Behavioural economics and gambling: A new paradigm for approaching harm-minimisation


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Abstract

The premise of this article is that an understanding of behavioural economics can inform and improve the effectiveness of gambling policies and practices. Existing interventions to minimise gambling-related harms appear to be ineffective. Many conceptual models of gambling consider the role of cognitive distortions in potentiating harmful gambling outcomes, however, policies and practices often fail to recognise the heuristics (and resulting biases) that drive ongoing gambling. A behavioural economics approach to gambling public policies and interventions acknowledges humans do not always act in their best interest and introduces a range of policy tools that better motivate behaviour change. This paper reviews insights from psychology and behavioural economics to develop recommendations for gambling harm-minimisation policies. Behavioural science tools such as commitment devices, personalised messaging, and more generalised ‘nudges’ can be effective across the entire spectrum of gambling-related harms. The interventions recommended involve low-cost, subtle tweaks to the decision-making environment that promote agency, encourage positive behavioural change, and improve measurable outcomes. A multidisciplinary, evidence-based approach to developing gambling policies is recommended to enhance gamblers’ well-being.

**Keywords:** gambling; harm-minimisation, behavioural economics; policy; evaluation; problem gambling; biases
Behavioural Economics and Gambling: A New Paradigm for Approaching Harm-Minimisation

Gambling is a historically and culturally prevalent pastime that is broadly accepted in many cultures and societies in its various forms. Evidence suggests that most people who engage in gambling activities do so at low levels and experience no negative consequences of their behaviour (Castrén, Kontto, Alho, & Salonen, 2018; P. Delfabbro & King, 2012). However, it is increasingly recognised by communities, industry groups, gambling regulators, and politicians that there are serious harms associated with gambling for at least a subset of individuals, and all of these groups have a responsibility to undertake efforts to address these issues (Ladouceur, Blaszczynski, Shaffer, & Fong, 2016). Yet, despite decades of efforts to develop and implement harm-minimisation gambling interventions, few have been effective (Ladouceur, Shaffer, Blaszczynski, & Shaffer, 2017; Livingstone, Rintoul, & Francis, 2014). Gambling-related problems at various levels are relatively widespread in the population, including those experiences related to another person’s gambling. For example, Australian research indicates that up to six people are affected by every problem gambler, and gambling problems are a social issue on a similar order of magnitude to major depressive disorder and alcohol misuse and dependence (Browne et al., 2016; Goodwin, Browne, Rockloff, & Rose, 2017). Even those who experience less serious impairments stand to benefit from initiatives to minimise gambling-related harms, as would the many people affected by another person’s gambling (Goodwin et al., 2017; Langham et al., 2016; Li, Browne, Rawat, Langham, & Rockloff, 2017). Consideration of a new approach to reframe our thinking and look more broadly across academic disciplines to address gambling harms would be beneficial for policy makers, researchers, stakeholders, and gamblers themselves. The current paper proposes that the field of behavioural economics offers a
valuable perspective for the gambling and broader addiction fields. This paper focuses on understanding the heuristics and biases that drive behaviour with an aim of guiding the development of effective interventions to minimise gambling-related harms. We conclude that greater cooperation between stakeholders to conduct real-world trials of policies that preserve autonomy, but are persuasive and make it easier for individuals to enact behaviours that would minimise gambling-related harms would make a significant impact on the serious public health issue of problem gambling.

**Brief introduction to gambling**

Gambling is an instance of risky decision-making whereby money is staked on the uncertain prospect of a larger outcome. Given this strong element of risk, gambling has long been a topic of interest for economists. ‘Gambling’ tasks have often been used to simulate risk-taking scenarios to study human behaviour and decision-making in psychology and economics (Buelow & Suhr, 2009). The harm associated with gambling behaviour is thought to lie along a spectrum of risk, with such risks including increased investment of time and money spent gambling, a preoccupation with gambling and gambling losses, and continued gambling despite negative personal, financial, and familial outcomes (Hodgins, Stea, & Grant, 2011; Langham et al., 2016).

