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Sally M. Monaghan
University of Sydney

Alex Blaszczynski
University of Sydney

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Sally Monaghan has also published under the name of Sally Gainsbury

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Electronic Gaming Machine Warning Messages: Information versus self-evaluation

Sally Monaghan & Alex Blaszczynski

Address correspondence to Sally Monaghan, School of Psychology, Brennan MacCallum Building (A19), The University of Sydney, NSW 2006, Australia;

sallym@psych.usyd.edu.au (email).

Abstract
Warning signs have been applied extensively in many health domains with the aim to enhance knowledge and shift attitudes and behaviours in an effort to reduce associated harm. More recently, regulatory agencies have applied similar strategies within evolving responsible gambling platforms. The effectiveness of these signs is influenced by both their physical attributes and content. Gambling warning signs traditionally focus on informing individuals of the potentially risky outcomes of gambling and the odds of winning, encourage gambling within affordable limits, and/or advertise counselling services. The limited evidence suggests that, similar to alcohol and tobacco, warning signs in gambling attract attention and improve knowledge but are generally ineffective in modifying player's thoughts and behaviours. This paper therefore aims to review the relevant literature to determine the optimal content of messages that will enhance responsible gambling practices. It is concluded that, in contrast to signs displaying probabilities or informing players of the risks associated with gambling, signs designed to encourage players to reflect on, appraise, evaluate and self-regulate their actions have greater theoretical and empirical support. It is recommended that warning signs should promote the application of self-appraisal and self-regulation skills rather than the simple provision of information on odds and probabilities to maximize their effectiveness as a public health tool.

Key words: Addiction, electronic gaming machines, problem gambling, public health policy, warning signs

Introduction

Public health campaigns frequently utilize warning signs and educational campaigns to inform individuals of potential risks and hazards associated with exposure to, and/or the excessive consumption or misuse of a range of products and lifestyle behaviours. The objective is to reduce population-based rates of personal injury, morbidity or mortality. The primary intent is not to restrict individuals from consuming products or participating in risky activities but to provide sufficient, timely and relevant information to enable informed choices and decisions that foster appropriate use, reduce risk, and avoidance of harmful consequences. The principle is founded on the premise that producers must inform consumers of any and all real or potential risks and/or hazards associated with the consumption of a product. This is balanced against the consumer's responsibility to comply with recommended guidelines and instructions.

An imbalance in these respective responsibilities (failure to inform or inappropriate consumption) results in tensions (as a result of public health concerns) that may need to be resolved through regulatory interventions or public health initiatives. Government regulations enforce governance and industry behaviour to make products or their provision safer, while public health initiatives are calculated to moderate consumption or use by shifting community attitudes and behaviours through educational campaigns and warning signs.

Gambling represents a popular recreational activity worldwide with the majority of individuals gambling within affordable limits. However, it is recognized that excessive gambling produces harmful effects across several inter-related spheres of functioning:

financial, personal, social, employment and legal (Abbott, 2007; Petry, 2005; Stucki & Rihs-Middel, 2007). Harm is not restricted to the consumer but extends to immediate family members and the broader social community (Productivity Commission, 1999). Studies indicate that 0.9-2.7% of adults experience serious, and an additional 2.0-4.2 %, significant gambling-related problems (Abbott, 2007; Petry, 2005; Productivity Commission, 1999; Shaffer & Hall, 2001; Stucki & Rihs-Middel, 2007; Volberg & Abbott, 2005; Welte, Barnes, Wieczorek, Tidwell, & Parker, 2003). While it is not possible to gauge the true and full psycho-social direct and indirect costs of excessive gambling given limitations related to causality and measurement, evidence does suggest that it is substantive in both financial and emotional terms (Delfabbro, 2008).

Electronic gaming machines (EGMs) account for a significant proportion (60%) of Australia's total net gaming expenditure (Australian Gaming Council, AGC, 2007) and have been identified as the primary form of gambling associated with problem gambling with estimates that 70% to 90% of treatment seeking gamblers report problems with this form (Collier, 2008; Delfabbro, 2008).

