

## On the Feasibility of In-Venue Observations of Electronic Gaming Machine Gamblers and Game Characteristics

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### Abstract

Detailed observational studies of undisturbed gambler behaviour in venues are rare, especially when the focus is on continuous gambling such as electronic gaming machines (EGMs). EGMs are the main source of harmful gambling in New Zealand and all EGMs in New Zealand now include a mandatory pop-up message feature. The present study reports on 48 hours of in situ observations of EGM gamblers in casino and non-casino (pub) venues in New Zealand. We sought to establish whether relatively detailed observations of EGM features and gambler behaviour in venues were possible. The EGM feature that we focused on were pop-up messages, given their harm-minimization potential and the relative ease with which they can be observed. However, other EGM features were also documented, along with descriptive accounts of associated gambler behaviour. The results establish that relatively detailed (quantitative or qualitative) observational data can be collected in venues by using smart phones. The data showed that pop-up messages were generally attended to, but had little observable effect on gambler behaviour in venues. Direct in situ observation of gamblers can provide ecologically valid information to complement more common experimental and survey-based approaches. Suggestions are made for developing the procedure.

**Keywords:** Gambling, electronic gaming machines, game characteristic, observation

### Résumé

Les études d'observation détaillée *in situ* sur le comportement non perturbé de joueurs sont rares, surtout si on met l'accent sur le jeu continu, comme avec les appareils de jeux électroniques. En Nouvelle-Zélande, ces appareils sont la principale

source de jeux compulsifs, et tous les appareils dans ce pays incluent dorénavant une fonctionnalité obligatoire de message contextuel. La présente étude fait état de 48 heures d'observation *in situ* de joueurs sur appareils dans des casinos ou d'autres lieux (bars) en Nouvelle-Zélande, et on a cherché à déterminer s'il était possible de faire des observations relativement détaillées des caractéristiques et du comportement de joueurs dans ces lieux. On a mis l'accent sur la fonctionnalité des messages contextuels pour analyser leur potentiel de diminuer des méfaits et leur relative facilité à les observer. On a aussi consigné d'autres fonctionnalités d'appareils de jeu, ainsi que des comptes-rendus descriptifs du comportement des joueurs associés. Les résultats montrent que l'on peut recueillir des données d'observation *in situ* relativement détaillées (quantitatives ou qualitatives) à l'aide de téléphones intelligents. Les données montrent que les messages contextuels ont généralement été pris en compte, mais qu'ils ont eu peu d'effet observable sur le comportement des joueurs. L'observation directe de joueurs peut fournir des informations écologiquement valables pour appuyer les approches expérimentales communes par sondage. On y fait aussi quelques suggestions pour mettre en œuvre une procédure.

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## Introduction

Reports of in-venue observations of gamblers are rare but varied in their approach (e.g., Aasved & Schaefer, 1995; Browne, Langham, Rockloff, Li, Donaldson, & Goodwin, 2015; Delfabbro, Osborn, Neville, Skelt, & McMillen, 2007; Fisher, 1993; Fong, Law, & Lam, 2014; Fong, So, & Law, 2016; Griffiths, 1991, 2011; Parke & Griffiths, 2004). These variations occurred in the broad methodology used (in the simplest sense quantitative and qualitative), which depended on the gambling activity of interest and the type of venue in question.

Certain forms of gambling lend themselves to relatively detailed reports of individual gambler behaviour because of the relatively slow-paced and easily observable trial-by-trial outcomes. For example, Aasved and Schaefer (1995) shadowed pull-tab players (pull-tab being a ticket-based analogue of electronic gaming machines [EGMs] in which combinations of symbols win prizes) in Minnesota, United States, and reported on the fundamental aspects of the activity, as well as the more detailed data on patterns of gambling in individual gamblers. The individual tickets inherent in that game made it suitable for detailed yet unobtrusive recording of betting patterns and game outcomes (see also Fong et al., 2014, 2016, for related detailed recordings in a Macau casino of the game outcomes of Cussec, a chance-based game in which gamblers bet on the outcomes of three dice being rolled).

