



Optimal content for warning messages to enhance consumer decision making and reduce problem gambling



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ABSTRACT

Warning messages for electronic gaming machines (EGMs) have been mandated to increase consumers' ability to make informed rational decisions and reduce excessive gambling consumption. However existing warnings have limited effectiveness. This paper presents the results of the first in situ trial of dynamic warnings for EGMs to evaluate the impact of message content. A series of dynamic warning messages was displayed across EGMs in venues. Gamblers (N = 667) completed surveys to assess message recall and impact on thoughts and behaviours. Participants recalled messages that encouraged self-appraisal to a greater extent than messages providing information. Both message types had a small impact on behaviour by reducing gambling consumption. Messages that specifically discuss money spent appear to have the greatest impact. Salient and effective warnings that interrupt continuous and excessive consumption can serve as the first line of defence in the prevention of harmful behaviours and impede consumers' movement towards addiction.

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1. Introduction

Dynamic warning messages are a harm minimisation strategy aimed at preventing or reducing gambling-related problems and promoting responsible gambling behaviours. When delivered correctly, warning messages have the potential to assist individuals to make informed choices about their gambling. Responsible gambling messages are predicated on warning messages used across wider health and addiction fields to promote healthy behaviours and discourage risky ones (Blaszczynski, Ladouceur, & Shaffer, 2004; Monaghan & Blaszczynski, 2010a). The premise is based on the assumption that consumers choose their levels of involvement but governments and gambling operators retain a duty of care or some measure of responsibility in protecting participants from harm (Blaszczynski et al., 2004; Delfabbro, 2008).

Addictive behaviour is reflected in the pathological pursuits of some form of reward or relief from stress in a compulsive manner (Martin et al., 2013). Disordered gambling has been classified as a behavioural addiction in the latest edition of the DSM (DSM-5, American Psychiatric Association, 2013) due to research demonstrating clinical, phenomenological, genetic, neurobiological, and other similarities with disordered

alcohol and substance use (Potenza, 2014). Disordered gambling is the first and only behavioural addiction to be recognised as pathological, however other conditions based on compulsive and excessive consumption were considered, including compulsive Internet use, gaming, shopping, and sex. One marketing and consumption framework suggests that marketing cues can impact the progression along the consumption continuum, including moving individuals away from addictive behaviours (Martin et al., 2013). Examples include the use of interruptions to consumption in the form of pop-up warnings combined with consumer education campaigns.

Warning messages are a common form of consumer protection against threats to health and safety (Mayer & Scammon, 1992). However, research suggests that warning messages used for gambling are generally ineffective and have little impact on changing consumer attitudes, thoughts or gambling behaviours (Monaghan & Blaszczynski, 2010b). Although warnings have been implemented and evaluated across a range of public health domains, including alcohol and tobacco, few in situ trials have been conducted to test gambling messages, as most studies on warnings have been conducted in labs with simulated gambling (Monaghan & Blaszczynski, 2010a). This paper presents the results of an in situ trial of warning messages in a real gambling venue with regular gamblers to determine the impact of message content on gamblers' thoughts and behaviours. The aim of this paper was to advance theory and knowledge on how warning messages can be effectively used to reduce compulsive and excessive consumption of gambling, with implications for other addictive behaviours.

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2. Literature review

Disordered gambling is a recognised mental health disorder characterised by spending excessive money and/or time gambling due to a loss of control over behaviour that results in significant negative consequences (APA, 2013). Internationally, problem gambling prevalence rates range from 0.2% to 2.3% (Fong, Fong, & Li, 2011; Gainsbury et al., 2014; Petry, 2005; Wardle et al., 2007). Problem gambling is increasingly recognised as an important public health issue that must be addressed by governments and industry operators, similar to the harm reduction strategies required in other public health domains such as alcohol and tobacco (Gainsbury, Blankers, Wilkinson, Schelleman–Offermans, & Cousijns, 2014). Although there is no single accepted conceptual model of problem or disordered gambling, it is widely acknowledged that negative consequences are caused by excessive gambling expenditure, which is motivated by a range of individual, social, and environmental factors (Blaszczynski & Nower, 2002; Hodgins, Stea, & Grant, 2011). Harm reduction strategies can target gambling products and environments, as well as factors contributing to individual behaviour including irrational beliefs about the probabilities of winning and how outcomes are determined (Gainsbury & Blaszczynski, 2012).

Warning messages aim to reduce excessive consumption of risky products by assisting consumers to make informed decisions. Warning messages are often mandated by governments for products that pose substantial consumer risks, including alcohol, tobacco, and gambling products. Gambling warning and responsible gambling messages target all gamblers due to the recognition that gambling is a risk-based activity and related harms are experienced on a continuum of severity, from no problems to problem or disordered gambling (Currie et al., 2006; Shaffer, 2005). Warning messages are commonly mandated for display in relation to electronic gaming machines (EGMs), due to the association between this type of gambling and gambling problems (Dowling, Smith, & Thomas, 2005). EGMs are the most problematic form of gambling reported by around two-thirds of gamblers who seek treatment within Australia, New Zealand, Canada, and the UK (Abbott, 2006; Dowling et al., 2005; Gainsbury, Russell, et al., 2014; Productivity Commission, 2010). The Australian Productivity Commission estimated that around 15% of regular EGM players are problem gamblers, with a further 15% experiencing moderate to severe harms (Productivity Commission, 2010).