Problem gambling is an important public health issue. The costs to society have been estimated to be as much as AUD $7 billion in the Australian state of Victoria alone, and the U.K. government is estimated to spend £1.2 billion per annum on gambling-related social costs (Browne et al., 2017; GambleAware, 2016), including substantial costs related to low and moderate levels of gambling problems. From a purely economic perspective, these figures
suggest that investment in efforts to develop and evaluate effective prevention and treatment strategies would be highly beneficial for individuals, families, and society.

**Behavioural economics and conceptual models of gambling**

Traditional economic theory postulates that human decision-making and behaviour are based on purely rational choice, whereby humans act to maximise benefits and minimise costs (Becker, 1962; Simon, 1955). Neoclassical economics assumes that people have rational preferences among outcomes, strive to maximise utility, and act independently based on full and relevant information (Henry, 2012; Weintraub, 1999). Recent empirical research has increasingly demonstrated that behaviour systematically deviates from what traditional models predict, with individuals frequently acting against their own long-term-interest, reflecting the tension between immediate and delayed gratification (Dassen, Houben, & Jansen, 2015). Given the widespread recognition that ‘the house always wins’, gambling is a key example of this deviation.

Behavioural economics increases the explanatory power of economics by incorporating concepts from psychology that influence decision-making (Tversky & Kahneman, 1973, 1974). For instance, behavioural economics suggests that individuals cope with uncertainty and complexity in their lives by using a small number of general purpose heuristics (shortcuts to decision-making that bypass formal cost-benefit analysis) for simplifying judgments and making decisions. These tools work reliably and save time and effort but can also lead to predictable errors called ‘biases’.

Many biases are exhibited in gambling, even by low-risk social gamblers (Blaszczynski & Nower, 2002; Delfabbro & Winefeld, 2000; Miller & Currie, 2008), and many of the heuristics discussed in behavioural economics parallel gambling cognitions. The ‘sunk cost’
Effect is a type of loss aversion in economics that explains how people will persist with an activity in which they have already invested time, money, and effort, in order to recover their losses (Arkes & Blumer, 1985; Garland & Newport, 1991; R. Thaler, 1980). This fixation on recovering losses is similar to the concept referred to in psychology as ‘loss chasing’, commonly seen amongst gamblers and exaggerated in problem gamblers (Blaszczynski & Nower, 2002; S. Gainsbury, Suhonen, & Saastamoinen, 2014; Toneatto, 1999). ‘Mental accounting’ refers to people perceiving money differently depending on factors such as the origin, form, or intended use of the money (Prelec & Loewenstein, 1998). Gambling operators benefit from this heuristic by reducing the salience of money (or the ‘pain of paying’) through credits, casino chips, and online funds transfers (Shah, Bettman, & Payne, 2014). For example, online gamblers who experience gambling problems commonly report that using electronic funds to transact increases their gambling expenditure more than cash transactions (Gainsbury, Russell, Wood, Hing, & Blaszczynski, 2015; Hing et al., 2015). Once money is within an online gambling account, this may lead customers to ‘bracket’ their funds for gambling specifically, rather than using their funds for other activities (Imas, 2016; Zelizer, 1997).