In response, and following public health guidelines in the field of substance abuse, responsible gaming legislation enacted in many international jurisdictions have mandated the display of signs in gaming venues and on EGMs. These signs are intended to complement and supplement other school and media based educational campaigns. The focus of warning signs is to inform players of the potential risks, hazards and addictive nature of gambling, odds and probabilities of winning, and where assistance may be

sought for those in need. The rationale for using warning signs is based on two premises. Firstly, it is assumed that at the aggregate level the ultimate decision to gamble remains the responsibility of the individual but to properly make decisions individuals must be fully informed (Blaszczynski, Ladouceur, & Shaffer, 2004; Korn, Gibbins, & Azmier, 2003). The gaming industry is vested with, and cannot abrogate the responsibility of providing relevant information regarding the risks and hazards associated with the consumption of its products and to take active steps at all levels to minimize consequent harm (consumer protection). Secondly, from a cognitive framework, displaying information on the odds and probabilities of winning is founded on the premise that correcting misconceptions and erroneous beliefs commonly observed in populations of problem gamblers will ultimately moderate behaviours (Ladouceur, Sylvain, Boutin, & Doucet, 2002; Toneatto, 1999).

The impact of warning signs on player cognitions and behaviours is predicated on several factors including physical attributes and message content. Physical attributes refer to the physical characteristics and location of signs that attract the intended recipient's maximum attention. Relevant parameters include size, colour, signal words (for example, caution, warning, hazard, or danger) and/or recognizable symbols, conspicuous location and absence of competing background distractors (Wogalter, Conzola, Vincent, & Smith-Jackson, 2002).

Message content refers to the degree of directness, simplicity and comprehension of the words that communicates the appropriate level of danger, consequences and/or actions to

avoid harm (Wolgater, 2006). The extent to which the message is read, absorbed and acted upon is dependant upon the personal relevance of the message and the targeted recipient's capacity to assimilate the information, and motivation to respond (cost-benefit analysis).

The complexity and questionable effectiveness of warning signs in informing and modifying attitudes and behaviours is evident in the reported outcomes associated with warning signs displayed on tobacco and alcohol products. For example, a large scale telephone survey of adult smokers conducted in the US, UK, Canada, and Australia (N=9058) found that there were significant gaps in smokers' understanding of the risks of smoking, despite the use of health warnings on cigarette packages informing smokers of these risks (Hammond, Fong, McNeil, Borland, & Cummings, 2006). Evaluative studies of alcohol warnings in the US similarly demonstrating a slow and limited positive impact on awareness but lack of corresponding behavioural change (Stockley, 2001).Comparable findings have been reported for gamblers. In a survey evaluating a range of responsible measures in Sydney clubs, Hing (2003) found that the majority of respondents indicated noticing venue signs informing players of risks associated with gambling and chances of winning maximum prizes (Hing, 2003) but that awareness did not modify thoughts or behaviours suggesting that signs did not promote actual responsible gambling practices.

Further, the premise and empirical evidence underlying the cognitive model of problem gambling supporting the assumption that informing gamblers of probabilities and correcting cognitions leads to behavioural change is yet to be fully established. As noted

by Delfabbro (2004), the literature does indicate that the majority of people are not rational in their understanding of gambling and that this may act to maintain problem gambling but that there are also a range of social, cultural and economic variables explaining the aetiology of problem gambling.

Reference to the effectiveness of randomized cognitive-behavioural treatment outcome studies in modifying gambling behaviour (Dowling, Smith, & Thomas, 2007; Echeburua, Baez & Fernandez-Montalvo, 1996; Ladouceur et al., 2001; Ladouceur, Sylvain, Boutin, Lachance, Doucet, & Leblond, 2003; Petry et al., 2006; Petry, Weinstock, Ledgerwood, & Morasco, 2008; Sylvain, Ladouceur, & Boisvert, 1997) does not necessarily support the model. In the main, these studies fail to assess the direct or dose dependent relationship between shifts in erroneous/irrational cognitions and behavioural change, that is, confirming that targeted cognitions were actually modified post treatment and that such changes were causally related to behavioural improvement. Similarly, while Breen, Kruedelbach and Walker (2001) reported significant reductions in post therapy gambling specific attitudes and erroneous beliefs using the Gambling Attitude and Beliefs Survey (GABS; Breen & Zuckerman, 1999), these authors did not assess concomitant changes in gambling behaviour. Thus the process of change within cognitive therapy remains unknown: it is possible that extraneous variables may cause synchronous changes in both cognitions and problem gambling behaviours though the operation of other specific or non-specific therapeutic mechanisms.