Warnings are effective only if they alter behaviours of concern (Hadden, 1991; Wogalter & Dingus, 1999). Meta-analyses addressing the varied findings on warning messages across product warnings do effectively increase safe behaviours although with varying rates of behavioural compliance (Argo & Main, 2004; Cox, Wogalter, Stokes, & Tipton Murff, 1997). Although the use of warnings is not new, the most appropriate content for warning messages is yet to be determined. Historically, warning messages for gambling have aimed to inform gamblers of factual information about the probabilities of winning or how outcomes are determined. These messages were predicated on the use of warnings for alcohol and tobacco products, warning consumers about the risks associated with excessive or inappropriate use (e.g., risks of driving while intoxicated and smoking while pregnant). The use of informative or educational messages is based on the concept of problem gambling being a result of irrational thoughts and beliefs, based on the theory that if gamblers understood the games and probabilities of winning they would be able to make an informed decision regarding their involvement (Blaszczynski & Nower, 2002; Blaszczynski et al., 2004; Sharpe, 2002). However, research suggests that effectively communicated knowledge does not modify irrational beliefs or erroneous estimations of the chances of winning (Monaghan, 2008; Steenbergh, Whelan, Meyers, May, & Floyd, 2004; Williams & Connolly, 2006). This is likely due to cognitive biases that enable gamblers to understand the low probabilities of winning, yet to believe that they may still have a chance to win (Williams & Connolly, 2006). This is consistent with research on

the impact of warnings for alcohol and tobacco products that demonstrate these messages generally increases consumer awareness of the potential negative consequences, but have a very limited impact on actual risky behaviours (Fischer, Krugman, Fletcher, Fox, & Rojas, 1993; Hankin et al., 1993; Ringold, 2002; Stockley, 2001).

Due to the limited success of educational messages on modifying compulsive and problematic consumption of potentially harmful products, further research is required to evaluate more effectual wording for warning messages. Existing research, including from marketing and consumer behaviour fields, suggests that important elements of consumer communication include language, tonality, and message content (Argo & Main, 2004; Cox et al., 1997). The type of language used in warning messages has been suggested to have varying impacts on individuals depending on culture, emotional state, level of gambling problem and the consumer's sense of self-esteem (Rothman, Kelly, Hertel, & Salovey, 2003; Rothman & Salovey, 1997; Rothman, Stark, & Salovey, 2006). Nower and Blaszczynski (2010) found that attitudes to gambling are related to self-perception rather than winning or losing. They suggest that warning messages should be designed to appeal to the individual's sense of value and that it is important that messages do not embarrass the player or stigmatise the consumer as a problem gambler. The use of positive framing of messages has been found to have a greater impact than negative framing (Akl, Oxman, Herrin, Vist, et al., 2011). Positive or gain-framed messages discuss the benefits of improvements that can be made, while negative or loss-framed messages contain information about harmful consequences and hazards related to risky behaviours. Neuroimaging research has found that gain-framed messages are more effective in improving risky choice behaviours than loss-framed message among individuals with substance-use disorders (Fukunaga, Bogg, Finn, & Brown, 2013; Krawitz, Fukunaga, & Brown, 2010). Creating persuasive messages that aim to target at-risk populations may assist consumers to resist or desist from unsafe behaviours (Fukunaga et al., 2013; Monaghan & Blaszczynski, 2010a).

Following the lack of success of informative messages that identify the risks associated with excessive and compulsive consumption, warning messages have been created that aim to encourage consumers to reflect on their own personal situation. Messages can encourage self-appraisal by making reference to an individual's life, needs, and interests, as well as to specific obstacles to achieving a desired change (Chua et al., 2011). Self-appraisal messages are expected to increase consumers' ability to engage in self-referential processing and to perceive the message as self-relevant (Strecher, 2007). Subsequently, heightened self-appraisal may enhance recall of messages, through greater processing of messages. Message recall is often necessary to enable superior message impact in terms of persuasion, resulting in desired behavioural changes. Adapting warning messages to encourage more personally relevant consideration departs from warnings that simply aim to inform consumers through the provision of education.