Fast-paced continuous forms of gambling such as EGMs present substantial challenges in making detailed observations linked to specific game characteristics. However, such observations are potentially important, given the established links

between EGM gambling and harm (e.g., Dowling, Smith, & Thomas, 2005). In New Zealand, a large majority of people seeking professional help for their gambling problems cite EGMs as the primary or only source of harmful gambling (Ministry of Health, 2016). Moreover, in a nationally representative study of gamblers who had gambled on non-casino (pub) EGMs in the past year, 2.7% were problem gamblers (2.5% for casino-based EGMs) and 8.7% were moderate-risk gamblers (9.1% for casino-based EGMs; Abbott, Bellringer, Garrett, & Mundy-McPherson, 2014). In contrast, among the entire New Zealand population, 0.7% were problem gamblers and 1.8% were moderate-risk gamblers (Abbott et al., 2014). Behavioural tracking data can address some questions, but are not available in all jurisdictions, notably New Zealand, where no widespread tracking system is available. Thus, direct observation is potentially useful in the absence of electronic data; even with the presence of electronic data, detailed observations could provide contextualized information on gambler behaviour.

Beyond electronic monitoring of EGMs, detailed spin-by-spin accounts of EGM gambler behaviour would be inherently difficult to record, given the speed and complexity of EGM events, even more so should the observers' goal be to record undisturbed gambler behaviour. Nonetheless, a small number of studies that focused on EGM gamblers in venues have been published. Some have involved qualitative (or mixed methods) reports of large numbers of gamblers in many venues, the general aim being to understand the context of behaviour in those venues and/or to describe the general characteristics of behaviour in venues (e.g., Fisher, 1993; Griffiths, 1991, 2011; Parke & Griffiths, 2004). These studies have therefore not involved close observation of the behaviour of individual gamblers in response to specific EGM events. For example, Griffiths (2011) reported an observational study in which he focused on three behavioural variables (ability, control, and time spent gambling) during more than 1,000 hours of observations across a variety of venues. His goal was to identify and describe typologies of EGM gamblers. From the observations of these three behavioural variables, Griffiths (2011) reported six types of gamblers in U.K. venues: the dedicated professional, the dedicated impulsivist, the dedicated amateur, the part-time professional, the part-time impulsivist, and the casual amateur. Fisher (1993) reported similar work in an earlier observational study of adolescent gamblers in a single venue. Studies of this nature do not focus on individual EGM events and related gambler behaviour.

Other researchers have been unconcerned with reporting undisturbed gambler behaviour. Browne et al. (2015) reported a shadowing study on the effects of jackpots on EGM gamblers, who were recruited in venues and observed with their full knowledge. Gamblers were asked to behave as they intended to prior to enrolling in the study and encouraged to "play for as long or as little as they liked, and to move to different machines or take breaks as they normally would" (p. 6). Because all participants received these instructions, the authors argued that participants were equally affected. However, the nature of these effects was not quantifiable. Browne et al.'s (2015) intensive supplementary data collection and well-designed study meant

they were able to establish relationships between EGM jackpots and gambler behaviour, albeit with the caveat that the behaviour was affected by the observation itself.

The observational approach taken in the present research most closely resembles that reported in the study by Delfabbro et al. (2007) in which they aimed to identify problem gamblers in venues in Victoria, Australia. These researchers used an unstructured observational approach to describe the in situ behaviour of gamblers. Observers entered venues as patrons and observed gamblers without disturbing any ongoing behaviour. Only on exiting the venue did observers make notes on their observations (supplemented by any minimal notes they could make in the venue). From the perspective of their goal, the researchers were able to confirm that many of the proposed signs of problem gambling were observable. In addition, they showed that it was possible for observers to enter venues undetected and make undisturbed observations of gamblers, often from the bar or a table in the bar. As with all observational data, there were limitations, in this case, the retrospective nature of the recordings, as observers made their notes on exiting the venues.

Delfabbro et al.'s (2007) approach provided retrospective descriptive accounts of gambler behaviour, but it was not designed to examine the link between specific EGM events and gambler behaviour. In New Zealand, non-casino venues typically have gaming areas that are separate from the main bar, so that sitting at the bar or a table and observing was not possible in our study; more detailed observations required being closer to the observed gambler than was needed in Delfabbro et al.'s (2007) study. To collect this level of detail, observers had to appear to be normal gamblers, and we determined that notes could be made at relatively frequent intervals by using smartphone technology. The frequency of spins and small wins, however, meant that accurate counts of their occurrence and the behaviours associated with them would not be feasible. Moreover, many such credit gains would likely be losses disguised as wins in which the gambler "won" credit amounts that were smaller than the number of credits wagered on the spin. Thus, although we made descriptive accounts of spins and small wins, the focus was on documenting and recording all of the less frequently occurring events and their associated behaviours, in particular the pop-up messages.