Raising further question over the validity of the cognitive model, is the absence of differences in the percentage of erroneous cognitions verbalised during play between problem and non-problem gamblers (Benhsain, Taillefer, & Ladouceur, 2004; Ladouceur, 2004; Petry, 2005), and the finding that prior knowledge of statistics and understanding of probabilities does not protect against the verbalization of erroneous cognitions during play (Benhsain & Ladouceur, 2004), or that successfully increasing knowledge leads to changes in actual gambling behaviour (Williams & Connolly, 2006).Similarly, the finding that exposure to erroneous behaviour leads to persistence in gambling can be accounted for by potential non-cognitive factors as acknowledged by Caron and Ladouceur (2003).

In light of these findings, the utility and effectiveness of warning signs in the domain of gambling requires more systematic analyses, both in respect to physical attributes and message content, and in the context of the questionable validity of the cognitive model. This paper therefore aims to provide an overview of the theoretical basis and evidence supporting current warning messages and to offer new directions in the design of optimal message content. To achieve this, we conducted a literature review of publications in PsychInfo and Medline databases using the following keywords related to gambling: warning and information signage.

Information on odds and probabilities of winning and the nature of EGM play

A number of studies have demonstrated an apparent discordance between statistical knowledge and participation levels in gambling behaviour. In Williams and Connolly's

(2006) study, 470 university students participated in either a semester of probability and statistic lectures and labs concentrating on gambling, or attended non-math control lectures. Results confirmed that the statistical course improved the student's ability to calculate gambling odds and their awareness of common irrational thoughts compared to the non-math control students. However, no between group differences were found in self-reported decreases in likelihood of gambling, being a problem gambler, amount of time and money spent, or attitudes towards gambling.

Similarly, Evans, Kemish and Turnbull (2004) found that university students were significantly slower to adjust gambling behaviour to maximize monetary return compared to less-educated participants (who had left school at the age of 16) leading the authors to suggest that abstract knowledge may interfere with optimal gambling behaviour. Likewise, in contrast to those unaware of actual odds, students educated on probabilities of winning were found to gamble on unlikely outcomes more often than statistically optimal (Hertwig, Barron, Weber, & Erev, 2004). This is consistent with Steenbergh et al.'s (2004) findings that university students viewing warning messages and those correcting erroneous beliefs and probabilities, were just as likely to gamble on roulette as students who did not view these messages.

In a laboratory study employing a commercial EGM displaying standard messages, either in static form or scrolling across the screen every three minutes, the majority of 92 undergraduate university students failed to accurately report correct odds of winning after a session of play (Monaghan & Blaszczynski, 2007). Of those able to accurately recall

the sign's content (85% of those exposed to the dynamic, and 24%, the static sign), 37% incorrectly reported the displayed odds of winning. This suggested that individuals' exposure to information on probabilities fail to modify their beliefs leading them to overestimate the likelihood of winning.

Irrational beliefs, including illusions of control and superstitions, are commonly found amongst regular gamblers and are regularly accepted to be involved in the maintenance of gambling (Gaboury & Ladouceur, 1989; Walker, 1992). Laboratory research has provided support for the use of messages designed to target and modify common irrational beliefs regarding the nature of EGM play (Benhsain, Taillefer, & Ladouceur, 2004; Cloutier, Ladouceur, & Sevigny, 2006; Dixon, 2000; Floyd, Whelan, & Meyers, 2006; Steenbergh et al., 2004). Additionally, cognitive correction techniques that teach individuals to challenge irrational beliefs and erroneous perceptions regarding gambling have been shown to significantly improve problem gambling with long-lasting therapeutic gains (Ladouceur et al., 2001).

However, while laboratory studies have shown some reductions in irrational thinking outside gambling situations immediately following exposure to informative signs, there is little support for such signs to modify actual gambling behaviour. Furthermore, while cognitive therapy may be an effective way of treating problem gambling in an intensive individual or group therapy setting, there is no evidence that these techniques are effectively learnt through signage provided in venues. Given findings that increased knowledge of probabilities and awareness of irrational thoughts does not lead to changes

in gambling behaviour (Steenbergh et al., 2004; Williams & Connolly, 2006), it can be extrapolated that simply providing gamblers with accurate information regarding the nature of play would be insufficient to change gambling behaviour.