Self-appraisal messages have been shown to be effective in changing risky behaviours in several health domains. For example, neuroimaging study found that individuals with substance-use disorders were less likely to perceive less informative messages to be self-relevant in a manner that impacted their risky behaviours (Fukunaga et al., 2013). Similarly, a trial of messages for smoking cessation compared personalised messages about a person's history to generic informative messages (Chua et al., 2011). The study found that personal statements increased neurological activation in self-related processing regions and predicted quitting during a four-month follow-up. As smoking and substance-use are highly co-morbid with gambling and problem gambling (Hodgins et al., 2011) these findings may suggest that gambling messages must also be perceived to be personally relevant to be effective in enabling behavioural change.

Self-appraisal messages are particularly relevant for compulsive gambling as research shows that having accurate knowledge of gambling probabilities and understanding games does not influence

gambling behaviour (Williams & Connolly, 2006). Warning messages presented during EGM sessions that prompt gamblers to initiate self-monitoring and self-awareness may assist them in appropriate behavioural regulation (Monaghan, 2008). Using simulated EGMs in laboratory and real gambling venues, Monaghan and Blaszczynski (2010b) demonstrated that messages encouraging self-appraisal (e.g., “Have you spent more than you intended? Do you need to think about a break?”) had a significantly greater reported effect on thoughts and behaviours than informative messages (e.g., “Your chances of winning the maximum prize are generally no better than one in a million”). Self-appraisal messages reportedly facilitated participants within-session awareness of the time spent playing, the likelihood of taking a break and length of gambling sessions both within the current (simulated) session and in subsequent real gambling sessions in the two weeks following the experimental session. Self-appraisal messages also encouraged participants to have more realistic thoughts regarding gambling and the chances of winning. Subsequently, dynamic warning messages that appear on EGM screens (e.g., pop-up messages) that encourage consumers to reflect on their own individual gambling consumption at the current moment have been implemented in Canadian provinces. These have been recommended for implementation in other international jurisdictions, including Australia (Productivity Commission, 2010).

In addition to message content, the structure of warning messages makes an important contribution to message impact. Messages that are structurally novel have been shown to provoke thoughtful action (Berlyne, 1971; Langer & Abelson, 1972; Langer, Blank, & Chanowitz, 1978). Research on persuasion has shown that when individuals generate arguments and conclusions themselves, these are more convincing than statements provided by external sources (Glock, Müller, & Ritter, 2013). This is likely as individuals tend to trust themselves and self-generated arguments are often perceived as more accurate than information provided by external sources (Hoch & Deighton, 1989; Levin, Johnson, & Chapman, 1988; Mussweiler & Neumann, 2000). Furthermore, explicit informational statements can be perceived as being told what to believe, which can lead to resentment and defiance (Clee & Wicklund, 1980; O’Keefe, 1997). In contrast, messages that imply a particular conclusion but allow perceivers to draw their own conclusions may reduce feelings of resentment and enhance the persuasiveness of messages (Kardes, Kim, & Lim, 1994). One way to encourage users to self-generate arguments is to use questions in warning messages. Inclusion of questions in anti-smoking campaigns and smoking warning labels has been found to be more effective in influencing short-term smoking behaviour than anti-smoking arguments provided from an external source (Glock et al., 2013; Müller et al., 2009; Müller et al., 2014).

The potential effectiveness of dynamic warning messages prompting self-awareness requires further testing in real gambling venues as part of an actual gambling session. Previous research on gambling warning messages has largely been conducted in laboratories or using simulated gambling. Although controlled empirical research does provide a basis for improving the communications effectiveness of warning messages, in situ trials with the intended audiences are necessary tests of messages (Mayer & Scammon, 1992). Similarly, Stewart and Martin (1994) suggest that to assess consumer reactions accurately, research should approximate as close as possible the situation in which a warning will be noticed and followed. It is particularly important to evaluate warning messages in commercial environments to ensure no unintended consequences result, as some marketing cues designed to ward-off harmful consumption may actually contribute to increased consumption (Martin et al., 2013; Ringold, 2002). For example, there is evidence that anti-smoking PSAs that demonstrate the harmful health consequences of smoking results in increased tobacco consumption among some smokers (Martin & Kamins, 2010).

The aim of this research was to evaluate the effectiveness of dynamic warning messages for EGMs in commercial gambling venues to determine the optimal content to facilitate responsible gambling. The specific

objective was to determine the effect of various warning message content on gamblers in terms of recall and impact on thoughts and behaviours. It was hypothesized, that messages that encouraged self-appraisal would be recalled to a greater extent and be more effective in terms of enhancing responsible gambling behaviours than messages containing informational statements. These variables are critically important to determining the efficacy of warning messages as they integrate individual psychological frameworks into understanding message impact (Wogalter & Cox, 1998). A hierarchy of effects model posits that a warning must be noticed, before consumers can make appropriate self-regulatory actions; however, awareness of warnings does not lead automatically to compliance (Stewart & Martin, 1994). This is consistent with the five dimensions of effectiveness proposed by Argo and Main (2004) that represent the sequential processing of information that consumers engage in when they are exposed to warnings: attention, reading and comprehension, recall, judgments, and behavioural compliance. This paper aimed to advance theory and knowledge on how warning messages can be effectively used to reduce compulsive and excessive consumption of gambling, with implications for other addictive behaviours.

