



Future-Proofing the Industry: Towards the safer design and situation of games

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EXECUTIVE SUMMARY

CONTEXT.

Gambling is increasingly being examined by its relationship to public health. Restricting how gambling is supplied (e.g. design of games, availability) is one of two main ways in which potential risks to public health can be managed. The other is through providing highly effective safeguards surrounding these games. Such safeguards should provide comprehensive and accurate information permitting consumers to make informed decisions. They should also include more targeted and restrictive options for intervention that may be triggered by players themselves or by operators following indications of player harm. Attention being paid to the first of these two options (i.e. regulating the design and situation of gambling) is increasing and this may reflect a lack of progress in the latter option of providing highly effective safeguards.

AIMS AND SCOPE.



This discussion paper provides an overview of existing knowledge on a selection of issues related to the safer design and situation of gambling games (two components of the supply-led approach). Its purpose is to stimulate discussion at the British Columbia Lottery Corporation's (BCLC) forthcoming 2020 New Horizons in Responsible Gambling conference, entitled "Future-proofing the Gambling Industry". It highlights what we know, what we do not know, and proposes key challenges and discussion points to support conference engagement and dialogue. Specific topics covered in this paper include the following areas: the speed and continuity of play; near wins; losses-disguised-as-wins and volatility; choice architecture; and the number and placement of gaming machines in venues.

SPEED AND CONTINUITY.



While there is still much to learn about how fast, continuous games contribute to harmful gambling, there is currently a strong case that rapid, repetitive gambling opportunities pose greater risks of harm to players. Risks posed may be multidimensional in nature, manifesting in the form of higher costs of play, threats to self-control and decision-making, often driven by needs for excitement and mood modification. However, there is still much we do not know. For example, just how fast and continuous does play need to be to be risky? Will slowing play make games less enjoyable? Should we even care if games are less enjoyable?

NEAR WINS.



Near wins may drive engagement through their potential to create excitement, frustration or modify mood. Consequently, near wins may contribute to both the inherent risks, and the inherent appeal, of a game. The near win is perhaps the most researched structural characteristic in gambling studies. However, despite this attention, existing evidence regarding its potential for harm remains inconsistent and underdeveloped. The lack of supporting research may, in part, reflect the constraints found in laboratory settings to replicate realistic gambling conditions, particularly those that may be most conducive to harm. At this time, deficiencies in evidence may be better explained by the challenges in researching the near win rather than by assuming an absence of any harmful impact. But should modifying near wins be at the top of the list when deciding how to make games safer?

LOSSES-DISGUISED-AS-WINS (LDWS) AND VOLATILITY.



Games offering a reasonable probability to recover unaffordable expenditure, combined with the emotional ups and downs that come from unpredictable, high reward games, and the erroneous belief that losing brings you closer to success may be a risky blend. However, similar concern has also been expressed for games providing more frequent, consistent



smaller wins (including LDWs). While some laboratory research validates concern, various research design constraints limit generalising these findings to real, more harmful gambling. One potential explanation for this apparent contradiction may be that vulnerability to game volatility varies depending on experience (e.g. small frequent wins may encourage more engagement for the less initiated).

CHOICE ARCHITECTURE.



Sometimes during intensive gambling experiences, it may be more difficult to think rationally and control urges (possibly because of induced excitement, stress or tiredness). For this reason, it is important that the situations in which gambling takes place protect, rather than exploit, these vulnerabilities. There are indications that exploitative choice architectures (i.e., 'dark nudges') are sometimes used by the gambling industry (e.g. defaults used to 'nudge up' deposit amounts or incentivising excessive engagement using gamification strategies). There is little evidence to suggest that these bring pleasure to players or that using more protective, safer choice architecture would reduce enjoyment or convenience. Where there is much uncertainty regarding how to prevent harm, is this an obvious area requiring immediate action?

NUMBER AND ARRANGEMENT OF MACHINES.



One of the questions sometimes raised regarding the design of gambling venues is how the number and arrangement of gambling machines might contribute to risky gambling behaviour. It is true that established techniques in environmental design used in the casino industry (e.g. increasing machine visibility) have been shown to increase game revenue. However, research also suggests that more vulnerable individuals may prefer more private locations on the gaming floor. Practical implications for making gambling safer in venues, by modifying the number and arrangement of gaming machines, seem less clear relative to other situational risk factors (e.g. access to additional funds).

FUTURE-PROOFING THE SAFER DESIGN AND SITUATION OF GAMES.

After over 50 years of research, we would ideally like to know more about the ways in which games, and how they are supplied, pose risks to consumers. It is argued that despite substantial gaps in knowledge, we know enough to accelerate progress in how to make games safer. This may require a dual approach: one half of the dual approach involves taking immediate action where we are reasonably confident that it is required and that it will be effective; the second half involves planning a long-term, collaborative and valid approach to research. Principles for generating knowledge need to be agreed between stakeholders to avoid potential bias and to ensure long-term buy-in of research outputs.



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1 INTRODUCTION

1.1 Aims

The aim of this document is to stimulate thinking and provoke discussion at the forthcoming 2020 BCLC New Horizons conference, entitled “Future-proofing the Gambling Industry”. It aims to provide a concise but authoritative overview of major theories and evidence relevant to the safer design and situation of gambling games. It provides highlights of what we know, and what we do not know, and proposes key challenges and discussion points that can be taken by delegates as a background for productive debate.

The key theme of the conference, ‘Future-proofing’, refers to the ambition for meaningful progress to be made in ensuring gambling becomes a safer, more enjoyable activity for those choosing to participate. It also encapsulates the ambition to prevent and eliminate harm to vulnerable individuals. The concept of future-proofing gambling applies not only to social and public health initiatives, but also to advancing commercial sustainability. Consistent with the public health approach to gambling [1] the term ‘future-proofing’ reflects the intention to distinguish acceptable from unacceptable risks in the supply, the regulation and also the consumption of gambling.

In provoking critical discussion, the intention is to identify both areas of common ground and points of contention between a range of stakeholders invested in safer gambling. BCLC has prioritised this on the grounds that such debate, particularly between groups with potentially divergent views, does not currently occur with the required frequency or depth of consideration.

There are a number of benefits to this kind of focussed critical discussion, including but not limited to:

- Helping shape policy priorities and highlighting opportunities for immediate action by identifying common ground;
- Developing a better understanding of points of contention in order to help identify needs for reaching greater consensus (e.g. do we need more evidence, or do we need to reach agreement on principles);
- Agreeing and assigning responsibilities to collaborations between stakeholders best-placed to make the greatest impact (e.g. operators, software providers, regulators, academics); and
- Assisting in the identification of priority areas for research, including identifying the most promising methodologies to provide relevant knowledge for application to advance safer gambling programmes.

1.2 Game design and situation as causes for concern

Gambling games have the potential to be high-risk commodities [2]. However, concern regarding the harm that may be posed to public health by the design and situation of games is not new. A Home Office research study commissioned in the United Kingdom in 1977 [3] identified both sets of risk factors as requiring urgent attention (see Figure 1).

Mitigating the risks posed by gambling commodities can be broadly categorised in two ways [4]:

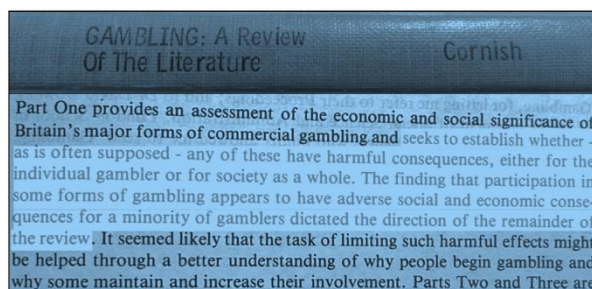


Figure 1. The search to better understand the impact of structural and situational characteristics on gambling harms has been active for nearly half a century.