Since October 1, 2005, all new EGMs in New Zealand have had to include a mandatory pop-up message feature, and by July 1, 2009, every EGM in every venue had to include this feature. The pop-up messages interrupt gambling at irregular intervals not exceeding 30 min of continuous gambling, rendering the EGM non-operational for at least 15 s and presenting the gambler with information on their current gambling session (including time at the EGM and their current losses/wins). After 15 s, the gambler is given the option of continuing to gamble or cashing out. Although empirical evidence on the effectiveness of pop-up messages and the sophistication of the messages themselves has developed since their introduction (e.g., Blaszczyński, Gainsbury, & Karlov, 2014; Monaghan, 2008; Monaghan & Blaszczyński, 2010; Wohl, Gainsbury, Stewart, & Sztainert, 2013), the early uptake of this system in New Zealand means the intervention itself was informed by just two studies (Ladouceur & Sévigny, 2003; Shellink & Shrans, 2002). The frequency of

occurrence of pop-up messages lent confidence that all occurrences regarding observed gamblers could be documented. Other relatively infrequent features, such as jackpots, free spins, and bonus features, were also recorded, as were general descriptions of behaviours linked to small wins and losses disguised as wins.

Thus, the present study served two main purposes. First, we aimed to ascertain whether relatively detailed in-venue observations could be undertaken without detection by patrons and whether we could establish the utility of such data. Second, given the New Zealand environment in which pop-up messages are compulsory on all EGMs, we focused on documenting behaviours observed in the context of the occurrence of these messages to contribute to the growing understanding of their impact on gambler behaviour.

### **Method**

Two researchers each made observations for 12 hr in both casino and non-casino venues, for a total of 48 hr of observation (24 hr in each venue type). The observations were spread across two casino and three non-casino venues. The fundamental premises for the study were twofold: (1) Observations must consist of undisturbed gambler behaviour, and (2) privacy and respect for the gamblers and venue staff was of paramount importance. The study aimed to have no impact on the ongoing leisure and work activity of those in gambling venues.

For safety reasons, researchers entered venues in pairs and participated in gambling activities posing as regular patrons and engaging in venue-appropriate behaviours while each observing different gamblers. They seated themselves at an EGM (the popular 1- or 2-cent machines in casinos and the 2-cent machines in non-casino venues) that afforded a clear view of other similar EGMs, and they gambled minimum bets on a single line at a slow pace (a slow “mini-mini” approach). Observations were recorded at a minimum of every 15 min (on average, observations were made every 5 min) for as long as a gambler could reasonably be observed (i.e., until the gambler left the gambling area or could no longer be unobtrusively observed). Observations were noted in the venue on a smart phone email application, which outwardly appeared to be normal patron behaviour (texting, checking email, Internet browsing). Industry advisors suggested behaviour of this nature would not seem out of place.

Observation sessions were conducted at different times each day (including mornings from 10:00 a.m. to 12:00 noon, lunchtimes from 12:00 noon to 2:00 p.m., afternoons from 3:00 p.m. to 5:00 p.m., and evenings from 6:00 p.m. to 8:00 p.m. and from 9:00 p.m. to 12:00 midnight) in both casino and non-casino venues. The researchers did not announce themselves or their purpose to other patrons, staff, or venue management. However, venue security was aware that observations could be occurring. After the researchers arrived in the venue, they used a pragmatic approach to select the location from which observations would be made (i.e., field of view, number of observable EGMs) and the gamblers who would be observed (i.e., sometimes during an existing session in which credits in EGM could be noted; in other cases, sessions

would be observed from their beginning as the gambler occupied an observable EGM). Overall, the stated goal was to observe a diverse array of gamblers in venues, but beyond that, decisions were made by the researchers in venues as to the most appropriate locations and gamblers to observe.

The researchers were familiar with the main EGM features and pop-up messages and made descriptive notes of the occurrence of observable EGM features and behaviours that followed these messages. Behaviours suggested by gamblers and venue staff to be specifically associated with pop-up messages were a focus of the researchers (e.g., changing EGMs; redundant button pushing; cashing out either intentionally or unintentionally; texting or using a phone; a bathroom, cigarette, or drink break; watching others or looking away from their EGM; and summoning of venue staff; see also Landon, Palmer du Preez, Bellringer, Page, & Abbott, 2016). However, the protocol also stressed the description of any observable or audible behaviours.