Even the most common psychological biases reported in gambling stem from well-referenced heuristics. The ‘gambler’s fallacy’ and ‘hot hand’ effect rely on the ‘representativeness heuristic’ which assumes short sequences of events should represent the larger distribution of the outcome(s) (Ayton & Fischer, 2004). In the case of the gambler’s fallacy, after a sequence of the same outcome (e.g., three reds), a negative autocorrelation is predicted (e.g., black), whereas for the hot hand effect, after a sequence of wins or losses, a positive autocorrelation is predicted (Ayton & Fischer, 2004; Sundali & Croson, 2006; Tversky & Kahneman, 1971). Whilst the direction of the autocorrelation predicted are different in these
two phenomena, in both cases, the flawed assumption stems from viewing a series of independent (chance) events as dependently related, so that the outcome of one event affects the outcome of the next (Gilovich, Vallone, & Tversky, 1985). Other examples of this effect in gambling are loss chasing, where players on a long losing streak believe that a win is owed or due, and in lottery players, where players avoid choosing runs (1, 2, 3, 4) or patterns (Studer, Limbrick-Oldfield, & Clark, 2015). The ‘illusion of control’ heuristic is also prevalent in gambling, whereby players show an enhanced belief in their own skill (even in a chance-based game), related to the ‘overconfidence’ effect and ‘optimism’ bias in behavioural economics (Langer, 1975; Moore & Healy, 2008; Sharot, 2011). These (and other) gambling biases have been linked to increased gambling expenditure and time spent gambling, despite the occurrence of losses (Harrigan, MacLaren, Brown, Dixon, & Livingstone, 2014; Jensen et al., 2013). Yet, gambling venues and games exploit these heuristics. For instance, stopper buttons on slot machines encourage illusory control beliefs (Chu, Limbrick-Oldfield, Murch, & Clark, 2017). Roulette games display a history of red/black outcomes, which fosters the gambler’s fallacy (Barron & Leider, 2010; Croson & Sundali, 2005), and slot machines provide losses disguised as wins whereby the player is congratulated for a win, with the value being less than that of the bet (Dixon, Harrigan, Sandhu, Collins, & Fugelsang, 2010). This is particularly concerning considering that gambling biases are elevated in clinical Gambling Disorder and have been found to activate areas in the brain associated with an actual win (Clark, Lawrence, Astley-Jones, & Gray, 2009; Michalczuk, Bowden-Jones, Verdejo-Garcia, & Clark, 2011; Miller & Currie, 2008).

From a policy and treatment standpoint, it is important to recognise that gambling-related cognitions are not static. Individuals may have intentions to limit their spending during sessions,
but subsequently change their minds, or fail to adhere to their pre-set limits (Hare, 2006; Lalande & Ladouceur, 2011; Nower & Blaszczynski, 2010). Gamblers also often acknowledge their faulty beliefs outside of the game (Ladouceur, Sévigny, Blaszczynski, O’Connor, & Lavoie, 2003). During the action of the game, gamblers appear to ‘switch’ to a more biased state. This switching is compatible with the ‘dual systems’ models of decision-making that describe the balance between an emotional, impulsive system, and a calculative, reflective system (Kahneman, 2011). An obstacle for problem gambling prevention programs, such as education on the statistics of gambling, is that training the reflective system may fail to stop gamblers switching into the more emotional mode (Williams & Connolly, 2006).

The heuristics described here are a partial list. They help to explain the lack of success of information-based interventions designed to change gambling behaviour by simply informing people about the risks of gambling and the low chances of winning jackpots (Monaghan & Blaszczynski, 2009). The strength of biased cognitions and their impact on gambling behaviour is also exemplified in the effectiveness of cognitive treatment programs focusing on correcting erroneous perceptions of randomness (Ladouceur et al., 2001), and in one of the most widely provided programs to minimise gambling-harms, self-exclusion. Self-exclusion is a voluntary agreement that an individual enters into with a gambling operator, acknowledging that they are not able to control their gambling behaviours and will likely act against their own self-interest, particularly during play (Gainsbury, 2014). Gambling policy should also recognise the importance of heuristics and biases in gambling behaviour and assist in overcoming them. Addressing biases within gambling may occur at an individual or population level depending on the strategies used.

**Barriers to effective gambling harm-minimisation policies**
There are several barriers to policies that aim to minimise gambling-related harms. First, despite high social costs, gambling generates significant funds for the gambling industry and governments either directly through ownership or indirectly through taxation (Korn, 2000; Productivity Commission, 2010; Walker & Jackson, 2011). This creates a conflict of interest for government and industry bodies, as strategies that lead to a reduction in gambling have an impact on revenue, particularly when most gamblers gamble without harm (Korn, 2000; Ladouceur et al., 2016). The widely known Reno model, a science-based responsible gambling framework, recognises that effective harm reduction policies should not unnecessarily disrupt non-problematic gamblers (Blaszczynski, Ladouceur, & Shaffer, 2004). Evidence also suggests that many gamblers are supportive of efforts to address gambling harms, and are willing to accept mild disruptions to their own gambling if the strategy is perceived to benefit others (Gainsbury, Aro, Ball, Tobar, & Russell, 2015a; Gainsbury, Jakob, & Aro, 2018).