1. Restricting or modifying how gambling is supplied focussing more on the structural, situational and environmental characteristics of gambling games (i.e. 'supply-led', 'upstream'); and
2. Implementing highly effective safeguards to help both consumers and operators keep gambling behaviour within the boundaries of healthy play (i.e. 'demand-led', 'downstream').

Downstream safeguards should provide comprehensive and accurate information permitting consumers to make informed decisions. They should also include more targeted and restrictive options for intervention, that may be triggered by players themselves, or where required by operators.

However, over the last decade, increasing focus is being given to how gambling can be better regulated 'upstream'. Growing pressure may reflect a lack of progress in providing highly effective safeguards 'downstream', a trend that has been observed in other areas of public health [5], [6].

1.3 Scope

This document focusses on a selection of key issues that are currently relevant to safer gambling in the context of game design and the situation of games including:

- Speed and continuity
- Near wins
- Losses disguised as wins and volatility
- Choice architecture
- Number and placement of gaming machines in venues

While guided by the principles of objectivity and balanced argument, this document is not intended to provide a comprehensive, critical review of all academic literature that may be relevant when considering issues likely to be of interest to BCLC conference delegates, nor does it cover the full list of relevant topics in relation to the design and situation of games.

This document is a discussion paper and is not a position paper. Safer game design is an emerging and evolving field; some areas remain contentious, and most research areas may as yet be underdeveloped. This paper is intended to offer insight into key debates in order to provoke further discussion, rather than to argue a particular position.

Although a brief definition of concepts is provided in each section, the document assumes an existing level of knowledge and understanding of key issues relating to the design and situation of games, the potential relationships to disordered gambling and otherwise harmful behaviour, and the challenges for industry and regulators in providing safer gambling.

Discussion questions have been included as suggestions under each topic area; there are likely to be many more which arise, and which are not articulated here. Delegates are encouraged to suggest their own discussion questions and bring them along to the conference.

2 THE DESIGN OF GAMES

For the purposes of this paper, the relevant design aspects of a gambling product are considered as comprising two components: the structural characteristics of the game itself (referred to here as the design of games) and its situational characteristics (referred to here as the situation of games). In this section, we consider the design of games by examining three structural characteristics (of which there are many): speed and continuity of play, the near win, and losses-disguised-as-wins (along with the concept of volatility).



2.1 Speed and continuity of play

2.1.1 What constitutes fast and continuous play?

Games permitting frequent opportunities to bet, and providing rapid feedback on betting outcomes, are more likely to result in faster, more continuous gambling behaviour. These criteria could apply to a sporting event with a relatively long event duration (e.g. three hours) offering frequent betting opportunities (e.g. through in-play wagering¹ and cash-out² functionality). In contrast, a weekly lottery draw, even though it may have a short event duration (e.g. one minute), would preclude fast, continuous play. This is because it has a low event frequency (i.e. feedback on the bet occurs only once a week). Importantly, the speed or frequency of an event may be less important in the maintenance of gambling behaviour than conditions permitting rapid, repeated betting thereon.

2.1.2 Understanding the impact of fast and continuous games

Research suggests that one or a combination of the following may render a gambling product more likely to cause harm as a result of being faster and/or more continuous:

1. Net expenditure increases because a greater number of bets can be placed over any given period of time [7]. It is important to note that the bet size, payback percentage³ and game volatility⁴ can also affect net expenditure. Assuming these other factors remain the same (e.g. when playing the same game), gambling at a faster rate (e.g. using 'turbo play'⁵ options) will increase net expenditure on average.
2. Fast, continuous play facilitates emotionally vulnerable individuals' psychological need for detachment [8], a need commonly associated with individual vulnerability to gambling problems [9], [10]. Need states may be further facilitated by fast, continuous games supported by automated (e.g. 'auto-play') and expedited ('turbo-play') betting options.
3. As above, gambling can be rewarding by creating pleasurable or exciting experiences (positive reinforcement) or by removing undesirable emotional states (negative reinforcement); rapid outcome delivery could strengthen either forms of reinforcement [11].
4. Extremely fast games (e.g. less than half a second) may prompt higher bet sizes among at-risk gamblers [12].
5. Faster, more continuous games can reduce the opportunity for reflection and fully engaged decision-making regarding the consequences of previous gambling and the likely effects of further gambling [7].
6. Product innovations such as in-play wagering and micro-betting, cash-out opportunities, and expansions in the number and variety of betting markets, now extend opportunities for faster, more continuous play to a greater number of gambling formats including sports (see Figure 2) [13]. For example, an Australian study found that 78% of those engaging in micro-betting were identified as problem gamblers compared with only 28% of those who did not [14].
7. Faster, more continuous, more available games provide a greater number of opportunities for vulnerable players to chase their losses and seek financial reparation [7].

"Continuous or frequent games are 'always there' when you need to use it as a means of escape or mood modification. This is not helpful IF the gambling is causing harm" [7].



¹ In-play wagering refers to bets placed during an event (e.g. a soccer game) including micro-betting on smaller related microevents (e.g. next goal-scorer).

² A cash out facility permits bets to be redeemed before their conclusion. The cash out value will depend upon the current likelihood of the bet winning – so it could be greater or less than the initial stake.

³ The average rate of return as prizes after accounting for the house edge over an extended period of time.

⁴ The frequency and variability with which money is won relative to money spent.

⁵ 'Turbo play' is an option available in some slot games to make reels spin faster.



8. Players are inclined to play faster following losing outcomes [15]. This suggests that losing outcomes within-session may further accelerate the rate of loss through faster play, or by prompting use of auto-play or turbo play features.
9. Finally, there may also be a strong, cyclical interplay among these risk factors. For example, losing money quickly (through fast, continuous play) may create negative emotional responses such as frustration or anxiety and further exacerbate the need for detachment or mood modification (better facilitated by rapid, repetitive opportunities to gamble) [7].

Date & Time	Stake (£)	Won (£)	Odds
September 4th 04:01:03	10	0	11.5
September 4th 04:01:42	15	0	3.6
September 4th 04:03:54	60	0	2.55
September 4th 04:08:49	20	0	3.65
September 4th 04:10:11	40	0	1.9
September 4th 04:11:36	15	63	4.2
September 4th 04:13:12	45	84.15	1.87
September 4th 04:13:41	40	0	1.7
September 4th 04:16:18	45	0	5.1
September 4th 04:17:13	40	70.4	1.76
September 4th 04:21:31	10	90	9
September 4th 04:29:25	25	75	3
September 4th 04:30:58	45	0	1.79
September 4th 04:34:45	30	112.5	3.75
September 4th 04:35:36	15	0	4.6
September 4th 04:37:18	30	0	4.4
September 4th 04:39:27	35	0	2.75
September 4th 04:42:38	15	0	5
September 4th 04:45:45	60	145.8	2.43
September 4th 04:47:06	40	0	3.4
September 4th 04:48:02	35	0	2.95
September 4th 04:54:38	15	0	7.5
September 4th 05:00:35	50	0	3.25
September 4th 05:08:09	60	117.6	1.96
September 4th 05:12:09	45	99	2.2
September 4th 05:13:06	50	95	1.9
September 4th 05:16:37	50	255	5.1
September 4th 05:25:52	43	81.7	1.9
September 4th 05:27:59	35	101.5	2.9
September 4th 05:31:51	50	92.5	1.85
September 4th 05:32:31	45	86.4	1.92
September 4th 05:34:58	55	0	2.85
September 4th 05:36:57	50	120	2.4
September 4th 05:37:31	15	0	5.25
September 4th 05:39:09	46	20.68	3.55
September 4th 05:44:29	35	0	3.35
September 4th 05:46:12	40	92	2.3
September 4th 05:47:17	35	0	3.5
September 4th 05:48:24	35	12.38	4.25
September 4th 05:56:09	15	0	3
September 4th 05:09:43	15	0	3.33

Figure 2. New structural features such as live betting, cash out, micro-event betting and instant depositing have the potential to increase the inherent risk of online sports betting by increasing the speed of play [13]. This figure is adopted from a study examining real online sports betting behaviour among problem gamblers [16]. It shows how multiple bets, feedback on outcomes and re-staking can now occur in quick succession – specifically, 41 individual sports bets within 69 minutes.