3. Method

3.1. Participants

The sample comprised of 667 participants drawn from patrons visiting one of five gambling venues, from the Brisbane region of Queensland, Australia. Just over one-third ($n = 229$; 34.3%) of these respondents were obtained from a Large Club, while the remaining respondents were collected from one of three hotels: Hotel 1 ($n = 134$, 20.1%), Hotel 2 ($n = 153$, 22.9%), Hotel 3 ($n = 118$, 17.7%), or a Small Club ($n = 33$, 4.9%). There was a majority of males in the sample (71.5%) and 43.6% of the sample were younger than 40 years of age (age range: 18–90+, mean age = 45.1; SD = 20.0). According to responses to the Problem Gambling Severity Index (PGSI), 35.5% of the participants were classified as non-problem gamblers, 33.1% were classified as low risk gamblers, 23.5% as moderate risk, and 7.8% as problem gamblers.

3.2. Message development

A rigorous process was used to identify and select the messages to be used in this trial.

An extensive literature review was undertaken as the first step to identify the range of different responsible gambling messages that have been used internationally and to seek evidence of best practice. These included messages from other sources including messages from non-gambling public health campaigns in Australia and internationally, and recommendations from stakeholders and experts in the gambling field. This resulted in the compilation of a list of 40 messages that were considered for use in the trial. To comply with the functionality of machines used in the trial all messages were less than or equal to 40 characters.

The potential messages were analysed using Linguistic Inquiry and Word Count Software, which identified the strength of emotions in the messages. Messages that had a negative or punitive tone were removed. The main intention was to ensure that the proposed messages contained no elements of stigmatisation towards gambling or problem gambling.

The messages were grouped into themes of self-appraisal and informative messages. The defining characteristic of self-appraisal messages was that they included a question to prompt players to consider the messages with regard to their own current situation. Informative messages may have provided similar content, but were phrased as a statement. The key distinction between these message types were that informative messages were designed to be viewed as a statement

providing advice, whereas self-appraisal messages were designed to encourage players to question their own gambling and draw their own conclusions about the appropriateness of their behaviour. The inclusion of structural differences between messages enabled further exploration of the theory of effective message communication. Key stakeholders including representatives from government, industry groups, and leading academic researchers were consulted and asked to provide feedback on the messages. This was done iteratively until the list was reduced to 20 messages.

Five focus groups were conducted to test the messages with people who play EGMs. The focus group participants were assessed as to their level of gambling risk using the PGSI. One focus group comprised people who were assessed as low risk gamblers. Two focus groups comprised people assessed as medium risk gamblers, and another two group comprised people who were assessed as problem gamblers. Based on the results of the focus groups eight messages were chosen that represented a range of themes that were identified as potentially useful by participants. Four informative and four self-appraisal messages were selected to be included in the trial that would enable further testing of the optimal message content. The messages used in the trial are shown in Table 1.

3.3. Trial

Ethics approval was granted from a University Human Research Ethics Committee prior to commencement of the project. The technical configuration of EGMs meant that messages were displayed either as a pop-up message in the middle of the screen or at the bottom or top of the screen, depending on the individual machine manufacturer and game type. In total the venues had 443 EGMs, with the Large Club making up the largest proportion (63%) of all EGMs included in the trial with the remaining venues providing approximately 10% of the total EGMs respectively (approximately 40 machines per venue).

The messages were presented on all EGMs within a venue at the same time, regardless of whether they were currently being played. The frequency of display of messages was not consistent across venues. The messages appeared every 15 min for a period of 15 s for all venues at the commencement of the project. The messages at the Large Club displayed messages once every hour for a period of 10 s, at the request of the venue. The messages were divided into two groups and rotated on a weekly basis, such that the first group of four messages (messages A, B, C and D) were displayed across all venues and remained in place for one week, followed by the second group of messages (messages E, F, G and H). This sequence continued for the duration of the trial.

Messages were initially displayed on every EGM from March 2013 and surveys were conducted in each venue in April ($n = 269$), June ($n = 150$), August ($n = 129$), and October ($n = 119$) when all messages were removed from the EGMs. Participants in the trial only completed the survey once. Surveys were collected across days and times, however as the evenings and later in the week were the busiest times the bulk of the surveys were completed on Fridays, Saturdays, and Sundays and during the evening.

Table 1
The eight messages used in this trial.

Label	Message	Theme
A	Have you spent more than you can afford?	Self-appraisal
B	Is money all you are losing?	Self-appraisal
C	Set your limit. Play within it.	Informative
D	Only spend what you can afford to lose.	Informative
E	Do you need a break? Gamble responsibly.	Self-appraisal
F	Are you playing longer than planned?	Self-appraisal
G	A winner knows when to stop gambling.	Informative
H	You are responsible for your gambling.	Informative

A team of 11 research assistants were engaged for the duration of the project to conduct the surveys. Survey research has generally found that face-to-face interviews are the preferable way to administer gambling research surveys, including measures of problem gambling, as this fosters better rapport and subsequently elicit more candid and honest responses (Williams & Volberg, 2009). Face-to-face surveys also increase recruitment rates of somewhat hard-to-reach populations, including young people (Williams, Volberg, & Stevens, 2012).