Second, strategies that rely on voluntary use by individuals, such as self-imposed restrictions on gambling expenditure and monitoring of play, are poorly utilised by gamblers (Ladouceur, Blaszczynski, & Lalande, 2012; Livingstone et al., 2014). These interventions have often been implemented following community consultation and/or surveys suggesting support for government-led gambling harm-reduction strategies, rather than based on empirical evidence for their likely impact (Gainsbury et al., 2018; Ladouceur et al., 2012). These voluntary strategies fail to bridge the ‘intention-action gap’, whereby people frequently fail to act on their intentions (Sniehotta, Scholz, & Schwarzer, 2005). For instance, many gamblers report setting time or expenditure limits, but fail to adhere to these limits during play (Lalande & Ladouceur, 2011). This lack of action can result from more immediately gratifying outcomes (i.e., the potential to win), from individuals perceiving the resource not to be relevant for them, or from a
failure in the design environment such that the intervention does not sufficiently meet a gambler’s needs, or is too difficult to use (Gainsbury, Hing, & Suhonen, 2014; Gainsbury et al., 2018; Ladouceur et al., 2017; Nisbet, Jackson, & Christensen, 2016; Rowe et al., 2017). Harm reduction strategies must be better tailored towards overcoming a gambler’s action-intention gap.

A third barrier to the success of gambling harm reduction policies is a failure to identify and target a specific behaviour. There is no robust or inclusive definition of gambling harm, as it is difficult to determine the size of bet, frequency of gambling, or level of negative personal, financial, or familial consequences that classifies problematic gambling behaviour (Shannon, Anjoul, & Blaszczynski, 2017). This is further complicated by the diverse selection of gambling games offered, ranging from purely chance-based games (e.g., slot machines) to games that involve skill and chance (e.g., blackjack), and by different definitions of ‘risky’ gambling behaviour used in experiments (e.g., bet size, doubling up, etc.). Further problems with the specificity of gambling policies include: 1) the lack of clearly defined harms related to gambling; 2) the use of non-specific terms, such as ‘responsible gambling’; and 3) an absence of relevant metrics broadly collected, such as the involvement of gambling in divorce and custody hearings, crime, incidents of domestic violence, and presentation for non-specialist gambling treatment mental health and medical services (Hing, Sproston, Tran, & Russell, 2017; Ladouceur et al., 2016; Rowe et al., 2017; Shannon et al., 2017). These problems present difficulties in measuring the success of programs and need to be addressed in order to create specific and measurable program and policy outcomes.

As discussed in the following sections, a behavioural economics approach offers promising solutions to address these three overarching harm-minimisation barriers. However, the authors note that gambling-related harms occur in a broad social-political context and
behavioural economic-based strategies do not address the entire range of factors requiring consideration. Further, behavioural economic approaches may be less suitable for those experiencing severe gambling-related harms given that “nudge” approaches tend to be most effective when they assist people to behave in ways that they are ultimately inclined to agree are important.

**Behavioural economic approaches to public policy**

A behavioural economics approach to public policy acknowledges that humans do not always act in their best interest and focuses on developing solutions that put real human behaviour at the centre of policy and program design (Thaler & Sunstein, 2008). These policies often use a ‘libertarian paternalism’ approach, whereby the intervention is designed using behavioural insights to bring large benefits to those exhibiting poor behaviours, while imposing little or no cost to those acting responsibly (Thaler & Sunstein, 2008). These policies shift customers toward a normative or desired behaviour whilst preserving a customer’s ability to choose between the available options. Many successful interventions have used carefully designed and tested ‘nudges’, which involve making subtle alterations in the choice environment to encourage behaviour change (Oliver, 2013; Thaler & Sunstein, 2003, 2008). One example is the inclusion on letters of notice from the UK taxation office that ‘most citizens pay their taxes on time’. This did not inconvenience those who pay their taxes, but resulted in an increase in taxes collected within the specified timeframe (Hallsworth, List, Metcalfe, & Vlaev, 2017). These types of nudging interventions are often based on inexpensive, small environmental tweaks that promote agency, quantify behavioural outcomes, and shift large populations in predictable directions when designed well. Nudges may focus on changing behaviour at an individual level, and although they are not intended to address some of the broader issues, they
may be politically easier to implement than larger changes to the provision or availability of gambling.