Throughout the study, the researchers were never approached by venue staff or other patrons to question their activities. The only interaction with other patrons beyond a casual greeting was that on a few occasions, gamblers offered advice on how to gamble more effectively by wagering on more lines. Because minimal interactions occurred with patrons, the researchers estimated their age; ethnicities were not reported.

The data were entered into NVivo version 10 (QSR International, 2013) and coded for descriptive quantitative (identifying and counting behaviours observed) and qualitative (describing patterns of play in the context of EGM game characteristics, including pop-up messages) analysis. For presentation purposes, credit wins were coded for their size on the basis of credits won: Wins of up to 100 credits (on a 1-cent EGM up to \$1, on a 2-cent EGM up to \$2) were coded as small wins, wins between 100 and 400 credits (\$1 and \$4, or \$2 and \$8 on 1- and 2-cent EGMs, respectively) were coded as medium wins, and wins of more than 400 credits were coded as large wins. The counts of specific events were supplemented with qualitative descriptions from the observer's notes.

This research was approved by the authors' institutional ethics committee (Approval number 11/302).

## **Results**

Table 1 shows the gender and estimated age of the observed gamblers. The proportion of female gamblers observed in casinos was higher than in non-casino venues. The times at which observations were made were unrelated to the estimated age and gender distributions of observed gamblers, and there were no discernible differences in the qualitative notes of gambler behaviours.

In casinos, 66 gamblers were observed. These observations were between 15 and 90 min each, the median observation length being 30 min. In non-casino venues,

57 gamblers were observed, the median length again being 30 min, and the observations ranged between 15 and 135 min. No differences were evident in observation time related to gender or estimated age.

Table 2 shows the recorded observations of key EGM features in each venue type. The high frequency of small wins meant it was impossible to document all occurrences in this category, together with associated behavioural responses. Thus, the numbers of small and medium wins are substantially under-represented in these data, but qualitative descriptions of behaviours following their occurrence were collected. In addition, the pace of gambling and the frequent cashing out and/or reinserting of smaller amounts of money made it difficult to accurately track gambler expenditure.

Table 2 also shows that pop-up messages occurred relatively infrequently compared with the readily observable free spins and large credit wins and in the context of an almost constant stream of small and medium credit wins, all of which occurred with accompanying win-related lights and sounds.

The majority of gamblers in both types of venues gambled on a single EGM and in the same game on that EGM during the periods in which they were observed.

Table 1  
*Estimated Demographic Characteristics of Observed Gamblers*

Age (years)	Casino gamblers			Non-casino gamblers		
	Male	Female	Total	Male	Female	Total
20–29	5	5	10	7	3	10
30–39	0	9	9	4	6	10
40–49	7	7	14	6	4	10
50–59	1	6	7	4	5	9
60+	6	20	26	12	6	18
Total	19	47	66	33	24	57

Table 2  
*Documented Observations of EGM Features in Casino and Non-Casino Venues*

EGM feature	Casino instances	Non-casino instances
Jackpot win	0 <sup>a</sup>	0 <sup>a</sup>
Pop-up message	22	18
Free spin win	70	66
Large credit win (400+ credits)	66	76
Medium credit win (100-400 credits) <sup>b</sup>	35	42
Small credit win (1-100 credits) <sup>b</sup>	76	80

*Note.* EGM = electronic gaming machine.

<sup>a</sup>Three minor jackpot wins (\$50-\$200) were observed: two in casinos and one in a non-casino venue.

<sup>b</sup>These categories are substantially underestimated due to the pace of play and data collection method.

In casinos, 82% (54 of 66) of observed gamblers gambled on only one EGM during the observational period, and 86% (57 of 66) used only one of the games available on that EGM. These percentages were slightly lower among gamblers observed in non-casino venues, with 72% (41 of 57) of gamblers not changing EGMs and 61% (35 of 57) using only one of the available games. When a gambler was observed switching EGMs or games on an EGM, the majority of switches occurred during periods without wins (72%), and most of the remaining switches occurred immediately after a larger win of 400 credits or more (26%).