3.4. Measures

The research assistants read the survey questions to participants and recorded their responses. The survey included several sections, including:

- *Demographics*: Standard demographic information was collected including age, gender, and language spoken at home.
- *Free recall*: Respondents were asked whether they had seen a message on EGMs. If they reported having seen a message they were asked to freely recall the text of this message, which was recorded verbatim.
- *Message impact*: All respondents were shown the complete list of messages and asked which were most influential or had the biggest impact for them. The respondents were then asked to report specifically on how the messages they recalled influenced their thoughts and EGM play. The respondents gave a free response, which were then coded into themes.
- *Perception of messages*: Respondents were asked to indicate the effect the messages had on their enjoyment when playing and about the overall impact of the messages with the following response options useful/beneficial; neutral; useless; frustrating/annoying. More than one response was allowed.
- *Problem Gambling Severity Index (PGSI)* (Ferris & Wynne, 2001): The PGSI is a nine-item instrument to assess gambling risk levels and is able to classify respondents as being at no-risk, low-risk, moderate risk, or a problem gambler based on their total score. The PGSI has good psychometric properties and is widely used in Australian and international research (Jackson, Wynne, Dowling, Tomnay, & Thomas, 2010).

3.5. Analysis

Recalled messages were coded independently by two members of the research team to assess accuracy. Accuracy was determined by whether the content freely recalled could be clearly identified as matching one of the messages. Where a message did not accurately match one of the eight messages but reflected content that reflected the general responsible gambling message themes (e.g., gambling excessively, needing to appropriately manage gambling), it was coded as a general self-appraisal or general informative message, as appropriate. The two members of the research team agreed on the vast majority of their ratings. Any inconsistencies were resolved via discussion until agreement was reached.

Respondents could indicate up to three messages as being impactful, and were asked to rate these in order of perceived influence. In order to give more weight to the statements that were selected as the most influential and less to those selected as the least influential, the responses were given a weighting (first choice = weight of 3, second choice = weight of 2, third choice = weight of 1).

The quantitative data was analysed with the aid of the statistical software package tool IBM SPSS Statistics. Due to the nature of the data, encompassing mainly categorical data, the main form of testing utilised were chi-square tests.

4. Results

4.1. Message recall

Of the 667 respondents surveyed, 290 (43.5%) recalled seeing messages on the EGMs. Of the respondents that reported having seen a message displayed on EGMs, 164 (56.6%) respondents accurately freely recalled one message, 29 (10%) accurately freely recalled two messages and one respondent accurately freely recalled three messages. The proportion of respondents that recalled each message is presented in Fig. 1, which demonstrates that Messages A, C, and E, were the most commonly recalled messages. A further 33 respondents reported a message with a self-appraisal theme related to excessive gambling and 17 respondents reported a general informative message related to excessive gambling that did not accurately match one of the messages. Self-appraisal messages were recalled significantly more frequently than informative messages, with 136 self-appraisal messages recalled, compared to 71 informative messages. This difference was statistically significant, $\chi^2(1, N = 207) = 20.41, p < 0.001$.

4.2. Message impact

Fig. 2 illustrates that messages A and D were viewed as particularly impactful, followed by C and G, whereas E and F were not particularly impactful. Informative messages were reported to be impactful by 50.0% of respondents in comparison to 45.6% of respondents who indicated that self-appraisal messages were impactful.

4.3. Thoughts

In terms of specific reported impacts on thoughts, the most commonly reported thoughts related to informative messages were: “wanted to keep playing” ($n = 19$), “thought about how much money I was spending” ($n = 12$), “thought about how long I had been playing” ($n = 9$), “thought about taking a break” ($n = 5$) and “thought about cashing out” ($n = 2$). Only three of 71 respondents who recalled informative messages reported feeling annoyed/frustrated by these messages. The pattern of most commonly reported thoughts for self-appraisal messages was similar to that for informative messages, with the most common responses from the 136 respondents who recalled self-appraisal messages being: “wanted to keep playing” ($n = 27$), “thought about how much money I was spending” ($n = 23$), “thought about how long I had been playing” ($n = 19$), “thought about taking a break” ($n = 6$), and “thought about cashing out” ($n = 4$). Fourteen

respondents out of 136 reported feeling annoyed or frustrated by these messages.