There are many benefits to incorporating behavioural economics into policy development for public health issues (Chetty, 2015). First, the multidisciplinary perspective of behavioural economics allows a broad conceptual base from which policy tools can be developed to influence behaviour. Second, behavioural economics offers more accurate predictions about the effects of policies through the integration of evaluation and testing into policy development. Third, by accounting for people’s decision-making processes and biases, behavioural economics can enhance the expected outcomes of policies. Behavioural economics is already being incorporated into policy-making internationally. However, despite some efforts to facilitate cross-disciplinary collaboration, academic gambling research is largely conducted in disciplinary silos. This limits the potential gains that can be made through multi-disciplinary collaboration. For stakeholders, the disparate field makes it easy to collate and integrate relevant academic research that could inform policy.

**Applying behavioural economic principles to gambling**

While conceptual models of gambling consider the role of cognitive distortions (or biases), policies and practices often fail to recognise the heuristics and resulting biases that drive ongoing gambling. Gambling policies have predominately been ‘think’ policies, based on deliberative decision-making whereby people are provided with information and subsequently expected to behave rationally based on this (Blaszczynski et al., 2004; Kahneman, 2011; Stanovich & West, 2000). Many of the heuristics and biases considered in behavioural economics have potential application to minimise harm during play (e.g., by reducing cognitive distortions and bet size), as well as in prevention and treatment efforts (e.g., through messaging
and commitment devices). The solutions discussed are not intended to be exhaustive, nor are they exclusive to one type of harm.

The behavioural economics heuristic of normative social influence emphasises that people tend to make social comparisons and modify their behaviour based on what they perceive others to be doing (Cialdini, 2003; Cialdini & Trost, 1998; Feldman, 1984; Hackman, 1992). Providing individuals with tailored normative feedback on how their gambling behaviour and expenditure compares with others has been successfully incorporated into gambling treatment programs (Edgerton, Biegun, & Roberts, 2016; Gainsbury & Blaszczynski, 2011). Such strategies are thought to enhance self-awareness of behaviour and increase motivations to modify behaviour as necessary. Normative messages are an example of a cost-effective, subtle behavioural intervention that could reduce gambling for a proportion of gamblers at-risk of developing problems, whilst minimally disturbing recreational gamblers. For example, individuals could receive activity statements with a clear summary of their monthly net gambling outcome that include a statement or graphic comparing their gambling outcomes with the average bettor. This is similar to techniques used to reduce electricity and water consumption (Schultz, 2014). However, one should be mindful of, and measure, unintended consequences. For instance, informing people that they are below the average level of consumption can increase poor behaviour, termed the ‘boomerang’ effect (Cialdini & Trost, 1998; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Moreover, providing feedback on gambling may encourage loss chasing for problem gamblers, if the feedback reminds them of their losses, which they wish to recoup through further gambling in the anticipation of wins (Ladouceur et al., 2012; Mizerski et al., 2012). To achieve optimal behaviour modification, policy initiatives should combine
normative messages with other nudges, such as non-financial penalties or incentives like smiley faces and words of encouragement, recognising desirable behaviour (Schultz et al., 2007).