Although the main focus was on the occurrence of pop-up messages, behaviours in relation to other key features were also documented. The qualitative notes highlight the potential usefulness of this approach in contextualizing gambler behaviour in response to key EGM features. Overall, an invariance was notable in gambler behaviour in response to small wins (or losses disguised as wins) and other frequently occurring features: Gamblers generally continued gambling in the same manner after these events. On the basis of these data, two features of particular interest are free spins and jackpots (or, more specifically, advertised jackpots nearing their limits). Free spins have been noted elsewhere as a key EGM feature (e.g., Blaszczynski, Sharpe, & Walker, 2001; Harrigan & Dixon, 2009; Harrigan, Dixon, & Brown, 2015; Livingstone, Woolley, Zazryn, Bakacs, & Shami, 2008), and descriptive accounts of gambler behaviours here support that conclusion, with gambler behaviour commonly suggesting enjoyment and/or relief at winning free spins.

Laughs with gambler next to her. Wins free spins, smiles, points to symbols she wants while games play. Wins \$10. Plays on... Gambler calls over to her from four machines away: "Got free spin put it up a bit higher [wager] and got it again!" "Tin bum" another calls out. All laugh. (Female gambler, 60+ years, casino)

Wins 20 free spins, turns, and says to no one in particular, "Thank god, that took forever!" Watches older lady next to her play, while her free spins roll, looks back at end of free spins to see last couple of spins and result. (Female, 40s, casino)

Despite no major jackpot being won, the possibility of winning one was evident in the discussions among gamblers in non-casino venues. In each non-casino venue, only one jackpot was available, and there were frequent discussions among gamblers, especially when jackpots were nearing their limits and perceived as due to pay out.

"Are you keeping track on that? [indicating jackpot amount] We need to stay in for the jackpot—it's up over 940 [dollars] tonight." (Female, 50s, non-casino)

In non-casino venues, the discussions and behaviour also often had a social or collegial element. Knowledge of the jackpot nearing its designated limit was shared with patrons in the bar, and it was common for bar patrons to visit the gaming area two or three times during their visit to the bar and to insert \$20 into an EGM and wager the minimum amount on the maximum number of lines until no credits remained. This resulted in a gambling session of 15-30 min and was discussed as

making sure one is “in to win” the jackpot. Gamblers also shared their thoughts on how to win the jackpot with each other.

[Observed gambler to gambler next to him] “Money bags is the right game to win it.” He then chooses money bags game option. (Male, 20s, non-casino)

Different behaviours were evident in casinos where rows of EGMs were linked to the same jackpot. One approach that was observed as jackpots neared their limit was for gamblers to insert a small amount (often \$2) into one EGM and gamble one credit on the maximum lines until the credits reached zero. They would then move to each successive linked EGM and repeat this process until they had no coins remaining. Another strategy was group oriented, with a social group taking up an entire row of EGMs and each gambler gambling one credit per spin, usually on just one or two lines. This allowed them to gamble slowly over a long period and to prevent others from using the EGMs linked to the jackpot. The groups were very sociable among themselves, talking and laughing, and one member would purchase food and drinks for the group to share.

Pop-up messages were documented fewer times than other EGM features, with the exception of jackpot wins (Table 2). Given their nature (i.e., the EGM screen is locked and unplayable), every pop-up message that occurred in the observation period was likely to have been documented; these data highlight the quantitative potential of this approach. Forty pop-up message occurrences (22 in casinos, 18 in non-casinos) were documented from 29 gamblers (18 in casinos, 11 in non-casinos). Most gamblers whose gambling was interrupted by a pop-up message had this occur only once during the period of observation. However, in casinos, two gamblers were each observed receiving two pop-up messages, and one received three pop-up messages. In non-casino venues, this was similar, with two gamblers each receiving two pop-up messages, one receiving three, and one receiving four. Thus, these gamblers had gambled between 1 and 2 hrs continuously.

Table 3 shows the behaviours observed while the pop-up message was displayed. Two behaviours were predominant: in 15 of 40 cases, the gamblers seemed to attend to and read the information on the screen, and in 16 of 40 cases, the gamblers looked

Table 3  
*Behaviours Observed While Pop-up Messages Occurred by Setting*

Behaviour	Non-casino instances, <i>n</i> (%)	Casino instances, <i>n</i> (%)
Appears to read the information	10 (56%)	5 (23%)
Watches other gamblers and their machines	6 (33%)	10 (45%)
Shows frustration	2 (11%)	2 (9%)
Removes loyalty card	0	2 (9%)
Checks cell phone	0	2 (9%)
Leaves EGM momentarily while pop-up occurs	0	1 (5%)

*Note.* EGM = electronic gaming machine.