Given the role of fast and continuous play in producing excitement or removing negative emotional states, it is also likely to contribute to the overall appeal of the game. While its role in game appeal has been given limited attention in the academic literature, preliminary research suggests that games facilitating fast, continuous play are preferred by players [17]; however, precisely to what extent, and in under what conditions, remains unclear.

2.1.3 Challenges for the safer design of games

Relative to other aspects of game design, there is consistent, growing support that fast, continuous forms of gambling pose greater risks of harm to players. These potential risks may manifest through higher costs of play, threats to self-control and decision-making, the appeal of increased action and excitement, and providing opportunities to modify one's mood.

The successful formulation of safer gambling policies may be obstructed by the large number of complex design features, their interplay, and the dearth of research thereof. Therefore, it is essential that full consideration is given to safer gambling principles where there is at least some degree of conceptual clarity, as there is, for example, around fast, continuous play.

In practice, this does not always happen. In a recent example, a stake reduction policy was introduced by the Department for Culture, Media and Sport in Great Britain to reduce how much a player can lose on a particular form of retail gaming machine. However, the policy did not adequately account for speed of play. Consequently, faster, more continuous gaming machines, arguably posing similar levels of risk (including cost of play), were left untargeted by the stake reduction [7].

While there is a good general understanding of the risks that may be associated with fast, continuous play, our specific understanding is relatively poor. Consider the discussion points below.

2.1.4 Key areas for discussion

- 1 How fast is too fast? Reel spin rates often range from 0.5 seconds to longer than 5 seconds. Are such speeds acceptable? Why? Why not? What is the purpose of having reel spin speeds as fast as half a second? Does it add to game play or is it primarily a device to increase revenue?**
- 2 What is an optimal length of effective and efficient break-in-play? What games, features, behaviours, and/or outcomes should require or trigger a break-in-play? How should a break-in-play be applied?**
- 3 Whilst reducing reel spin speeds to 10 seconds or enforcing 5 second pauses between spins could be effective, they may also render a game unappealing and potentially unplayable. How do we move forward?**



2.2 Near wins

2.2.1 What constitutes a near win?

A near win is a losing gambling outcome that is perceived as being almost successful. This perception may be facilitated by the structural manipulation of how game outcomes are presented (see Figure 3 for examples). A near win may be emphasised using one of the following design principles:

- Focussing on more valuable outcomes such as large prizes or bonus games [18]; and/or
- Using sounds, lights and slowing reel speed to build anticipation as the bet unfolds. Building anticipation has been identified as a critical component in the near win's influence over behaviour [19].

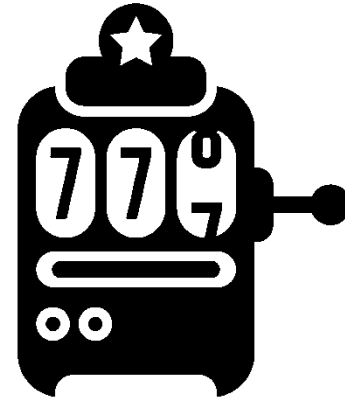


Figure 3. The evolution of the near miss.

Left: the focus of the near win is entry to a bonus game. Bonus games are valued by players because they are interactive, fun and can often yield large prizes. The near win may be constructed through the need to match two bonus symbols on reels 1 and 5 to gain bonus entry. If a bonus symbol appears on reel one, the possibility of winning a bonus game can be emphasised by sound and visual effects and reel 5 moving in slow motion (a 'slow reveal') to build anticipation.

Right: A simple near win perceived because of just failing to match three high value symbols on a single pay-line.

2.2.2 Understanding the impact of a near win

Possible explanations for why near wins may contribute to persistent or risky gambling include:

- Near wins may be exciting [20], [21];
- The anticipation created by a near win may help to modify negative emotional states [22];
- Near wins may generate additional negative emotions in-the-moment⁶ [23], which may further intensify the need to modify mood through gambling [7]; and
- Near wins may create frustration, particularly in the absence of real wins, which may strengthen resolve to play until more wins are received [24], [25] and may have the potential to increase dopamine activity as a result of uncertainty [26].

However, a number of studies [27], [28], [29], [30] have failed to find convincing support for the near win effect. This may be due in part to limitations in using laboratory research to understand the inherent risks in game design.

⁶ In other words, events that transpire while gambling, such as losing, may contribute to negative emotional states, over and above any emotional vulnerability that may have existed prior to starting to gamble.



While laboratories in which the effects of the near win are primarily examined give researchers the advantage of having greater control over the research conditions, they are limited in their ability to reflect real gambling conditions [7], [31], particularly those most conducive to harmful gambling (e.g. excessive commitments of money and time).

Near wins may also play a significant role in game appeal given their suspected contribution to the anticipation and the experience of the gamble, relative to the gambling outcome [22] and may be valued by players because of their suspected potential to create excitement and modify mood, as outlined above.

2.2.3 Challenges for the safer design of games

The near win characteristic is a regular feature of discussions at conferences, think-tanks, or working groups which examine how the structural characteristics of games can determine gambling harm. Yet to date, there has not been clear, consistent, valid support for their contribution to gambling harms. In one comprehensive review [32], the behavioural impacts of the near win observed in research, particularly impacts relevant to risk, were reported as being inconsistent and inconclusive:

“Notably, however, findings were not completely uniform across all the sampled studies, with considerable spread in the reported effects of near misses in a variety of different measured outcomes. For example, near misses were found to be associated with increasing one’s bet, decreasing one’s bet, or having no effect, each in a different study, making it difficult to determine whether near misses are capable of influencing per-play betting behaviour” (p.1254).

Not only are research findings limited by their inconsistency, but they are also limited by constraints on research design that are difficult to circumvent. For example, outcome measures in near win research (e.g. excitement; time between spins; brief periods of continued play) do not directly provide evidence of harmful gambling. Similar conclusions have been drawn elsewhere in another review [27]:

“Most of this research, however, has examined measures other than behavioural persistence, such as physiological reactions, responses latencies, or data from questionnaires. These effects are presumed to be consistent with prolonging slot machine play, but few studies have demonstrated a reinforcing effect on persistence explicitly” (‘General Discussion’, para. 8).

It is important to add that even persistent play as an outcome measure, should it find empirical support, could only provide limited insight. In other words, harmful gambling can occur in the absence of persistent play, just as persistent play could occur in the absence of harmful gambling. Research using outcome measures better approximating harmful behaviour stand a better chance of providing useful applications to safer gambling policies. Optimal selection of outcome measures is becoming easier following the rapid emergence of research into behavioural markers of harm. Admittedly, observing more precise markers of harm is no easy task for laboratory research and may reflect constraints imposed by ethical obligations [27].

Such constraints may also explain why the potential risks posed by near wins have not been adequately tested over sufficiently long periods of exposure, even in studies examining the impact of prior experience [22]. It is possible that the behavioural impact of near wins may dissipate over time as individuals become desensitised to repeated experiences of near wins being paired with zero positive financial outcome. Reid [25], one of the first theorists on the near win, acknowledged the potential for this kind of ‘cognitive restructuring’ or realisation among players [25].