Another cost-effective behavioural economics approach is personalisation, which is highly relevant for gambling interventions. An increasing proportion of all gambling is now based on individual player accounts, which allow players to accrue loyalty points, keep track of their gambling expenditure, wins and losses, and receive updates from gambling operators and regulators. These player accounts have the potential to enable sophisticated harm-minimisation strategies, including personalised messages that target players based on individual characteristics and patterns of play (Gainsbury, 2011). Such tailored feedback outperforms traditional warning or informative messages as it is more likely to be read, remembered, and viewed as personally relevant (Larimer et al., 2012). Tailored feedback is common practice in marketing and health communication due to its apparent effectiveness in changing behaviour long term (Jung, Ginis, Phillips, & Lordon, 2011; Kreuter & Wray, 2003; Nollen et al., 2007; Postma & Brokke, 2002; Strickland et al., 2015; Xu, Liao, & Li, 2008). Furthermore, unlike alcohol, there are no standard guidelines for ‘safe’ levels of gambling that could be recommended as a public education tool for the whole population (Currie et al., 2006, 2017). Player information can be used to assist players to work out their own affordable gambling limits, as compared to regulatory guidelines. This has been termed ‘asymmetric paternalism’ (Camerer, Issacharoff, Loewenstein, O’Donoghue, & Rabin, 2003), with the term asymmetric referring to the intention of the intervention to help those who need to change their behaviour, without disturbing those who are making informed and deliberate decisions.

During play, there are many features of a game that encourage ‘flow’ or continued gambling with attenuated thought (also termed dissociation), thereby minimising switching
behaviour (Diskin & Hodgins, 1999). One basic feature includes the ‘bet again’ button, which saves a player’s previous bet size and pay-line(s) choice, and is common on electronic gaming machines, casino table games, and various online gambling options. The transfer of cash into credit or chips also facilitates flow, by way of it being easier to keep gambling than return to the cashier to exchange chips or credits for money. Creating friction may prompt gamblers to switch from an impulsive to a reflective state, and consider whether they want to continue gambling, take breaks, or stop altogether. Dynamic messages that break any dissociation and attract attention have been more effective when they ask gamblers “Do you need to take a break?”, as opposed to providing factual information about the low chances of winning with no suggested behavioural action (Gainsbury, Aro, Ball, Tobar, & Russell, 2015b). One of the most effective policy changes in terms of reducing gambling expenditure was the introduction of smoking bans that caused gamblers to take a break and leave the gambling venue to smoke, resulting in a reduction in gambling among smokers (Bradley & Becker, 2011; Garrett & Pakko, 2010; Pakko, 2008). Breaking a repeated and default pattern of responding can therefore reduce mindless and unintended continued gambling, and potentially excessive expenditure.

Pre-set courses of actions termed ‘defaults’ are also a powerful determinant of behaviour and are recognised in behavioural economic initiatives ranging from enhancing savings for retirement to increasing rates of organ donation (Abadie & Gay, 2006; Brown, Liebman, & Wise, 2009; Johnson & Goldstein, 2003). Default settings require people to make an active choice to opt out of, as opposed to opt into, a desired behaviour (Johnson & Goldstein, 2003). As a default option, credit card companies could block expenditure at gambling venues and sites, and require consumers to opt out of the block by notifying their financial institution if they wish to enable gambling expenditure at certain venues or sites. Gambling operators can set
conservative deposit or money transfer limits, lower the default bet size option of a game, or send players’ winnings to a separate ‘cash out’ account, with players having to select to re-gamble their money. The potential power of defaults in gambling was shown in an online sports betting study where less than 1% of 47,000 gamblers exceeded the deposit limits imposed (Broda et al., 2008). Thus, gambling policy makers, operators, and clinicians need to be aware of setting well-designed default options to enhance desired gambling behaviour.