Table 4  
*Behaviours Observed Following Pop-up Messages by Setting*

Behaviour	Non-casino instances, <i>n</i> (%)	Casino instances, <i>n</i> (%)
Continues playing at same rate (credits/lines bet)	9 (50%)	12 (54%)
Increases credits bet	3 (17%)	2 (8%)
Cashes out	2 (11%)	2 (8%)
Changes machines or games	2 (11%)	1 (4%)
Inserts money into machine	1 (6%)	2 (8%)
Increases speed of play (spin button pushing)	1 (6%)	2 (8%)
Decreases speed of play (spin button pushing)	0	2 (8%)
Accesses player information display screen	0	1 (4%)

away, watching other gamblers and their EGMs. In this small data set, it seems that gamblers in non-casino venues were more likely to read the information on the screen. There were few signs of frustration (4 of 40 cases); in two cases, gamblers were observed hitting the spin button while the EGM was inoperable, and in two other cases, verbalizations were noted, indicating frustration at possibly missing out on a jackpot.

[Pop-up message appears] Looks around, says to lady next to her: “Waste of time this. Every time I want to play for the jackpot, it blocks it!” (Female, 60+, non-casino)

Data collected allowed for a descriptive account of the observable effects of pop-up messages on gambler behaviour. Table 4 shows the counts of behaviours observed following pop-up messages in both venue types. Judgements on changes in the rate or intensity of gambling were based on observations of wager amount and number of lines played. The dominant observed response, as with other EGM features, was a continuation of gambling at the same rate. About half of all pop-up messages resulted in gamblers either waiting or pressing the “continue gambling” response when it became available, and then gambling in the same manner as they were prior to the pop-up message. A range of other behaviours was noted, with a small number of pop-up messages being followed by increased or reduced gambling intensity and, similarly, a small number of instances of gamblers cashing out or changing games or EGMs.

## Discussion

The present research was designed to observe in situ gambler behaviour in response to pop-up messages and other key EGM features in casino and non-casino (pub) venues in New Zealand by using a novel approach informed by previous research (Aasved & Schaefer, 1995; Browne et al., 2015; Delfabbro et al., 2007; Fisher, 1993; Griffiths, 1991, 2011; Parke & Griffiths, 2004). Pop-up messages were observed relatively frequently, along with other EGM features, and descriptions of the behaviours occurring with them were recorded. The results showed that ecologically valid and relatively detailed data can be collected on EGM gambler behaviour in

venues. Neither venue staff nor patrons raised any concerns about the researchers' behaviour. This lack of detection confirms the feasibility of this approach in a practical sense, thus demonstrating in principle that this simple approach to data collection could prove valuable for further direct observation studies in venues.

Given the New Zealand gambling environment in which pop-up messages are mandatory on all EGMs, observations of gamblers' reactions to them were of particular interest. Forty instances were observed, and given the nature of the feature, these were gamblers who had been gambling for extended periods. The predominant behaviours were attending to the information on the screen or watching other gamblers. Attending to the information was more common in non-casino venues in this study; however, further investigation is required to ascertain whether this is a meaningful difference between behaviours across venue types. The non-casino (pub) gaming areas tended to be separated from the drinking and more social areas, as the gaming areas were largely enclosed spaces without music or bright lighting where solitary gambling is the norm, with each gambler focused on his or her own screen; in contrast, the casino gaming floor was a more open space. Although it is possible that there are different behavioural norms across venues, the researchers were actively watching other gamblers in both environments and their behaviour was not identified as abnormal or problematic. Perhaps of more interest are the reasons for gamblers not attending to the on-screen information—these could be gamblers who have habituated to the messages or suffered more harm. Monitoring EGMs for pop-up messages is relatively straightforward (even from a distance, pop-up messages are easily discernible given their size and central presentation and because the EGM is inoperable at the time), and if relatively subtle gambler responses are indicative of harmful gambling, this is certainly useful information for host responsibility practice.

The data also suggest that following the pop-up message, most gamblers tended to resume gambling at the same rate. An important observation, given the views sometimes expressed by gamblers and venue staff (Landon et al., 2016), is that there was minimal evidence of annoyance or frustration among gamblers. In the few instances where this occurred, it seemed that it was due to the timing of a pop-up message coinciding with the perception that a jackpot was likely to pay out. This observation is consistent with the notion that there is no substantial impact of the pop-up messages on gambler enjoyment (Palmer du Preez, Landon, Bellringer, Garrett, & Abbott, 2016). Nonetheless, irrespective of the context, where frustration in response to pop-up messages was evident, it could be an indication of likely harmful gambling and an opportunity for venue staff to interact with patrons as part of host responsibility.