His paper also provides a second longstanding acknowledgement: the near win is likely to play an important role in game appeal. However, neither issue has been sufficiently examined in research in the 35 years since. Reid (p.38) uses horse racing to illustrate his point on game appeal:



"The principal feature of those races that were judged to be "good," "interesting," or "exciting" was the "closeness" of the finish. The "worst" races were those in which the outcome was decided early in the race by the runners separating and maintaining their places. Obviously, a race is "good" if your chosen runner actually wins. Apart from that, interest is related directly to the rate at which the forecast of the final outcome improves throughout the race--the races judged best postponing the resolution of outcome to the very end and so giving more opportunities for near misses."

Finally, and importantly, acknowledgement that 'absence of evidence is not evidence of absence' is encouraged here, particularly in relation to this structural characteristic. Theoretically, at least, there remain reasonable grounds to suggest that the near win may contribute to persistent, even harmful gambling behaviour, even if such concerns are not yet borne out in the existing research. Research in laboratory settings arguably represent weaker manipulations of near wins relative to those experiences in real gambling situations among those at risk of harm.

In other words, consider a real-life scenario where a vulnerable individual is playing a gaming machine having spent several hours, and thousands of dollars they cannot afford to lose, all in one session. Consider the anticipation that may build during a subsequent spin suggesting that winning thousands of dollars (providing that 'great escape') is becoming increasingly more probable, an experience that is emphasised through immersive high quality graphics and sounds, right up to the last millisecond when it is revealed that they have won nothing. Contrast this with an undergraduate student participating in a short research study for course credit who experiences nearly winning 30 cents on a rudimentary game limited by its aesthetic and sensory features, before being told they are allowed to leave. Research needs to better tap into the former scenario before getting a more complete understanding of the potential risks associated with the near win in the development and maintenance of gambling disorder.

2.2.4 Key areas for discussion

- 1 How concerned should we be about the role of near wins in causing harm given the inconsistency in, and limitations of, existing research? Should priority be given to exploring the near win effect in situations which better reflect conditions conducive to harmful gambling?**
- 2 To what extent, if at all, should the role of near wins in game appeal be a secondary consideration in safer gambling policies?**
- 3 Are there education and prevention approaches that could be effective in reducing risk, given the growing presence and manipulation of near wins in games?**



2.3 Losses disguised as wins and volatility in gaming machines

'Losses disguised as wins' and game volatility, given their potential association, will both be considered in this section.

2.3.1 What constitutes a 'Loss Disguised as a Win'?

When the amount won in any one wager is smaller than the amount staked, this is referred to as a 'loss disguised as a win' or LDW [21] (see Figure 4). Similar to the near win, LDWs can be emphasised using light and sound effects [21], [33]. While most research on LDWs relates to multi-line slot games, they can apply to most forms of gambling [34] including single reel slot games.

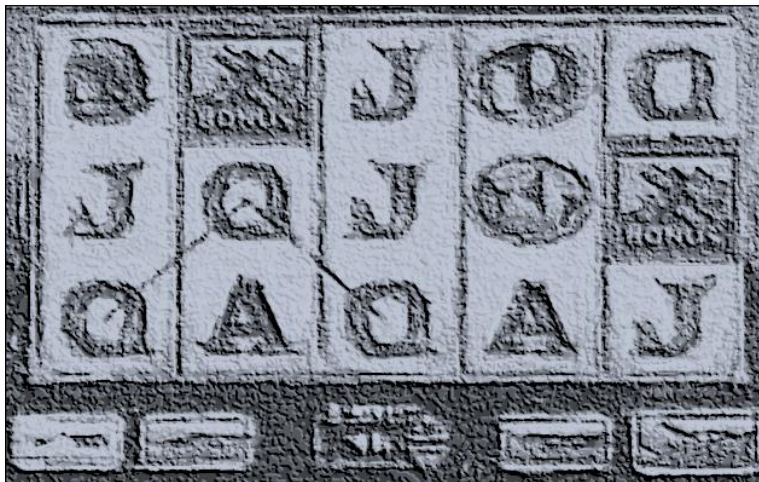


Figure 4. LDW example explained

LDW example: a slot game may offer the option of playing up to 20 win-lines per spin. If, for example, the cost of play is \$0.10 per line, the overall cost of the spin when playing 20 win-lines would be \$2.00. In this example, the outcome of the spin is three queens on only one win-line. The value of this win is equal to \$0.50. Therefore, the net financial outcome of that particular spin is -\$1.50. The use of flashing lights and sound effects adds emphasis to the outcome.

2.3.2 Understanding the impact of LDWs

According to the academic literature, LDWs may be considered a risk factor for harmful gambling for the following reasons:

- Players can misinterpret LDW game outcomes as positive financial outcomes (wins) rather than negative financial outcomes (losses) [21], [35] potentially leading to persistent play;
- The increased winning stimuli presented as a result of LDWs may lead players to overestimate the frequency of winning [36]–[38];
- LDWs can provide rewarding stimuli (e.g. sounds, lights, 'win events') and immersive gambling experiences contributing to vulnerable cognitive and emotional states referred to in the literature as 'the zone' [8] or 'dark flow' [39]; and
- LDWs can be more exciting [21] and more enjoyable [40] than losing outcomes.

2.3.3 What constitutes high volatility in gaming machines?

Volatility in gambling refers to the way a game's prize fund (determined by the payback percentage) is distributed over a relatively large number of plays. Generally speaking, higher volatility games tend to provide wins that are less frequent, less predictable but higher in monetary value at any given stake size. This will usually result in a greater number of losing bets, as a greater proportion of prize money is reserved for larger-sized wins (see Figure 5).

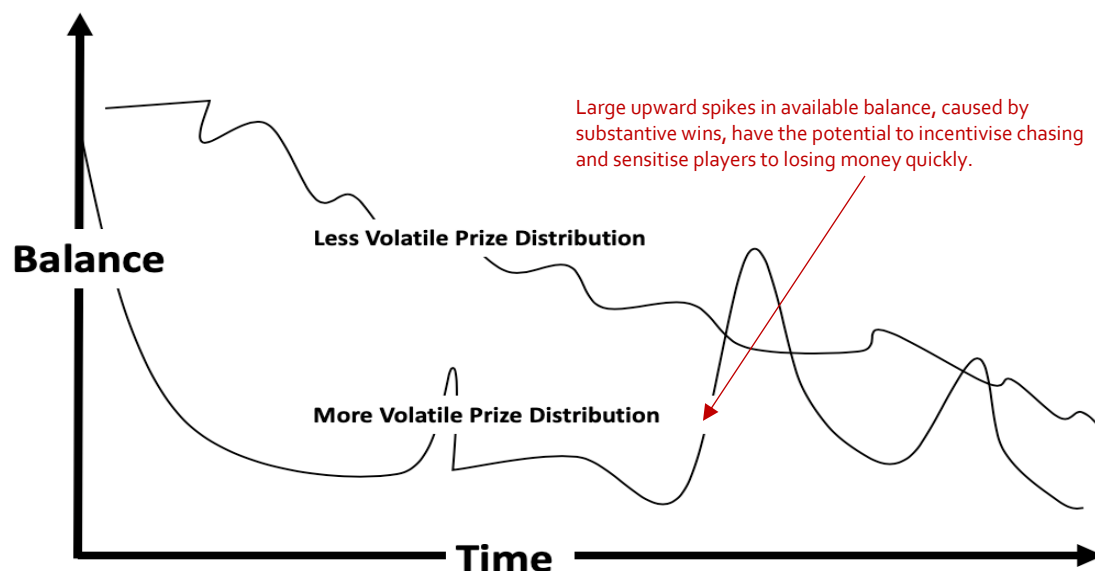


Figure 5. Differences in the volatility of gaming machines may have different implications for how money is won and lost of the course of a session of play.