Other self-regulatory strategies can assist gamblers to overcome ‘present bias’, which is the tendency to make decisions that are enjoyable today, even at the expense of greater, long-term benefits (Laibson, 1997). Harm-minimisation strategies should include cues encouraging people to think about the benefits of saving funds. Several apps launched to target tobacco cessation use augmented reality to show smokers what else they could spend their money on (Lake, 2013), or show smokers a superimposed photo of how damaged their lungs are likely to be based on their cigarette consumption (“Augmented reality app shows smokers their damaged lungs,” 2011). Another approach to overcoming the discrepancy between short- and long-term preferences is the use of commitment mechanisms, such as pre-setting limits on the time and/or amount of money spent (lost) gambling (Ladouceur et al., 2012). Commitment devices can be formally binding (e.g., mandatory exclusions and limits if certain outcomes occur) or nonbinding but nonetheless psychologically powerful, such as promises to oneself to limit gambling expenditures. Planning prompts and reminders to encourage people to follow through with their preferred and pre-stated course of action can also help facilitate and enhance adherence to desired behaviour (Wohl, Gainsbury, Stewart, & Sztainert, 2013). This range of self-regulatory options highlights the potential for a behavioural ‘toolkit’ to assist gamblers in adhering to their pre-set gambling preferences in a way that works best for them.
Finally, a key element in any behavioural economic policy or program is measurement and evaluation. The best method to evaluate an intervention is through a randomised controlled trial (RCT), which is an experimental design that randomly assigns participants to a control (no intervention) or intervention group (Victora, Habicht, & Bryce, 2004). This method allows the impact of the intervention to be determined by comparing behavioural differences between the two groups. Evaluations may also include economic modelling as an additional form of analysis in addition to some of the more commonly used psychology-based methodologies. To ensure that policies and practices are cost-effective and have the desired impact, with minimal negative unintended consequences, it is essential that they are thoroughly evaluated. One common regulatory and industry objection to implementing responsible gambling initiatives is the lack of empirical evidence for many proposed interventions (Gainsbury et al., 2018; Livingstone et al., 2014). Yet, the evaluation of interventions often requires field trials and access to industry data, such as player loyalty cards or transactional data, which requires cooperation from the gambling industry. Given the conflict of interest, such data is often difficult to obtain and may require regulatory interventions. It is important that gambling operators partner with academics and policy-makers to share data and design experiments. The results from any trials should be published, including null findings, so that these can inform the development of subsequent interventions.

Conclusions

The effectiveness of policies and practices in place to minimise gambling-related harms are limited in their success. Through understanding how psychology influences decision-making, a behavioural economics approach offers promising interventions to minimise gambling-related harms across the spectrum of gambling risk. The appeal of nudging is self-evident: it proposes a
set of seemingly subtle, low-cost environmental and policy changes that can be applied to a wide range of individuals, or targeted groups (Marteau, Ogilvie, Roland, Suhrcke, & Kelly, 2011). However, in gambling, a greater evidence base is required, including both primary research and the evaluation of existing evidence where it is available. Furthermore, greater collaboration between industry, policy-makers, and academics is required. It is important to recognise the value of field testing in policy initiatives through RCTs and other experimentation methods (Etzioni, 2011). Field testing provides essential evidence on the groups, behaviours, and contexts that we want to better understand. As gamblers are a diverse group, research is needed to evaluate interventions for specific target populations.

Greater awareness of the impact of nudges and behavioural economic interventions by gambling regulators and policy-makers may lead to greater and safer regulation of game design, and enhanced gambling harm prevention and treatment initiatives. Governments can use behavioural science principles to assist individuals to gamble within their own appropriate limits. Legislation on the testing of interventions in the field should also be implemented to prevent ‘backfire’ effects, or negative consequences (Marteau et al., 2011). Where industry operators claim to have responsible gambling policies, these should be monitored to determine whether the practices are effective in achieving the desired level of safe behavioural change, as many inconsistencies in gambling have been seen (Kingma, 2015; Rowe et al., 2017). Many of the nudges described above have not been implemented or tested to minimise gambling-related harms and the impacts are unknown. Subsequently, it is essential to evaluate gambling policies to ensure efforts to minimise gambling-related harms are appropriately directed. The interventions suggested in this paper may provide useful strategies to assist in minimising gambling-related harms. Given there is increasing evidence that nudging and behavioural economic interventions
work across many health-related fields, findings from gambling could be applied to substance abuse and other behavioural addictions.

**Recommendations for a behavioural economics approach to gambling harm-minimisation interventions**

From a behavioural economics perspective, the development, implementation, and evaluation of a gambling harm-minimisation approach should:

1. Identify and measure the specific target behaviour(s), population(s), and signs of harm.
2. Consider the context or structure of the decision-making environment to identify inaccurate beliefs (biases) or behavioural barriers preventing a desired behaviour.
3. Design a choice environment that equips people with the right tools to follow through with, and adhere to, a desired behaviour.
4. Preserve autonomy and empower individuals through freedom of choice.
5. Incorporate evaluation into the implementation process, ideally via an RCT.
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