Focal Research, 2004) and that the level of statistical knowledge regarding odds and probabilities had little effect on gambling or problem gambling behaviour or on the amount of time or money spent gambling (Williams & Connolly, 2006).

The purpose of the current study was to evaluate whether warning signs, specifically designed to modify common irrational thoughts, would be more effective in shifting cognitions than standard government-mandated messages that simply listed probabilities of winning major prizes. The specific hypothesis tested was that participants who viewed informative signs would have fewer irrational cognitions and more accurate estimations of the chances of winning following play than those who view standard signs.

METHOD

Participants

This study was approved by the Human Ethics Committee of the University of Sydney (protocol number 01/03/38). Participants were 93 undergraduate psychology students (males=20, females=73). All participants spoke fluent English and received credits in a psychology course for participation. The mean age of the sample was 19.8 years (range: 18 - 38, SD = 3.64). Given the higher proportion of female students typically found in Psychology courses, the final sample was 78.5% female and 21.5% male. The majority (58.1%) of participants reported electronic gaming machine play in the past year.

Procedure

Participants were recruited using the School of Psychology's online subject pool system. Upon arrival at the laboratory, participants completed a baseline questionnaire assessing erroneous estimates of the chances of winning and common irrational beliefs regarding gambling on electronic gaming machines. Responses were rated on a

visual analogue ratings scale (ranging from 0 to 100). The study used an electronic gaming machine (Mk VI Series 2), provided by Aristocrat Leisure Industries and approved for research use by the New South Wales Liquor Administration Board under Section 8(2)(b) of the New South Wales Gaming Machines Act (2002)³. The machine was a standard configuration machine with a 91% return to player payout and graphics displaying prizes. Participants were randomly allocated to one of two conditions:

1. *Standard message*: (n = 45: males = 10; females = 35). A machine displaying a standard static sign containing information on the chances of winning in the text and size of wording mandated by the New South Wales Gaming Machines Regulation Act of 2002, Section 21: “Your chance of winning the maximum prize on a gaming machine is generally no better than one in a million”. The message was printed on a sticker placed to the left of the screen in bold black font on a white background with a red BetSafe stop sign in the background.
2. *Informative message*: (n = 48: males = 10; females = 38). This message was identical in physical design and presentation to the standard message but contained the following information: “The outcome of every game is randomly generated by the machine. It is not linked to previous results and cannot be influenced in any way by the machine or the player.” It was designed to correct a common erroneous cognition related to randomness.

Randomness was achieved by pre-determining the sequence of allocating participants to each condition by selecting numbers (1 = condition 1; 2 = condition 2) drawn by lot.

Participants were instructed to play for 10 minutes. In compliance with regulatory requirements imposed by the New South Wales Liquor Administration Board, no money was used in sessions; machines were pre-loaded with credits. Performance was measured by the display of credit points on the electronic gaming machine screen with participants encouraged to imagine they were in a real gambling situation playing for money.

Following play, participants completed a set of questionnaires specifically designed to assess how the displayed messages affected play. These included: (a) a free recall task, in which participants were asked to freely recall any messages seen on the machine during play; and (b) a cued recall task, in which participants were asked if they recalled seeing a sign concerning the outcomes of winning and the content of the message. Participants were also asked if the sign had any effect on thoughts during play. This was followed by post-test questionnaires identical to the baseline questionnaire designed to elicit erroneous estimates of chances of winning and irrational cognitions in relation to gambling. On completion of this task subjects were debriefed, given a debriefing information sheet prior to concluding the experimental session.

Measures

Erroneous Estimates and Irrational Beliefs Questionnaire (see Appendix A): Participants completed a pre- and post-test questionnaire (see Appendix A), designed

³ New South Wales Gaming Machines Regulation Act (2002, 2 April). Retrieved May 16, 2004, from <http://www.dgr.nsw.gov.au>

for this study to ascertain the number of erroneous estimates about chances of winning on an electronic gaming machine and the number of irrational beliefs related to gambling. Erroneous estimates were defined as those indicating an incorrect knowledge of the odds of winning, while irrational cognitions reflected distorted beliefs outcomes considered to be pre-determined (programmed) or able to be influenced by a player's skill. Four types of erroneous estimates were examined, including the perception of the probability of winning, losing or breaking even as well as the probability of winning the maximum prize. Participants estimated the chance of each event occurring in a single game from 0 to 100%. Participants' responses were coded as "accurate" if they reflected accurate knowledge of the probabilities of winning based on probabilities provided by the industry and regulated by the New South Wales Gaming Machine Regulation Act (2002). Since the probability of winning the major prize is less than one in a million, responses of 1% or less were classified as accurate. Return to player percentages are 91%, so responses of the chance of winning being 10% or less were considered accurate; similarly, the chance of losing was classified as accurate if participants gave a response of 90% or more. All other responses were coded as "inaccurate."