2.3.4 Understanding the impact of volatility

Volatility could be viewed as a risk factor for harmful gambling for the following reasons:

- Some theories and evidence suggest that persistent gambling may be associated with games where winning and losing is more unpredictable [41], [42], and some theorists suggest that this may have a neurological basis [26].
- More experienced or vulnerable gamblers may find it more difficult to stop playing higher volatility games [16]. This may be because, through experience, they learn that large wins can sometimes follow long losing streaks, and that chasing losses sometimes (albeit infrequently) pays off.
- The powerful effect of getting random, intermittent rewards (i.e. partial reinforcement) has been observed in numerous behavioural contexts [43]. Figure 6, using evidence drawn from online gambling behaviour among disordered gamblers [16] provides an illustrative example for how resistance to extinction (i.e. finding it difficult to stop gambling) might apply.
- Research suggests that games with greater outcome uncertainty and suspense are more enjoyable and engaging. They can even be more attractive than games where there is a greater chance of winning, or where skill may be involved, players demonstrate high levels of competence [44].
- Higher volatility in games may sensitise players to long losing streaks [26] and strengthen cognitive biases such as the gambler's fallacy⁷.

However, empirical research specifically investigating the impact of win frequency (one dimension of game volatility) has produced inconsistent findings. Of note, laboratory studies were more likely to report that smaller, more frequent wins lead to persistent play (for example, [46], [47]). Conversely, research exploring actual gambling behaviour points to a significant role for higher volatility games in persistent [48] and disordered gambling [16].

⁷ The gambler's fallacy refers to the belief that a string of losses makes it statistically more likely that a win is more likely [45].



Interviews with those meeting the criteria for problem gambling using the Problem Gambling Severity Index (PGSI) revealed cognitions and behaviour reflecting the PREE effect. In these extracts, the effect of previous wins on willingness to chase losses is exemplified. One individual refers to the PREE effect as a 'form of slot nostalgia' while also suggesting that this effect applies to experienced gamblers rather than newer players ('newbies').



Some sessions are hard to fathom, as nothing seems to go right. The games I had prior successes on have turned ice-cold, and it's due to this puzzlement that I may often chase those losses with further losing deposits".

(Male, 30, PGSI=25).

"Sometimes a session will flatline so badly that you anticipate the outcome well before it happens but plough on anyway, and rarely are these predictions ever wrong. This isn't even subtle most of the time, and I think most will resign themselves to their slot fate well in advance, all the while hopeful of getting that comeback that can and does happen, albeit very rarely. This is where being a veteran slotter has its shortcomings, because they are likely to draw on a form of slot nostalgia almost, whereas a newbie will just run for the hills or get bored. I had a dreadful run just the last couple of days, not too much money lost but every game I touched would not turn. I chased a bit of course, and even now I still feel that a good hit is due!"

(Male 37, PGSI=8).



Figure 6. Views from disordered gamblers on how past experience of volatility in gambling can shape persistent gambling despite significant losses [16].

One study examining actual behavioural data from gaming machine players [49] found that LDWs lead to more betting than losing outcomes, but less betting than winning outcomes. These findings may reflect that, for any given budget, the more you win, the more you can keep betting.

2.3.5 Challenges in understanding the interplay between LDWs and game volatility

Given the role of learning in the development and maintenance of disordered gambling, these findings may not be as contradictory as they first appear. Laboratory studies may better represent individuals in the acquisition phase (i.e. new or infrequent gamblers); individuals observed in more applied settings may be more reflective of experienced or harmful gambling. Therefore, preferences for, or vulnerabilities to, different levels of game volatility may depend on experience.

Another important consideration is that the proportion of prizes being returned as LDWs (or other small wins) will, to some extent, being negatively related to the game's volatility. In other words, as you remove the number of LDWs in a random game, this will likely intensify financial swings and increase outcome uncertainty. Taken further, if higher game volatility is indeed a significant risk factor, at least for more involved individuals, then restrictions on LDWs require careful consideration. This also highlights the need for research to account for the combined effects of structural characteristics.

Finally, it is also important that acknowledge that LDWs are instrumentally different to losing outcomes. In other words, they may be better described as 'fractional' or 'partial' wins. This is not a trivial distinction. Wins of any size, including fractional wins, decelerate the rate of loss, enabling more playing time, while staying within the same budget.

2.3.6 Key areas for discussion

- 1 **Is there sufficient evidence to warrant restrictions to gaming machines addressing LDWs or game volatility? If so, what restrictions might prove most effective? If not, is more research required before direct action can be taken to promote safer gambling?**
- 2 **Can improving player awareness regarding game volatility, or LDWs, reduce any inherent risks?**

3 THE SITUATION OF GAMES

In this section, we consider the situation of games. A game's 'situation', as is referred to here, is intended to be a distinct, slimmer concept than 'environment'. The definition is limited to the settings in which games are played, and that may directly influence gambling within-session (e.g. website user interface design, background music) as opposed to broader social, cultural, or geographical factors. Specifically, we examine two current issues with applications to both online gambling (i.e. choice architecture) and offline gambling (i.e. the number and placement of gaming machines).

3.1 Choice architecture and behavioural economics in gambling situations

3.1.1 Vulnerability to riskier decisions when gambling

Assisting players in making appropriate decisions is a critical component of safer gambling programmes, as impaired decision-making around affordability is a principal determinant of whether harm results from gambling. This is because sometimes the situational demands placed on players during more intensive gambling (e.g. the emotional rollercoaster of winning and losing, fatigue, stress) may lead to vulnerable cognitive and emotional states⁸ [50] [51] and depleted self-control [52]. Such vulnerability may lead to:

- failing to adequately consider the implications of actions;
- being led by the emotional rather than the rational part of the brain;
- impulsivity and discounting of the value of long-term goals.

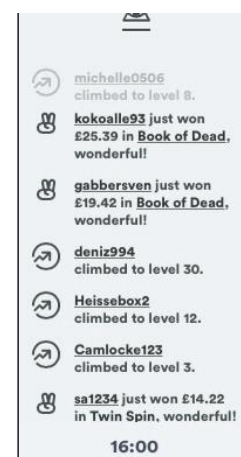
The capacity of gambling activities to create vulnerable cognitive and emotional states (in addition to its appeal to individuals who may already be exhibiting such vulnerabilities) makes a strong case for using responsible designs in online gambling environments.

Figure 7. Example of the availability heuristic from a gambling website

3.1.2 The role and impact of choice architecture in gambling

Broadly speaking, choice architecture refers to features of the immediate environment that can influence decision-making. However, the term is often reserved for those intentional design features of environments which serve the intentions of the designers (so called choice architects) [53]. Mounting evidence from a range of consumer behaviours suggests that choice architecture can influence decision-making with the potential of having both positive and negative impacts on consumer well-being [53] and financial health [54].

The question of whether choice architecture serves the interests of consumers or vendors [55] is of particular relevance to the safer gambling debate. Situations requiring important and consequential gambling decisions (e.g. how much to deposit; when to stop betting) can be presented in a range of ways. While there is currently very little empirical evidence



⁸ Theories related to 'dual system processing' refer to shifts from 'cool thinking' [50] or 'system 2' [51], to riskier cognitive states sometimes referred to as 'hot thinking' or 'system 1'.

in the case of commercial gambling, preliminary observational work [7], [56] suggests that at least some choice architecture employed in some gambling environments may exploit, rather than safeguard, decision-making by customers. Below we examine a limited selection of examples of these situational features that may exist in gambling settings.