4.4. Behaviours

In terms of impact on gambling behaviours, among respondents who reported being influenced by informative messages the most common reactions were to read the message ($n = 26$), immediately push the button to continue ($n = 12$), not react to the message ($n = 11$), leave the message on the screen until the time elapsed ($n = 6$), look around at other players or machines ($n = 5$), talk to somebody nearby ($n = 3$), cash out and leave gaming area ($n = 2$) and check their phone ($n = 1$). The reported behaviours among those who reported self-appraisal messages were similar to those who saw informative messages that respondents were most likely to: read the message ($n = 34$), play at the same rate ($n = 32$), not react to the message ($n = 24$), immediately push button to continue ($n = 13$), look around at other players or machines ($n = 7$), leave the message on the screen until time elapsed ($n = 7$), play on at a decreased speed ($n = 5$), cash out and leave the gaming area ($n = 5$), talk to somebody nearby ($n = 4$), play on and decrease credit bets ($n = 3$), play on and increase credit bets ($n = 1$), play on and increase their speed of play ($n = 1$), and take a cigarette break ($n = 1$).

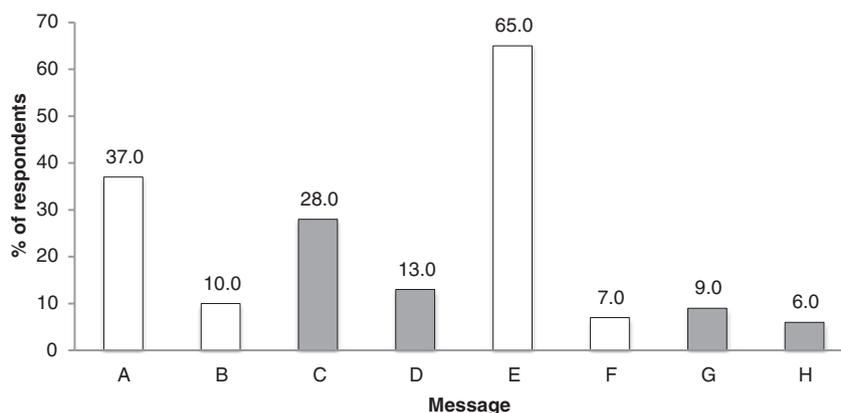
4.5. Perceptions

Respondents were asked to indicate how each of the messages they had rated as impactful had influenced their enjoyment of EGM play. There were no significant differences between the messages in terms of the effect on enjoyment, which was reported to be unchanged by 82.9% of respondents discussing informative messages and 75.4% of those referring to self-appraisal messages. Only a minority of respondents indicated that messages had improved their enjoyment (4.9%, 2.9% of informative and self-appraisal respectively), or reduced their enjoyment of EGM play (12.2%, 11.7% respectively).

As shown in Fig. 3, there was also no significant difference between self-appraisal and informative messages in terms of their perceived usefulness overall (both were perceived as useful). Only a minority of respondents reported that they perceived the messages to be useless or frustrating or annoying.

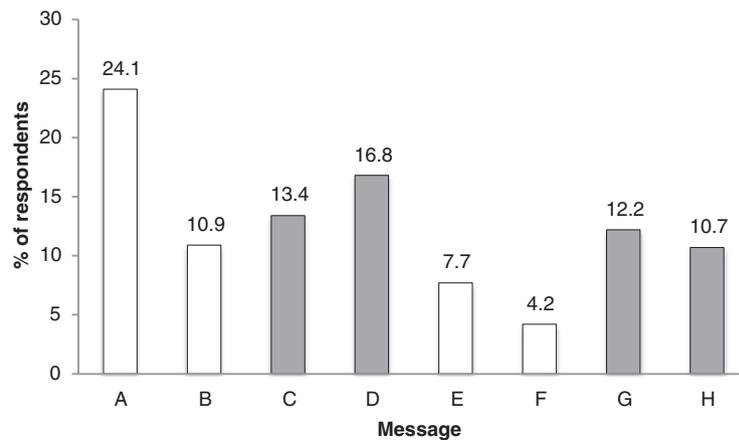
5. Analysis by venue and PGSI group

As there were differences in terms of the types of machines and message display times between messages in the various venues, the



Note: Grey bars are informative messages and white bars are self-appraisal messages.

Fig. 1. Proportion of respondents who recalled seeing a message that freely recalled each message to an identifiable degree of accuracy. Note: Grey bars are informative messages and white bars are self-appraisal messages.



Note: Grey bars are informative messages and white bars are self-appraisal messages.

Fig. 2. Proportion of respondents who recalled seeing a message that rated each message as being impactful, weighted by order of impact. Note: Grey bars are informative messages and white bars are self-appraisal messages.

results reported above were compared between venues. Most results did not differ significantly between venues. Where differences were observed, in all cases, the Small Club ($n = 33$) differed from all other venues, with no significant differences between the Large Club and the three Hotels for any of the analyses. As the statistics for the Small Club are based on a relatively small number of respondents, we are hesitant to draw any firm conclusions. Furthermore, as the interval between messages and the relative proportion of each type of machine in the venues mostly differed between the Large Club and the other venues, there are no results to support any differences based on these variables.