Based on previous research, the current study targeted five types of irrational cognitions: (a) illusions of control; (b) superstitious beliefs, (c) independence of chance events; (d) gambler's fallacy, and (e) misunderstanding of random outcomes. Participants indicated the extent they held each belief on a scale from 0 to 100%. Participant's responses were also coded as "accurate" or "inaccurate" based on the odds of winning on electronic gaming machines and "rational" or "irrational" based on the factors determining the outcome of electronic gaming machine play.

Free Recall Task: Participants were requested to freely recall and record all information that they remembered was displayed on machines during play and were given 2 minutes to record their responses on a blank piece of paper. The researchers provided no prompts or hints related to the nature of the information to be recalled. Responses were coded by the principle investigator as being either: "inaccurate", based on no response or erroneous information; "somewhat accurate", judged as responses indicating correct knowledge of the content of the message without replicating the exact wording; or "very accurate", judged as responses replicating the exact wording of the message.

Awareness of Signs and Estimated Effects on Future Play Questionnaire (see Appendix B): Participants were then asked to complete a memory and awareness task in a questionnaire format, designed to specifically target the harm-minimization message displayed on the electronic gaming machines, and to assess the extent to which that information was recalled by participants. Participants were cued by a question asking if they recalled a sign relating to outcomes of play or chances of winning and indicated "yes" or "no" before being asked to write down the exact content of the message. This step allowed a measure of claimed recall as compared with accuracy of recall. Similar to the free recall condition, responses were classified as "inaccurate," "somewhat accurate," or "very accurate." Participants were also asked whether (yes/no) the sign had influenced their thoughts during play, and to elaborate on this response. Finally, participants were asked to indicate (yes/no) whether the sign would affect future play.

RESULTS

Baseline Erroneous Perceptions of Chance and Irrational Beliefs

As shown in Table 1, the results indicated that all participants reported high levels of baseline erroneous estimations of chance prior to play. The majority (71.0 %, n = 66) of participants incorrectly estimated the chances of winning on an electronic gaming machine. Similarly, 72.0% (n = 67) incorrectly estimated the chance of losing. Furthermore, about 61.3% of participants (n = 57) were inaccurate in their estimations of the odds of winning the maximum prize. There were no significant differences in estimates of the chances of winning between males and females or between inexperienced and experienced players.

There were also high levels of baseline gambling-related irrational beliefs amongst all participants prior to play, with 74.2% (n = 69) of participants endorsing three or more irrational beliefs, 44.1% (n = 41) endorsing all five irrational beliefs, and all participants endorsed at least one irrational belief. Figure 1. shows the percentage of participants who endorsed each type of irrational belief. The most common irrational belief was the gambler's fallacy, endorsed by 97.8% (n = 91) of participants, followed by misunderstanding the random nature of outcomes (81.7%, n = 76) and the independence of outcomes (77.4%, n = 72). A majority of participants also endorsed illusions of control (55.9%, n = 62) and superstitious beliefs (55.9%, n = 62). Chi-square analyses found no significant differences in the irrational beliefs endorsed by participants according to previous electronic gaming machine experience or gender.

Sign Recall

Although 94.6% (n = 88) of participants reported they recalled seeing messages during play, only 21.5% of the sample (n = 20) accurately recalled messages related to the chance of winning the maximum prize or the outcomes of play. Participants were asked whether they recalled seeing a sign on the machine regarding the outcome of the game or chance of winning the maximum prize. Slightly more than half (54.8%; n = 51) of the participants stated they had no recall of the message during play. Twenty participants (21.5%) reported seeing and remembering the content of the message. When asked to recall the text of the sign, only 42 (45.2%) participants stating they recalled seeing the sign. This included 22.6% (n=21) of participants who demonstrated some recollection of the content of the sign, though only 9 participants (9.7%), were able to accurately recall its content.