3.1.3 The exploitation of heuristics and biases

3.1.3.1 Availability

Decision-making is often more easily influenced by information that is readily available rather than through a more thorough examination of all available options and their consequences. This tendency is referred to as the 'availability heuristic' [51]. For example, prominent promotion of other players' wins to customers while they are gambling may lead an individual to think it is easier to win than objective probability would warrant, and could encourage individuals to gamble more money or for more time than they had planned (see Figure 7).

3.1.3.2 Anchoring and Adjustments

A similar process is at work when we have to make a decision involving a number (like a deposit into a gambling account, for example). If some initial values are present (whatever their source) these can influence the current decision [57] but particularly if the value is in some way relevant to the individual [58] and is seen as the norm [59] (e.g. framed as a popular deposit amount).

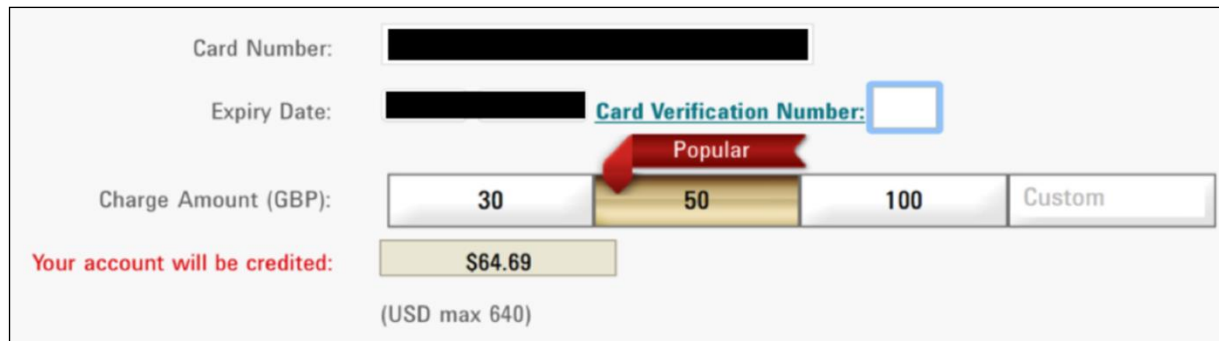


Figure 8. Anchoring example applied to customer deposit selection using default options and normative influence [7].

Figure 8 shows an example of a deposit facility where a range of deposit options have been presented. A default option (see below for further explanation) of 50 GBP has been pre-selected combined with advertising that this deposit amount represents the norm. The use of anchors, defaults and normative influence in relation to customer deposits is unlikely to promote safer gambling. In its place, customers should be prompted to appraise current levels of affordable spending, or alternatively, the minimum permissible deposit amount should be the default option, requiring further reflection and action should they wish to deposit more.

3.1.3.3 Friction and Defaults

Depending on the intentions of the 'choice architect', friction can be used to guide decisions by offering a limited selection of options that require less effort [60]. If, for example, the intention would be to keep a customer engaged, then options for players to withdraw money would be made to require more effort than deposits. For example, this might be done by reducing the button size, placing it in a less visible location, requiring more click-throughs or the removal of privileges or incentives (see Figure 9). Conversely, friction may be *reduced* in relation to decisions to reverse the withdrawal process (i.e. keep money in the account) by requiring fewer click-throughs or decision points.

Equally, removing friction could also encourage the awareness and use of responsible gambling tools. In support of this claim, research in real gambling settings [56] showed that reductions in friction associated with decisions around the uptake of responsible gambling tools increased the number of players choosing to set deposit limits and use cooling-off periods.

A default option (as illustrated in Figure 8) is a specific form of friction and can influence decision-making by presenting choices as being popular or reflecting norms, in addition to being convenient [60]. The use of defaults in gambling can apply to deposits, bet selection, bet size or for setting limits on spending. Essentially, it can apply to anything seen as instrumental in achieving the choice architects' goals. Defaults designed to nudge intended levels of spending or deposits upwards may increase risk.

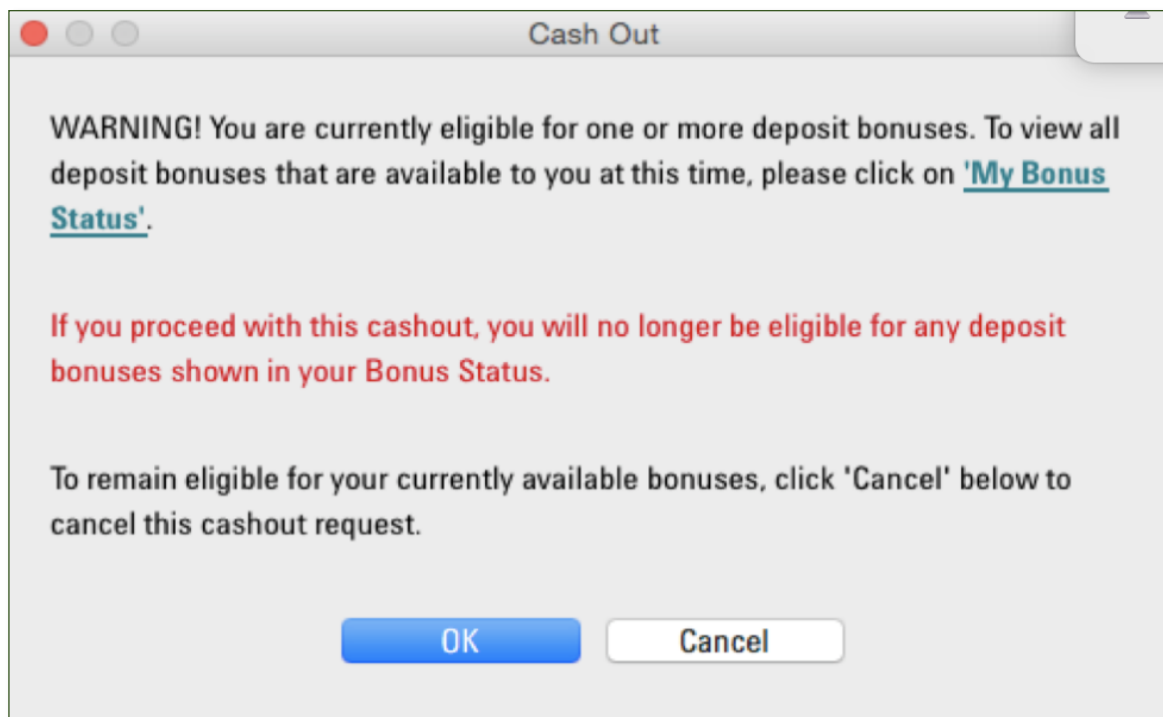


Figure 9. An example of friction where withdrawals could result in a loss of privileges. This tactic also increases number of click throughs required to withdraw, relative to deposit.

3.1.4 Gamification

Gamification refers to the use of video game elements to improve user experience and drive engagement [61] and has been used in a variety of non-gaming contexts such as health [62], finance [63] and energy consumption [64]. Gamification also appears to be used in the gambling industry, primarily to drive involvement; however, how widely such practices are adopted remains unclear.

For example, virtual rewards are digital elements linked to an individual users account which can be displayed to others to demonstrate achievement. These may include badges, trophies, skins or avatars which might be linked to the amount of game play completed or the attributed 'rank' of the user. Figure 10 shows virtual rewards in the form of trophies for faster, more frequent play, which may lead to increased risk of harms for some individuals.