These findings are consistent with theoretical models of behavioural change. Wogalter and Laughery (1996) argue that for warnings to be successful, messages should be in agreement with existing attitudes and beliefs, or be persuasive enough to evoke changes toward agreement, so that the message motivates the user to comply. Research indicates that over 70% of regular gamblers' thoughts are irrational during play, and that individuals who have rational thoughts regarding the nature of play prior to play, become irrational during gambling sessions. This demonstrates the robust nature of irrational cognitions in gambling (Benhsain et al., 2004; Delfabbro & Winefield, 2000) and suggests that simply providing correct information may be ineffective in altering player's attitudes and beliefs.

Therefore, evidence suggests that while knowledge seems to be a necessary precursor leading to behavioural change, it appears that knowledge of statistics and probabilities of winning and the nature of EGM play are not sufficient to change gambling behaviour. Furthermore, signs merely providing factual information without informing players what behaviour is appropriate will therefore have a limited impact on behavioural change.

Risks Associated With Gambling

Does cautioning players that gambling is ‘addictive’ or may lead to ‘harmful’ consequences influence behaviours? Consistent with warning signs used for tobacco and alcohol products, many jurisdictions have mandated signs detailing negative consequences of gambling be displayed in venues and on EGMs but research on attitudes and persuasion demonstrates that a focus on risks may be too narrow (Leventhal, 1970). This is consistent with evaluation of tobacco and alcohol products showing warning labels, which do not appear to reduce high risk behaviours such as drink-driving or consumption of tobacco and alcohol during pregnancy (Engs, 1989; Fischer, Krugman, Fletcher, Fox, & Rojas, 1993; Hankin et al., 1993; Krugman, Fox, Fletcher, & Rojas, 1994; Parker, Saltz, & Hennessy, 1994). Similarly, in a survey of regular gamblers in Sydney clubs, only 2% of participants indicated that signs warning of gambling risks had resulted in changes to their gambling behaviour (Hing, 2003).

Wogalter and Laughery (1996) argue that hazard perception is closely related to familiarity such that when people are more familiar with a product, they are more confident in their ability to use it safely and less likely to perceive hazards involved with its use. This may lead to regular gamblers dismissing or discounting the relevance of warning signs resulting in such signs being ineffective in facilitating responsible gambling behaviour. If a warning is perceived to be consistent with a person’s beliefs and attitudes, that person must still be motivated to comply with its directives (Wogalter & Laughery, 1996).

A critical determinant of motivation is the perceived cost of complying. Warnings signs describing potential risks may be perceived as suggesting that one should not gamble at all, that is, to remain abstinent. If so, individuals may view the costs of complying as unattractive and outweighing the perceived benefits and therefore will not be motivated to change behaviours. As such, warning signs should aim to clarify how one may gamble responsibly without losing all the perceived benefits of gambling.

A higher proportion of young adults (aged 18-30) appear to manifest gambling-related problems compared to other age cohorts (Delfabbro & Thrupp, 2003; Derevensky & Gupta; Productivity Commission, 1999; Shaffer & Hall, 2001) therefore it is essential that warning signs are effective in this population segment. Research into the effectiveness of warning messages on tobacco products shows that young adults tend to perceive themselves as invulnerable to the negative consequences of smoking, and have difficulty relating to negative consequences that may occur in the future (Fisher et al., 1993; Fox, Krugman, Fletcher, & Fisher, 1998; Leventhal, Glynn, & Fleming, 1987). A more recent longitudinal study with adolescents by Mazanov and Byrne (2007) provided evidence suggesting there is no correlation between awareness of health consequences of smoking and decisions to start or stop smoking. Furthermore, smokers were found to be slightly more knowledgeable about the health consequences of smoking than non-smokers and, in general, adolescents appeared to over-generalize the negative health consequences of smoking and believe that smoking causes all illnesses (Mazanov & Byrne, 2007). This finding suggests that knowledge of risks does not impact hazardous behaviours amongst youth.