Effect of Sign on Thoughts During Play

Only 22.6% (n = 21) of participants indicated that the messages had affected thoughts during play. There were no significant statistical differences based on gender, prior electronic gaming machine play, or message content. Participants were then asked to detail the effect of the sign on their thoughts. Responses ranged from "*It made me want to give up and leave the machine*" to "*Although I think I subconsciously knew it was all random, I started to think that betting on the highest stakes reaped more wins*".

The content of qualitative responses was analysed for themes and subsequently coded by the principle investigator. Resulting categories were: (a) Little or no effect/ignored

(34.4%; n = 32); (b) Continued to play to win and/or increase bet size (11.8%; n = 11); (c) Focused on small rather than large wins (3.2%; n = 3); (d) Decreased belief in winning (9.7%; n = 9); (e) Increased awareness of gambling-related cognitions (randomness, illusion of control) (6.5%; n = 6); (e) Caused me to stop and reconsider gambling behaviour (10.8%; n = 10); and (f) No reported effect (23.7%; n=22). Coded responses were quantitatively analysed by content, prior electronic gaming machine experience, and gender. Participants with no prior electronic gaming machine experience were significantly more likely to indicate no reported effect of the sign on thoughts during play than experienced electronic gaming machine players, $\chi^2 = 6.094$, $df = 1$, $p < 0.02$, *Cramer's V* = 0.256. There were no other statistically significant relationships among these variables.

Effect of Sign on Subsequent Electronic Gaming Machine Play

A substantial minority of participants (36.6%; n = 34) indicated that viewed signs would affect subsequent electronic gaming machine play. A higher proportion of inexperienced (51.3%, n=20) versus experienced (26.0%; n=14) electronic gaming machine players reported that the message would effect future play, $\chi^2 = 6.277$, $df = 1$, $p < 0.02$, *Cramer's V* = 0.260.

Erroneous Perceptions of Chance and Irrational Thoughts Following Play

In the post-test questionnaire, participants demonstrated increased accuracy in their estimations of the probabilities of winning on electronic gaming machines, as shown in Table 3. Only 60.2% (n = 56) of participants made inaccurate estimations. Accuracy also increased for participants' estimations of losing, with 58.1% (n = 54) giving inaccurate responses and 53.8% (n=50) indicating inaccurate estimations of the chance of winning the maximum prize.

As shown in Table 2., there were no significant changes in the participants' irrational beliefs following play; 75.2% (n = 70) of participants continuing to endorse at least three irrational beliefs, and 41.9% (n = 39) endorsed all five irrational beliefs. Differences in estimation of the chance of winning and irrational beliefs were also non-significant when analysed by message content, gender, or prior electronic gaming machine experience.

DISCUSSION

This study investigated the extent of gambling-related irrational beliefs in a sample of university students. Consistent with the literature, results revealed high levels of irrational beliefs across the whole sample irrespective of prior electronic gaming machine experience, and demonstrated a pervasive misunderstanding of the nature of electronic gaming machines and the determination of outcomes. Furthermore, a majority of participants were unable to report the correct odds of winning, losing and winning the maximum prize on electronic gaming machines. The main aim of the study was to investigate the effectiveness of mandated warning signs placed on electronic gaming machines as compared to more informative messages designed to target irrational cognitions. Contrary to our hypothesis, informative messages were not more effective in influencing player cognitions: the majority of participants failed to recall signs and, of those who did, only a minority recalled the content immediately following play. This finding suggests that static messages displayed on electronic gaming machines alone may prove insufficient to capture attention or communicate information that facilitates understanding of the message's content.

Less than one-quarter of participants indicated that the sign influenced thoughts during play, suggesting that harm-minimisation signs failed to modify gambling-related cognitions. These findings are consistent with a previous venue-based study that demonstrated that mandated signs had little effect on gamblers' thoughts (Hing, 2003).

The qualitative responses of participants also provide little support for signs as a harm-minimisation strategy. Though some participants indicated the message increased their rational thoughts and accuracy in estimations of odds as well as consideration of their gambling behaviour, other participants reported they continued to play, increased their bet size, or focussed on small rather than big wins. There was no difference in reported effects based on message content. However, this finding may be due to insufficient statistical power, as only a small number of participants indicated any effect.

