



Applying behavioural insights to design better safer gambling tools

Part 2: Commitment devices

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Who this report is for

This report details our continued work — funded by GambleAware, and supported by the Gambling Commission — to conduct trials with gambling customers of major online British operators. The report provides valuable evidence-based insights for the following groups:

- the gambling industry
- policymakers and regulators

1. The gambling industry

This trial was implemented in partnership with a leading gambling operator, bet365, who committed time and resources to the project. It is a unique attempt to implement changes to the industry-standard design of safer gambling tools, and to generate evidence on the basis of actual customer behaviour.

We urge gambling operators to give strong consideration to working on similar kinds of independent trials going forward. The Betting and Gaming Council trade body has published [commitments](#) for improving safer gambling standards, and engaging in the sorts of trials reported here could benefit operators wishing to meet the Council's commitments. Independent research will ensure that trials are evaluated robustly, can be used to inform gambling policy that is *evidence-based*, and, importantly, ensure customers are better protected against harm.

Key takeaways

- Evaluating the impacts of existing safer gambling tools, such as deposit limits, is vital. However, there is an acute lack of evidence drawn from their use in practice, and by actual customers.
- Commitments to improving these tools necessitates that more trials such as that reported here are carried out.
- We recommend that operators periodically and independently review all safer gambling tools, and identify opportunities for improvement.

2. Policymakers and regulators

All online gambling operators licensed in Britain offer customers a suite of safer gambling tools. Most offer the exact same selection, from limit setting tools, to budget calculators, to so-called 'reality checks'.¹ Yet we lack robust evaluations of the extent to which these tools benefit customers; how their designs could be improved; and how the uptake of such tools can best be supported.

The Behavioural Insights Team's trials have indicated where simple changes informed by an understanding of human behaviour can improve these tools. It is precisely these kinds of insights that are vital in light of the review of Britain's 2005 Gambling Act, part of which is expected to address improving customer care. We strongly encourage policymakers and

¹ Reality checks allow customers to set a frequency at which they will receive and see on the screen a display of the time that has elapsed since the session began. It must be acknowledged by the customer before it is removed from the screen.

regulators to consider how regular evaluations and reviews of operators' safer gambling tools can be facilitated — to demonstrate acceptable standards and foster continual improvement of customer safeguards.

Key takeaways

- The mere presence of, and access to safer gambling tools should not be taken as sufficient to maximise player protections.
- In recent years, the industry has been directly challenged by policymakers and regulators to show substantial progress in areas such as game design and advertising technology. We recommend a similar challenge is instigated towards building better safer gambling tools.

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1. Executive summary

In the period April 2019 – March 2020, the online gambling industry made £5.68bn in profits, an increase of 8.1% on the same period 2018 – 2019.¹ This was despite the industry's overall profits (14.2bn) seeing a marginal decrease of 0.6%, showing the relative strength of the online market, which remains the industry's most profitable subsector.

Deposit limit tools — which cap the amount of money customers are able to deposit each day, week or month, to their online gambling account — are offered by all licensed remote gambling companies in Britain. Such tools are aimed at helping customers to limit their spending and control their behaviour.

Our behavioural science research has shown how simple changes can influence a) how many people use safer gambling tools, and b) how people use these tools to control their behaviour.^{2,3} However, there is little research on how insights from behavioural science — evidence on human decision-making and behaviour — can be used to improve the design of deposit limit tools, and the impact of these different designs on how much people spend. Our [previous report](#) focused on the influence of numerical anchors for deposit limits, which are seemingly irrelevant numbers that become a reference point for making decisions. In this report we found that:

- a. Removing high anchors from deposit limit choices led to participants setting significantly lower financial limits.
- b. Participants who were not shown high anchors deposited less money into their gambling accounts than those who were; this difference was not statistically significant but was reasonably large, between 4% and 18%.

The trial reported here assessed whether building out the functionality of industry-standard deposit limit tools to include a 'commitment device' could impact customers' use of the tool, and their subsequent behaviour. A commitment device is a voluntary arrangement, designed to dissuade people from breaking their intentions (see pg. 15 for a detailed explanation and example).

This report is Part 2 of a series and details the findings from one of two trials the Behavioural Insights Team (BIT) has conducted under Phase 2 of the Remote Interventions programme commissioned by GambleAware. Part 1 of this series details the findings from the first of these two trials and was published in [January 2021](#).