Alcohol warning signs have been shown to be equally ineffective amongst youth, for example, one study showed young adults perceived more benefits than risks from alcohol warnings (Snyder & Blood, 1992). These findings indicate that warning signs designed to educate youth about potentially risky behaviours may be too extreme in consequences portrayed resulting in youth discounting information perceived as not being applicable to them.

Use of Temporal Reminders

Temporal reminders signs are dynamic messages appearing intermittently on EGM screens during play deigned to inform players when they have been playing continuously for a set period of time. Studies have investigated a variety of frequencies ranging from signs that appear every six games to every 60 minutes of play. To date, the effect of reminding players of time spent on cognitions during play remains untested.

Currently in most international jurisdictions there is no central tracking system among EGMs that would allow an individual player to be tracked between machines and within sessions to accurately monitor time spent gambling. For example, if a machine is played down to zero credits, a player may elect to play another change machines, or insert further monies resetting the EGM and the parameters specifying the timing of the display of signs (that is, rather than a continuation of play, a new session is established). This means that individuals may play for extended sessions without being exposed to these messages.

Blaszczynski, Sharpe, and Walker (2001) assessed the gambling behaviour of 779 participants from clubs and hotels. Using recorded data extracted from a series of machines, these authors found the average time recreational (non-problem) gamblers played for one session was less than thirty minutes (M=28.8, SD=35.8) while problem gamblers played on average for 41.6 minutes (SD=31.7). During this time recreational gamblers played an average of 2.24 machines (SD=3.76) compared to an average of 2.12 machines (SD=3.13) for problem gamblers. These results demonstrate that players do not play one machine consistently for periods of 60 minutes, so a message triggered by 60 minutes of play would not be effective. Furthermore, if an individual did reach 60 minutes of play on one machine, a pop-up message stating this may be underestimating the total amount of time spent gambling on other machines, and so provides inaccurate information underestimating time expenditure that may encourage further gambling behaviour. If time-reminders are to be used, it is proposed that these messages should be displayed at least every 30 minutes, a rate shown to have success in alerting players to time and money spend playing (Schellink & Schrans, 2002). More frequent messages may be hypothesized to have a greater impact but these need to be empirically validated.

Self Monitoring and Appraisal

To control their behaviour, individuals must monitor actions to evaluate whether they are on track and if further self-regulatory effort is needed. Self-monitoring refers to an individual tracking targeted aspects of their behaviours (Polaha, Allen, & Studley, 2004). Research has demonstrated that self-monitoring is generally associated with behavioural

change, typically in the desired direction, that is, problem behaviours typically decrease when self-counted while desired ones become more frequent (Gilberts, Agran, Hughes, & Wehmeyer, 2001; Hardeman, Johnston, Johnston, Bonetti, Wareham, & Kinmonth, 2002; Schwedes, Siebolds, & Mertes, 2002).

Pathological gambling is characterized by loss of control over gambling and continued gambling despite negative consequences. Therefore, harm-minimization strategies should aim to assist individuals to remain in control of their gambling-behaviour by making an informed choice each time they play. Several theoretical models, including the frequently applied Social Learning Theory (Bandura, 1977), support the need for self-awareness to enable behavioural change. Cognitive-behavioural models of gambling suggest that cognitive biases become automatic and lead to the prolongation and loss of control over gambling sessions (McCusker & Gettings, 1997), therefore, an individual must become aware of these irrational thoughts and beliefs in order to gamble in a rational manner. Furthermore, Sharpe and colleagues (Sharpe, 2003; Sharpe & Tarrier, 1993) argue that individuals with poor coping strategies are particularly at risk of failing to control their gambling, as are highly-impulsive individuals, given both these groups have reduced rational cognitive engagement with their gambling behaviour. As these individuals have difficulty initiating self-monitoring and self-awareness, external cues such as signs prompting this behaviour may assist them in appropriate behavioural regulation.

To assist individuals in making informed decisions, messages encouraging gamblers to monitor their behaviour and compare it to their standards, for example, the amount of

time and money they intended to spend may increase self-awareness and, hence, control of behaviour. Responsible gambling strategies encouraging individuals to evaluate behaviours, particularly amount of time and money spent during a session, may reduce the risk of harm caused by gambling by allowing individuals to appraise and adjust behaviours appropriately. By reminding gamblers to evaluate behaviours and assess requirements for a break, signs may facilitate informed choice and, therefore, increase responsible gambling behaviour.