There were a few notable differences between those who did and did not have prior experience with electronic gaming machine play. Non-electronic gaming machine players were more likely than those who had played electronic gaming machines before to report that warning signs had no effect on them. However, they were more likely to indicate that the signs might affect future play. Since comprehension and compliance are higher for salient warnings (Wogalter, Conzola, & Smith-Jackson, 2002), it is possible that participants who have never played electronic gaming machines may perceive harm-minimisation signs as relevant only to problem gamblers. However, this group may be more cautious about gambling and predict that they would attend to warning signs if they played in the future. In contrast, those with prior electronic gaming machine familiarity may be more cognisant of the need for responsible gambling strategies but less likely to believe that signs alone will have a moderating effect on play.

In contrast to our hypothesis that informative messages specifically targeting irrational thoughts would result in fewer irrational beliefs following play, there were no significant post-play changes in gambling-related irrational beliefs using the mandated messages or targeted messages. However, overall, participants did become more accurate in estimating the chances of winning, losing, and winning the maximum prize following play. This may indicate that, immediately following a session of play, gamblers may become more cognisant of the accurate probabilities of winning. However, this effect is likely short-lived, evidenced by the lack of differences in baseline cognitions between experienced and inexperienced players

In addition to the obvious methodological limitations of using a convenience sample of students in the study, the research has other limitations. First, the greater proportion of females in the sample may have minimised detectable gender differences. Second, research approval was conditional upon removing or disabling any devices for inserting or removing money from the electronic gaming machine. As participants were not risking money they were not at risk of harm in this simulated gambling paradigm. While the inability to play with money may not have affected play, it may have affected cognitions, as players would be less likely to exercise the same degree of rational appraisal when playing for their money versus credits alone. As a consequence, they might have been more likely to ignore or minimize the relevance of

messages. These factors may have reduced the capability of signs to impact cognitions as participants did not perceive any potential harm. Unfortunately, given the legislative requirements that electronic gaming machines modified for research purposes not be played with money, this limitation was unavoidable. Third, though participants were volunteers, they gained credit for their psychology course by participating, which may have biased the outcome by resulting in inattention during play or while responding to questions. However, a majority of participants gave positive feedback and indicated they enjoyed the experience, expressing interest in the research outcomes, suggesting interest in participation.

Despite these limitations, this study provides an important empirical test of the validity of a legislated harm-minimisation strategy for electronic gaming machines. The harm-minimisation strategies used in this study conformed to all the recommendations of the Productivity Commission (1999). They provided accurate and easily accessible information to assist all players in gambling-related decisions without overtly affecting recreational gamblers and within the overall aims of increasing knowledge of correct probabilities and how outcomes are determined and modifying irrational and erroneous cognitions. However, this study shows that simply providing players with this information is insufficient to facilitate informed choice, as the majority of participants reported that they did not recall the sign and the sign did not affect their thoughts during play.

Furthermore, the presence of signs did not lead to an intended reduction in gambling-related irrational and erroneous cognitions. Consistent with research on the effectiveness of tobacco and alcohol warnings, signs placed on electronic gaming machines do not appear to affect gamblers cognitions, the first step in modifying harmful behaviours. Therefore, while the use of signs placed on electronic gaming machines as part of a responsible gambling campaign fulfils all the recommendations of both legislators and industry, it is unlikely to prove effective as a harm-minimisation strategy.

The high levels of irrational cognitions, misunderstandings of the nature of electronic gaming machines and inaccurate estimations of winnings in a population of undergraduate university students confirms previous findings of elevated levels of gambling-related problems amongst this cohort (Delfabbro & Winefield, 1996; Dickerson et al., 1996; Productivity Commission, 1999). It highlights the need for effective harm-minimisation strategies to be designed and implemented to minimise potential gambling-related harm.