Evidence supporting variations of pop-up messages as effective harm-minimization tools has developed since the design of the New Zealand intervention (e.g., Blaszczynski et al., 2014; Monaghan, 2008; Monaghan & Blaszczynski, 2010; Wohl et al., 2013), but regardless of their sophistication, these messages indicate a gambler who has been gambling for an extended time, and those who report typically seeing

three or more pop-up messages in a gambling session are more likely to be problem gamblers (Palmer du Preez et al., 2016). The pop-up messages provide an opportunity for vigilant venue staff to interact with patrons, and it would seem logical to suggest that pop-up messages would be more effective if supplemented consistently with staff intervention (e.g., Delfabbro et al., 2007; Department of Internal Affairs, 2013; Griffiths, 2009; Productivity Commission, 2010; Tse et al., 2005). Unfortunately, no evidence of venue staff interacting with patrons at an EGM was evident in the present study.

Our study establishes that detailed in-venue observations of gamblers are possible by using readily available smart phones to collect data. Descriptive accounts of behaviour were combined with counts of specific events to highlight the possibilities of an expanded version of this approach. In future iterations, either approach could be used alone, depending on the purpose of the research. There was no evidence to suggest that gambler behaviour was affected in any way: Researchers were never approached by venue staff nor by other gamblers questioning their presence. The only interactions with gamblers were similar to those observed among other gamblers, or when gamblers noted the novice “mini-mini” gambling pattern of the researchers and provided advice on how to win by wagering on more lines on the EGM.

This approach can easily be replicated to focus on specific aspects of gambling products, or on social or contextual aspects of gambling environments. A key gap remains in these in situ observations of gambler behaviour in response to EGM characteristics, which is only partially addressed in the present study. Given that the feasibility of this approach has been established, larger studies could include more extensive periods of observation, confirm inter-rater reliability, and perhaps collect sufficient data to undertake quantitative analyses to more rigorously assess the differences suggested by the present data. With sufficient data, it may be possible to quantitatively assess the effects that features such as pop-up messages have on behaviour, or to determine whether specific EGM features are associated with increased gambling intensity in venues. Regarding EGMs, this could be done by simply selecting control periods of gambling separated by periods that mirror the frequency of pop-up messages, or by selecting specific EGM events unrelated to pop-up messages to serve as control events. With sufficient data, this approach could be broadened to a range of features.

While the method has many uses, it is not without limitations. As noted, EGM events occur at a pace at which manual recording of every event and every response is simply not possible. If access to electronic monitoring of data is possible, these limitations can be overcome to an extent. However, if the aim is to document peripheral (non-EGM recorded) behaviours in a given context, as it was here, electronic monitoring cannot address that. Thus, it seems more beneficial to focus on specific EGM events and to collect more data on them (as outlined here with pop-up messages). At this stage, it is not clear what the maximum event-recording frequency is with this approach. Observations every 5 min seem possible, but detection of the

observer would become more likely because the behaviour would be very patterned and more easily discriminable from that of regular patrons. Moreover, collecting detailed descriptive data on the spot means that other relevant information could be missed. This can be minimized to a degree by having a clear focus through a detailed checklist with pre-coded behaviours known to be associated with the EGM feature and by recording data, as far as possible, as the behaviours occur. Gathering data in multiple forms to understand gambler-EGM interactions and interactions occurring in the gambling environment in response to EGM events remains important, and in situ observations of undisturbed gambler behaviour in venues is a potentially important component. Ecologically valid studies can complement well-controlled experimental studies and retrospective surveys to add to the understanding of gambling and problem gambling on EGMs.

The present research illustrates the utility of a covert observational approach to document in-venue behaviours as they occur. Detailed in situ observations are clearly possible, and this approach could be used in a variety of gambling environments in which direct observational data would be useful to supplement current knowledge. The pop-up message feature, a key harm-minimization intervention in New Zealand, had few observable impacts on behaviour in venues. The messages were often attended to, but did not noticeably annoy gamblers. Although the variations in response to the pop-up messages require some clarification, it is clear that automated interventions of this nature provide an opportunity for venue staff interaction to support harm-minimization efforts.

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