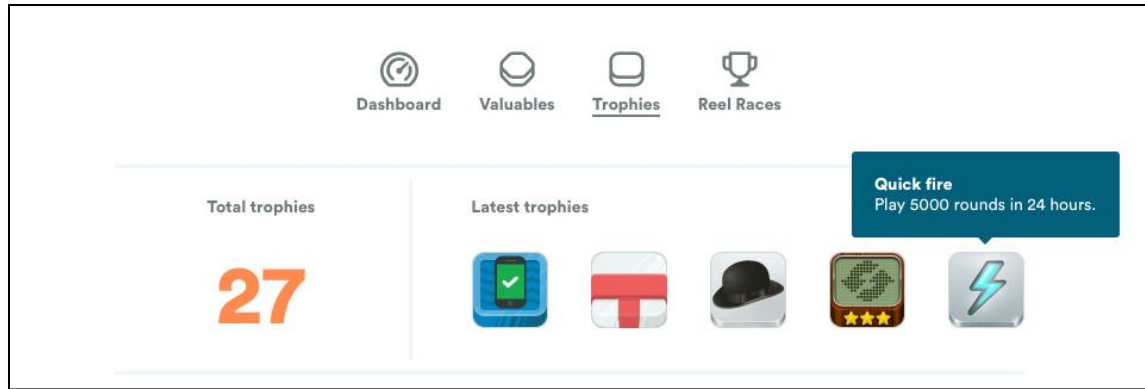


Figure 10. Examples of virtual rewards for gambling engagement: reward for high frequency play in short durations

3.1.5 Challenges for the safer situation of games

Some existing designs in gambling choice architecture may nudge players towards prolonged play, higher deposits and lower withdrawals, and may ultimately lead to pain rather than pleasure for consumers. Such 'dark nudges' have been observed elsewhere [83] and are indicative of the inherent contradictions in some operators claiming to put player protection at the heart of their business [83].

Unlike some other features of games and gambling environments, such user interfaces do not appear to significantly contribute to enjoyment or game appeal. Furthermore, it is difficult to defend these kinds of situational designs as being motivated by providing convenience to customers if only deposits are being facilitated, not withdrawals.

There appears to be a compelling case that more protective choice architecture should be required as an immediate priority for action. Identifying the 'choice architect' and determining where responsibility lies for setting directives of gambling choice architecture, will be important considerations in the safer gambling debate.

3.1.6 Key areas for discussion

- 1 **Given that decision-making is an important factor in determining harm during play, should more emphasis be placed on identifying the environmental conditions more conducive to healthy decision making?**
- 2 **Most of what we know about 'nudging' and behavioural science has been learned through its application in other areas. Which opportunities for more adaptive, healthy nudging have the most potential for being effective?**



3.2 The number and placement of gaming machines in gambling venues

There are a number of situational factors affecting gambling behaviour that have received attention in the academic literature; venue characteristics including macro casino designs [65], layout [66], and sensory enhancement using lighting and colour [67], music [68] and smell [69], in addition to a range of other components, have each been observed to influence gambling behaviour in some way. Below, we consider the specific example of the number and placement of gaming machines in land-based venues.

3.2.1 Understanding the impact of the placement of gaming machines in venue

For the purposes of this document, the term 'placement' refers to how a gaming machine is located and positioned within a venue (referred elsewhere as a micro-location factor [66]) and does not refer to wider geographical factors beyond the venue itself (e.g. its location within a community or region).



Figure 11. It remains unclear to what extent the number and placement of gaming machines may contribute to harmful gambling

A concern that emerges from the literature is the capacity for machine placement to afford privacy and anonymity to vulnerable individuals and disordered gamblers. For example, some studies have found that at-risk or problem gamblers have consistently reported preferences for greater privacy in gambling venues [70], [71], [72], with those meeting the criteria for probable pathological gambling suggesting that increased privacy when playing gaming machines was a risk factor for losing control [70]. However, the scarce experimental research has failed to support privacy as a risk factor in the laboratory. Specifically, individuals playing on gaming machines in a cubicle did not play any longer or spend more money than players in more visible, open settings [70].



Nonetheless, the potential contribution of privacy to harmful gambling should not be dismissed outright. The current lack of empirical support in the laboratory likely reflects the challenge in creating a situation comparable with harmful gambling behaviour. Vulnerable individuals are likely to prefer privacy while gambling for a range of reasons (e.g. concealing gambling involvement; hiding embarrassing behavioural indicators of harm; requiring privacy for achieving certain need states, such as dissociation), many of which are unlikely to apply while participating in a laboratory research study. However, privacy as a determinant of harm has not received nearly enough research attention to form any empirically supported view.

Consideration has also been given to product positioning in the marketing literature. Here, the dependent variable of interest is usually the 'slot performance' (i.e. the capacity to generate revenue) from gaming machines. Evidence suggests that terminals placed in locations providing good accessibility and visibility to potential customers are more likely to generate a greater volume of play and revenue [73], [74]. For example, one empirical investigation found machines located in aisles that border walkways or at the end of the row of terminals could increase revenue for that machine as much as 35% [66]. In more recent study, however, these findings were not replicated [75].

Note that the focus of marketing research is on revenue per machine, and not necessarily on player experiences or harmful gambling. Consequently, it remains unclear whether more revenue per slot is a consequence of a larger number of customers spending a relatively low amount of money, or fewer customers spending larger amounts. Given preliminary evidence suggests that disordered gamblers may have a preference for increased privacy (i.e. low accessibility and visibility) the former may be more probable.

3.2.2 Understanding the impact of the number of gaming machines in venue

Studies examining the impact of the number of gaming machines in a venue, taken together, yield inconclusive findings. For example, problem gamblers in one study [76] reported that offering a larger number of gaming machines was one of several determinants in choosing a gambling venue. However, in the same study, this preference applied only to those playing in smaller venues. Furthermore, gamblers in smaller venues were found to be four times more likely to be associated with problem gambling. In contrast, other research suggests that larger venues are linked with higher net expenditure [77], longer session lengths [78] and more persistent play [79].

An evaluation of a trial harm reduction policy in Australia in which gaming machine numbers per venue were reduced by 15% found that players modified their behaviour by spending larger amounts on fewer machines [80]. Consistent with this finding, players interviewed in the study reported that they believed the reductions would have no impact on their spending, nor in combating problem gambling. However, the study's author raises two notes for caution in interpreting the findings. First, the numbers of machines removed represented a relatively small percentage of the total number of machines available in that area. Second, the operators were left to determine which machines they would relinquish (possibly opting to retain their more profitable terminals).

Having a larger number of machines in a venue may provide some level of risk through greater variety in consumer choice, a theory for which there has been at least some preliminary support. For example, surveys exploring venue preferences identified that at-risk and problem gamblers reported stronger preferences for wider game variety in venues relative to non-problem gamblers [71], [81]. However, a notable finding from the study was that 'low-risk', 'moderate-risk' and 'problem gambling' groups all expressed similar preferences for game variety, but only the 'problem gambling' group expressed a strong preference for privacy.

Gaming machine placement has also received brief examination in studies examining the role of a broader range of venue characteristics in real gambling settings. One such observational study [82] concluded that modifying the layout of gaming machines was unlikely to be influential as a harm minimisation strategy. Of potential interest for further research, one participant did suggest that *"If there's one thing I could change it would be make them break up the displays so not all in a solid line, because then you're trapped"* (p.29). However, placement impacting on the ability to leave a venue was not reported by other participants, nor did it emerge from the observational data.



3.2.3 Challenges for the safer design of games

Some, albeit limited, evidence suggests that the positioning of games promoting anonymity and privacy may increase harmful gambling. This may be among the more significant concerns emerging around how games are positioned in a venue. Given the potential motivation to seek privacy among more vulnerable populations, divergent machine floor locations intended to increase the visibility and accessibility of gaming machines may be more significant in capturing the leisure spend of less frequent players. However, although the potential for privacy to facilitate riskier playing styles makes sense conceptually, it may present a range of challenges that require detailed consideration; see the discussion points outlined below.