Given the low rates of recall of the harm-minimisation signs, it was not unexpected that signs had minimal effect on thoughts. Warnings signs must be noticed to be effective, and the static messages appear to be unable to capture and maintain attention in such a way as to facilitate message comprehension. Pop-up messages that appear on the screen of electronic gaming machines during a forced break in play screens may be more effective than static signs, placed on the front of electronic gaming machines, in capturing attention and facilitating information. The use of pop-up messages on electronic gaming machines has been previously associated with reduced session length and decreased expenditure (Cloutier, Ladouceur, & Sevigny, 2006; Ladouceur & Sevigny, 2003; Schellink & Schrans, 2002). Subsequent studies should test the effectiveness of pop-up messages compared to current mandated static

responsible gambling signs as a harm-minimisation intervention. In addition, message content should be evaluated relative to women and men. Further empirical testing in a gambling venue is warranted to determine which strategies utilizing signs and messages are most effective in reducing gambling-related irrational cognitions and erroneous beliefs to foster informed choice and ultimately alter gambling behaviour.

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Gambling signs & irrational thoughts

	Actual Odds	Mean Estimation	Standard Deviation	Range
Winning	<10%	24.8%	15.9	60
Losing	>90%	75.3%	19.0	98
Winning the maximum prize	< 1%	7.2%	8.9	50

Table 1. Participants' (N=127) baseline estimations of winning on an electronic gaming machine prior to play

	Prior to play	Following play
Gambler's Fallacy	97.8%	90.3%
Misunderstanding random outcomes	81.7%	77.4%
Misunderstanding the independence of chance events	77.4%	78.3%
Illusions of control	55.9%	57.8%
Superstitious beliefs	55.9%	55.9%

Table 2. Percentage of participants (N=127) who endorsed each type of irrational belief before and after play on a simulated electronic gaming machine

Gambling signs & irrational thoughts

	Actual Odds	Mean Estimation	Standard Deviation	Range
Winning	<10%	22.1%	17.2	70
Losing	>90%	76.5%	19.6	99
Winning the maximum prize	<1%	6.9%	11.3	60

Table 3. Participants' (N=127) estimations of winning on an electronic gaming machine after play

APPENDIX A
Erroneous Estimates and Irrational Beliefs Questionnaire

Please answer the following questions, rating your answers between 0 – 100% by placing a cross (X) on the appropriate place on the scale.

1. **What do you think is the chance that you will come away with more money than you started with after one session of playing an electronic gaming machine?**

0---|---10---|---20---|---30---|---40---|---50---|---60---|---70---|---80---|---90---|---100%

2. What do you think is the chance that you will win the maximum prize playing an electronic gaming machine?

0---|---10---|---20---|---30---|---40---|---50---|---60---|---70---|---80---|---90---|---100%

3. What do you think is the chance that you will break even overall after one session of playing an electronic gaming machine?

0---|---10---|---20---|---30---|---40---|---50---|---60---|---70---|---80---|---90---|---100%

4. What do you think is the chance that you will come away with less money than you started with after one session of playing an electronic gaming machine?

0---|---10---|---20---|---30---|---40---|---50---|---60---|---70---|---80---|---90---|---100%

5. How much control do you think that you have over the outcome of a game on an electronic gaming machine?

0---|---10---|---20---|---30---|---40---|---50---|---60---|---70---|---80---|---90---|---100%

6. How much do you think a player's skill impacts on the outcome of a game on an electronic gaming machine?

0---|---10---|---20---|---30---|---40---|---50---|---60---|---70---|---80---|---90---|---100%

7. How much do you think past spins impact on the outcome of a game on an electronic gaming machine?

0---|---10---|---20---|---30---|---40---|---50---|---60---|---70---|---80---|---90---|---100%

8. If the machine has not paid out for some time what do you think are your chances of winning on the next few spins?

0---|---10---|---20---|---30---|---40---|---50---|---60---|---70---|---80---|---90---|---100%

9. To what extent do you think are the wins determined by random outcomes?

0---|---10---|---20---|---30---|---40---|---50---|---60---|---70---|---80---|---90---|---100%

APPENDIX B

Awareness of Signs and Estimated Effects on Future Play Questionnaire

1. Do you remember seeing a sign on the machine concerning the outcome of the game or the chances of winning the maximum prize? (Please circle)

YES

NO

2. Do you remember what this sign said? (Please circle)

YES

NO

3. What did the sign say about the probabilities of winning?

4. Did this sign have any effect on what you were thinking about while you were playing? (Please circle)

YES

NO

5. In what ways were your thoughts affected by this sign?

6. Do you think that if you played again that this sign would affect how you play? (Please circle)

YES

NO