Warning messages that encourage self-awareness overcome some of the barriers faced by signs designed to provide players with information since they may be perceived by each individual in terms of their own unique situation and period of play. Self-awareness messages are designed to evoke an individual's attitudes and beliefs motivating them to pursue a course of action consistent with their cognitive schemas and objectives. Furthermore, in addition to encouraging self-appraisal, signs should also offer an appropriate behavioural action. For example "*Do you know how long you have been playing for? Do you need to take a break?"* encourages players to reflect on their own behaviour in light of their own attitudes and beliefs and provides an alternative, low-cost behavioural option to follow, if it is deemed appropriate.

Warning signs that focus on individual's own subjective norms also avoid the problem of over-exposure or wear-out faced by warning signs that provide information. Bernstein's research (1989) suggests that informative warning signs result in the same message being received multiple times causing a reduction in message effectiveness over time. This

effect has been found for warning labels on tobacco products as demonstrated by a large scale survey conducted in Canada that found the majority of youth and adult smokers perceived that the warning labels introduced in 1994 had lost their effectiveness (Environics Research Group, 1999). As self-appraisal messages encourage individuals to reflect on their own behaviour during individual gambling sessions, such messages may not result in the same decrease in effectiveness as warning signs providing the same information repeatedly.

Monaghan and Blaszczynski (2008) evaluated optimal message content for warning signs during computer-simulated EGMs play in a sample of young adult regular gamblers. The impact of signs informing chances of winning major prizes or that outcomes were determined randomly, was compared with self-appraisal messages encouraging players to reflect on the time or money spent and to consider the need to take a break. Results revealed that self-appraisal messages had a significantly greater impact on participants' thoughts and behaviour, both during a simulated gambling session and on subsequent gambling sessions in the two weeks following exposure. Players reported that the self-appraisal messages significantly influenced awareness of time spent playing, length of gambling sessions, and likelihood of taking breaks compared to informative or control (blank) messages. This suggested the effectiveness of self-appraisal messages in modifying player's thoughts in a manner that facilitates responsible gambling behaviour. Furthermore, although self-appraisal messages did not contain any information, participants who viewed this message became significantly more accurate in their estimations of the chances of winning suggesting that, although the messages did not

directly target irrational beliefs, players were able to become more accurate and rational in their thinking. Overall, the empirical data supports the use of self-appraisal messages as appropriate message content for warning signs on EGMs.

Conclusion

Warning signs are extremely important in protecting consumer freedom and enabling individuals to use potentially risky products in a safe manner while minimizing risks of harm. An evaluation of the literature on the use of warning signs to encourage responsible gambling suggests that current initiatives are not effective in protecting individuals from gambling-related harm. Signs containing information regarding the chances of winning, risks associated with gambling or describing how outcomes are determined may have some success in increasing player knowledge, but have been shown to be generally ineffective in modifying gambling-related thoughts or behaviour. Warning signs that are designed to inform players when they have been playing for a continuous period of time are ineffective due to the difficulties in accurately tracking individual gambling play. Until further empirical evidence establishes a causal relationship between the provision of information and/or modification of cognitive errors and gambling behaviour, it may be prudent to investigate alternative message contents that may minimize excessive gambling. One approach may be to focus on signs that encourage players to reflect on the amount of time or money they have spent, compare expenditure to personally set limits and consider whether appropriate self-regulatory action is needed may assist individuals to gamble responsibly. It is recommended that key-stakeholders consider implementing warning signs with appraisal oriented message

contents to enhance the potential of this harm minimization strategy to reduced gambling-related harms.

Author Notes

Sally Monaghan is a PhD Candidate (Clinical Psychology, 2009) at the University of Sydney. Her current research interests include gambling and addictions, responsible gambling and prevention strategies, youth, online gambling, and online treatment and support options.

Professor Alex Blaszczynski holds a chair in Psychology at the University of Sydney. His current research interests include pathological gambling, impulse control behaviours, and the measurement of irrational beliefs.

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