We were also interested in testing whether the messages had differential impact on those with different levels of problem gambling. No significant results were found for any comparison between PGSI groups in terms of any of the dependent variables reported above. For example, when comparing recall of self-appraisal or informative messages, 53.3% of non-problem gamblers reported recalling one of the self-appraisal messages as their first reported recalled message, which was not significantly different to the 53.7% of low-risk gamblers, 58.9% of moderate risk gamblers and 64.4% of problem gamblers who did the same, $\chi^2(3, N = 608) = 2.84, p = 0.417$.

6. Discussion

This was the first in situ trial of dynamic warning messages in EGM venues that specifically investigated the effectiveness of different

message content. The results provide a critically important extension of previous laboratory research and studies from related fields demonstrate that dynamic warnings are an effective intervention to minimise harms related to gambling. Both informative and self-appraisal messages appear to facilitate responsible gambling by encouraging consumers to think about their time and money spent. Respondents generally considered the messages to be useful, and there were no negative unintended consequences observed.

Our hypothesis was partially supported as self-appraisal messages were recalled to a greater extent than informative messages. These results are consistent with previous studies of warning messages for EGMs, which found that self-appraisal messages were recalled significantly more accurately two weeks following exposure during a single session, as compared to informative messages (Monaghan & Blaszczynski, 2010b). Self-appraisal messages also appeared to have a greater reported impact on facilitating immediate behavioural change that may reflect responsible gambling through informed consumer decision making. However, three of the top four most impactful messages were informative messages and informative messages had similar impacts on players as self-appraisal messages. Self-appraisal and informative messages did not substantially differ in other ways. That is, neither was seen as more beneficial than the other, nor were there differences in terms of their effect on enjoyment. This demonstrates that both types of messages used were a valid and useful way to communicate with players. Informative messages differed from previously tested

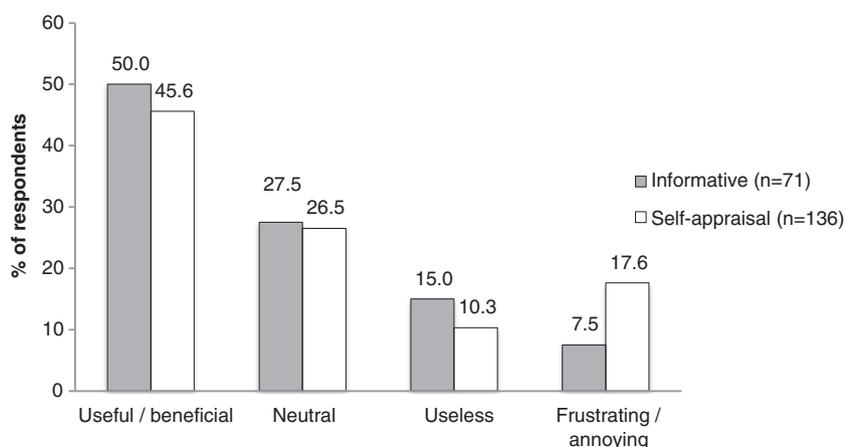


Fig. 3. Perceptions of message impact among respondents who reported being influenced by each type of message.

informative messages in that, although they were phrased as statements, the messages used in this trial targeted personal behaviour. Subsequently, the effectiveness of informative messages in the current trial may reflect the greater personal relevance of these messages as perceived by gamblers. It is possible that the similar content between informative and self-appraisal messages accounted for the lack of significant difference between these messages.

The most commonly reported impact of messages on respondents' thoughts was that they wanted to keep playing. This does not necessarily reflect a lack of impact, as continued play may be an appropriate decision for those who are gambling within appropriate levels, which the majority of consumers are likely to do. All other reported impacts on thoughts were consistent with the aim of messages, that is, to facilitate responsible gambling. The reported impact of messages being read, or causing respondents to look at other players or machines, talk to other players, or take actions other than continued play suggests that they created at least a small break in play. Breaks in play, even short periods, are important to enable gamblers to be aware of the amount of time and money they have spent, check in with their surroundings and be able to more accurately assess their current situation and make an informed decision regarding their ongoing gambling (Monaghan & Blaszczynski, 2010b; Wohl, Gainsbury, Stewart, & Sztainert, 2013). Immediate behavioural changes as a result of seeing the messages were not readily apparent. This is not surprising as behavioural change typically takes place over a period of time and is based on a complex interaction of thoughts, attitudes and intentions (Monaghan & Blaszczynski, 2010a).

Importantly, no unintended negative consequences were apparent as a result of the messages. The majority of respondents considered the message to be useful and as behavioural change is based on a complex interaction between cognitions, attitudes, and intentions, it is possible that further changes may occur over time. Importantly, few respondents reported that the messages impacted their enjoyment of play or that they were frustrated by messages. This is similar to previous studies of dynamic warning messages (Monaghan & Blaszczynski, 2010b) and suggests that these are an effective harm minimisation intervention as they facilitate responsible gambling, without overtly disturbing recreational gamblers. This is a very important finding given that research has found many warnings for alcohol and tobacco products can actually increase consumption among vulnerable groups (Ringold, 2002).