The potential nature and significance of any relationship between the number of gaming machines per venue and harmful gambling may be even less straightforward. Drawing what one can from the research evidence, it remains unclear whether increases in the variety and the alternatives afforded by greater machine numbers simply reflects a preference for greater choice among more involved consumers. Alternatively, if machine numbers do play a causal role in harm, it is likely to be through a complex process. For example, it was problem gamblers in smaller venues who had expressed preferences for more machines, which raises the possibility of a non-linear relationship between machine numbers and harm. In other words, this may represent concerns around retaining access to gaming machines during busy periods, when there may already be a small number of machines from which to choose.

While marketing research has focussed on designing environments to capture customers and their spend, the focus on player satisfaction (and well-being more broadly) seems secondary in its consideration in research, if it is considered at all. This disconnect is highlighted by the framing of 'slot performance' as being revenue-driven in marketing research [73], [74]. Thus, future-proofing venue design will require the effective combination and management of marketing and player protection directives, two directives which many may still consider to be in direct competition.

3.2.4 Key areas for discussion

- 1 Evidence suggests that the situation of games affording greater privacy and anonymity may be a risk factor for harm and disordered gambling. Is the strategic reduction or removal of privacy in venues a realistic option to make gambling safer? If so, how? Are there possibilities for unintended consequences? For example, would there be a risk of displacing vulnerable players to gambling channels affording higher levels of privacy and anonymity with fewer opportunities for staff identification and interaction.**
- 2 Relative to other structural and situational factors (e.g. speed of play, choice architecture to drive spending) how should the number and placement of gaming machines be prioritised in safer gambling deliberations and related future research?**

4 FUTURE-PROOFING THE SAFER DESIGN AND SITUATION OF GAMES

Along with individual and broader environmental influences, the design and situation of games have the potential to make significant contributions to harmful gambling [1]. However, their relative impact and causal nature remain poorly understood. Nevertheless, it is right that we do not allow a lack of evidence to inhibit progress in supplying gambling in a safer, more sustainable way. So, what do we know? What do we still need to find out? How do we move forward?

With these questions in mind, this paper concludes by taking stock of existing knowledge⁹ and proposes conference discussion points for accelerating progress.

4.1.1 What we do know

In considering the issues raised in this paper, it is proposed that the following assessments can be made with some degree of confidence:

1. Various properties of games appear to appeal to consumers. This appeal is derived from satisfying certain needs (e.g. excitement, mood modification, suspense). However, in some cases, these same game properties can induce vulnerability and, in turn, can lead to harm.
2. Precisely through which design combinations, and by what mechanisms, harmful outcomes may occur remains relatively unclear. However, a strong case can be made that riskier products are more likely to comprise some combination of the following: more volatile financial outcomes (i.e., amounts won and lost); provision of prompt feedback on betting outcomes; fast, continuous opportunities to place bets and re-stake wins; and being situated on websites, or in venues, where certain contextual designs (e.g. dark nudges) may promote unhealthy gambling decisions and exploit cognitive and emotional vulnerabilities.
3. Some design features could be targeted immediately. This is based on the principle that they appear to contribute little to consumer experience or the appeal of a game, while simultaneously posing at least some degree of risk (e.g. choice architecture).
4. 'Game success' appears to be measured by industry using performance metrics such as revenue rather than consumer experience. When dealing with an addictive behaviour like gambling, one does not necessarily imply the other. In order for the gambling industry to be sustainable, performance metrics should be reconsidered to seek to capture revenue derived from consumers' pleasure rather than their pain. This is an existential question that may have imminent commercial implications at a time when the public's attitude to gambling continues to decline.

4.1.2 What we do not know

1. There remains a lack of evidence and expert consensus on the extent to which specific structural and situational characteristics contribute to harmful gambling (e.g. near wins, LDWs). Notably, these characteristics account for the majority of academic investigations into game design, and are held by some as priority areas for immediate safer gambling restrictions.

⁹ In this paper, various aspects of design are considered. However, other aspects, not covered here, should also be recognised as important. For instance, cost of play (e.g. stake size; payback percentage) or methods for budgeting and paying for gambling (e.g. mode of payments, access to additional funds) are also likely to play an important role [7].



2. Even where we can be more confident that characteristics pose greater risks (e.g. fast, continuous play), more precise knowledge is required to give us the best chance for preventing and reducing harm. For example, how fast is too fast? What is the appropriate duration of a break-in-play?
3. There are also gaps regarding how academic research might be applied to safer gambling strategies. For example, the *combined impact* of different design features (aggregated in the form of one gambling product) is poorly understood (e.g. the potential trade-off between the identified risks of win frequency and game volatility discussed earlier).
4. It is also unclear how product risks may vary at different stages in the development and maintenance of gambling disorder. For example, do products offering frequent, smaller, more consistent rewards play a bigger role during early experiences of gambling? Do more volatile games pose the greatest risk to more involved, vulnerable individuals?
5. It is also difficult to account for how product risks might vary according to consumer differences (e.g. variations in motivation, personality and underlying biological vulnerabilities).
6. The latter two of these knowledge gaps are vast. In considering all of these points, we appear to be a long way from having a definitive understanding of how numerous factors combine together to pose risks as a single product. These knowledge deficits suggest caution should be exercised to avoid over-reliance on over-simplistic, one-size-fits-all approaches for assessing product risks.

4.1.3 A dual approach for accelerating progress

Over the course of the conference, consideration should be given to how various stakeholders across multiple jurisdictions can contribute collaboratively in order to accelerate progress in making games safer. Importantly, it is proposed that we do presently have sufficient information to adopt two concurrent work streams to accelerate progress towards future-proofing the safer design and situation of games:

1. Identifying priorities for taking immediate action, and;
2. Adopting a long-term, collaborative and strategic approach to generating applied knowledge.

We currently have approximate indications of risk on a limited number of design features to guide us in identifying priorities for taking immediate action in both commercial and regulatory contexts. Where there is confidence in the best course of action, such work should begin immediately. Where there is some degree of uncertainty in the best course of action, trial and evaluation can be used to generate reliable evidence and uncover possible unintended consequences.

Knowledge gaps in critical areas significantly impeded progress in making games safer. Adopting a long-term, collaborative and strategic approach to generating applied knowledge that all stakeholders consider valid and reliable may be one of the most critical requirements for making progress.

4.1.4 Key areas for discussion

1 Which actions to make the design and situation of games safer could begin immediately?

Which actions carry some degree of uncertainty but could be trialled and evaluated by the gambling industry to examine their effectiveness?

2 What is the best way to agree and establish guidelines for managing potential conflicts of interests emerging from the collaboration of various stakeholders who may have diverging interests?

3 Is it possible to develop and agree guidelines for researchers, regulators and charities to adopt when collaborating with industry? If so, how should this be done?



- 4 Do competitive advantages exist between companies (or even between regulators, academics or other stakeholders) on the basis of their comparative progress in advancing safer gambling? If so, does this result in a reluctance to share advancement and learning? If so, how should this be managed?**
- 5 What principles and processes should be included in game design policies? Who should have responsibility for developing and implementing game design policies (e.g. industry, regulator, others)?**
- 6 How can knowledge generated from academic research, and industry trailing and evaluation, be transferred and applied most effectively to make game design safer?**
- 7 Would effective identification and intervention of harmful gambling ever mitigate the need to restrict the supply of products and their features? Might there ever be a possibility where risky, exciting and appealing games become acceptable, provided effective safeguards were in place?**
- 8 Is player health in competition with the long-term commercial objectives of growth and sustainability? Do short-term barriers exist where profits are concerned, for example, around the potential implications of a temporary fall in profits? If so, what are they, and how can they be managed? Can more sustainable gambling companies ultimately generate more revenue? How can we begin to maximise pleasure and minimise harm in gambling venues?**

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