The results showed that messages which were accurately recalled had a greater chance of influencing players and/or that messages which had a greater influence were more likely to be recalled. However, the findings also demonstrated that accurate recall is not necessary for message impact. A sub-section of respondents reported that the messages made them think about the amount of time and money they spend on the machines. This is a particularly important finding as it indicates that messages do not have to be accurately recalled, or considered impactful to influence players' thoughts and behaviours.

The themes of the most commonly recalled messages related to spending more money than is affordable, setting and playing within limits, and taking/needing a break. However, the diversity of views among respondents indicated that including a range of messages as harm minimisation interventions may be useful to increase the likelihood that they will be effective across a heterogeneous consumer group. Notably, the only message including the word 'money' was not well recalled, indicating that words such as 'spend', 'spent', and 'afford' resonate with players to a greater extent. Messages which had two components were among the best recognised messages. However, few players accurately recalled the entire message. Furthermore, although they resulted in good recall, this did not necessarily mean that they were impactful.

As this is the first in situ trial of dynamic warning messages and it was conducted in commercial gambling venues there were a number of constraints on the elements that could be manipulated. In situ trials

are subject to some bias, such as the self-selection of respondents who agree to participate. Due to limited functionality of the EGM QCOM protocol, message delivery, design and functionality could not be manipulated past the capability of the existing QCOM protocol. This meant that the format of the messages (e.g., colour, font, and size) could not be manipulated or tested. When asked to rate each of the eight messages in terms of how impactful they were, the messages were not presented in randomised orders. Thus, the impactful nature of Message A may simply be a primacy effect, however, the second most impactful message reported by respondents was message D, while message B had similar reported impact to message H, which suggests that priming may not have affected results. The constraints of the research and nature of the venues and population included should be considered when considering the extent to which the results can be generalised. Replication of this study would provide further insight into the extent to which the findings can be applied to other populations and jurisdictions. Due to the available time to complete this research, message impact could only be assessed in the short term. Future research should assess the longer term impacts of dynamic warning messages on consumers' gambling behaviour. This is recommended as behavioural change typically occurs over longer time periods than could be measured in this project. Future research should consider the most appropriate timing of messages, the impact of font size and colour, and the use of graphics, all of which have been suggested to moderate the effectiveness of warnings (Argo & Main, 2004; Cox et al., 1997).

The benefit of an in situ trial is that it has high ecological validity as respondents were exposed to messages in a real gambling environment, which increases the authenticity of their responses to the messages and their impact (Mayer & Scammon, 1992). The use of both self-appraisal and informative messages was supported by the results as an effective harm minimisation intervention. It is possible that various messages appeal to different audiences so a combination of messages should be used to optimise effective communication with consumers. Rotating messages with various wording appears to be an effective way to communicate responsible gambling messages. This is consistent with survey data from Canada, the UK, and Australia indicating that health warnings have their greatest impact shortly after implementation and decline in effectiveness over repeated exposure (Hammond, 2011). Importantly for businesses, research suggests that consumers find businesses more socially responsible when they use effective warnings for products (Torres, Sierra, & Heiser, 2007). It has been argued that good corporate policy should be to implement effective product warnings and take a proactive role in helping to create effective warnings that go beyond regulatory compliance (Mayer & Scammon, 1992). Taking a proactive approach and optimising warning messages allows corporations to uphold their duty to consumers and reduce consumers using their products in risky ways, thus reducing related harms. Therefore, offering effective warning messages may increase consumer confidence and brand loyalty as well as reducing risks and minimising harms.

The implications of this research extend beyond the provision of dynamic warning messages for EGMs. Internet gambling has been recognised as a significant public health concern as the widespread use of Internet-enabled devices, including computers, tablets, and smart phones, means that gambling is easily accessible at almost any time and any place (Cotte & Latour, 2009). As compulsive gambling is highly comorbid with compulsive alcohol and tobacco use (Hodgins et al., 2011; Potenza, 2014) warning messages that are effective among this consumer group may be similarly effective for other risky consumer products. Research should consider the applicability of self-appraisal messages for problem alcohol use and smoking in an effort to impact behavioural change and informed decision making among consumers. Marketing cues based on consumer behavioural theory can serve as the first line of defence in the prevention of harmful behaviours through the use of salient and effective warnings that interrupt continuous and excessive consumption (Martin et al., 2013). Policy makers should work with marketing experts to develop approaches

that ensure that consumers restrain their consumption of potentially harmful products to within appropriate levels. Understanding the most efficacious messages for warning messages is a critical research area to create and implement marking cues that impede consumer's movement towards addiction.

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