Project Background ([Chapter 2](#))

From a behavioural insights perspective, choice architecture (i.e. the effect of how a choice is presented on subsequent choices) is one of the key factors that influences decision-making. Across our work, we have advanced our understanding of how the kinds of choice contexts presented to customers of online gambling platforms could shape behaviour.

The research question underpinning this trial (and that in Part 1 of our work) was whether applying behavioural insights to the design of deposit limit tools would affect if participants set a limit, the kinds of limits people set, and their subsequent gambling behaviour.

How behavioural insights can inform the design of deposit limit tools (Chapter 3)

BIT’s previous research found that people who gamble online can enter so-called psychological ‘hot’ states, which could precipitate risky behaviour.⁴ On the other hand, when setting a deposit limit, customers may be in a comparatively more ‘cold’ state. This may give rise to a gap between intentions (when in a cold state), and behaviour (in a hot state).

This ‘intention-behaviour’ gap is a common phenomenon, and one which behavioural science indicates can be overcome through the use of commitment devices.⁵ Here, the individual puts something in place to create a sense of accountability and avoid breaking their intentions.

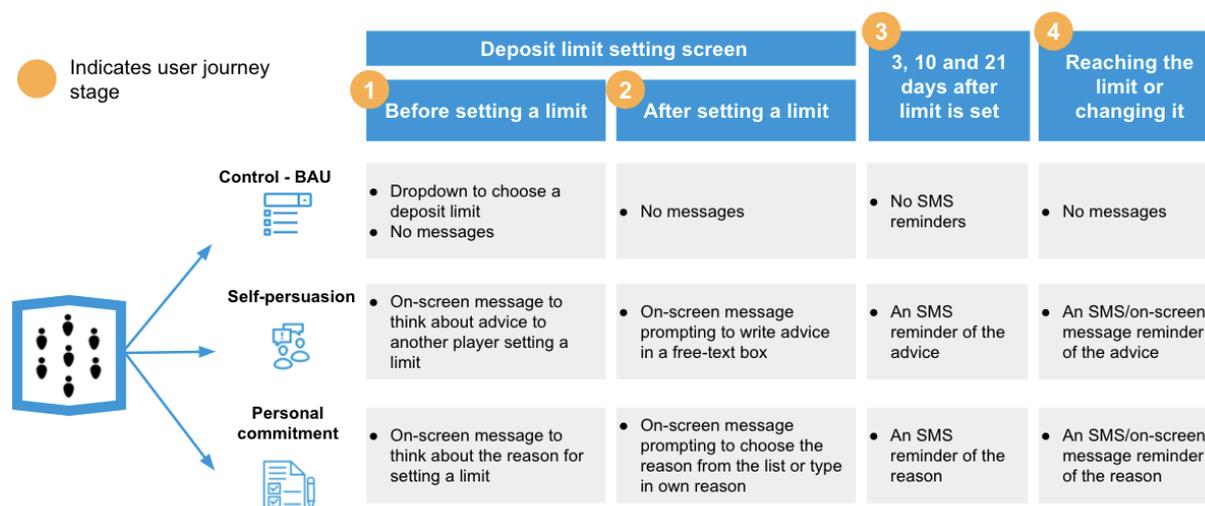
Typically commitment devices entail ‘harder’, more tangible outcomes (e.g. a financial penalty). However, as this was not possible for the current trial, we instead tested whether relatively soft commitment devices — such as reminding customers about why they set a limit — would affect gambling behaviour.

The trial we conducted, and our key findings (Chapter 4)

Our trial saw 23,592 bet365 customers currently without deposit limits receive up to three on-site pop-up notifications inviting them to set a deposit limit, with some also receiving an email solicitation. Recruitment took place over August and September 2020. 861 (3.6%) customers opted to set a limit.

All 23,592 customers were randomised into one of three trial groups, as detailed in the below image:

Figure 1. Overview of commitment trial arms.



Customers in the control group received the ‘business-as-usual’ deposit limit setting process, whereby customers select a limit from a dropdown list of denominations. Customers in the remaining two groups still selected their limits in this way. Those in the ‘self-persuasion’ group

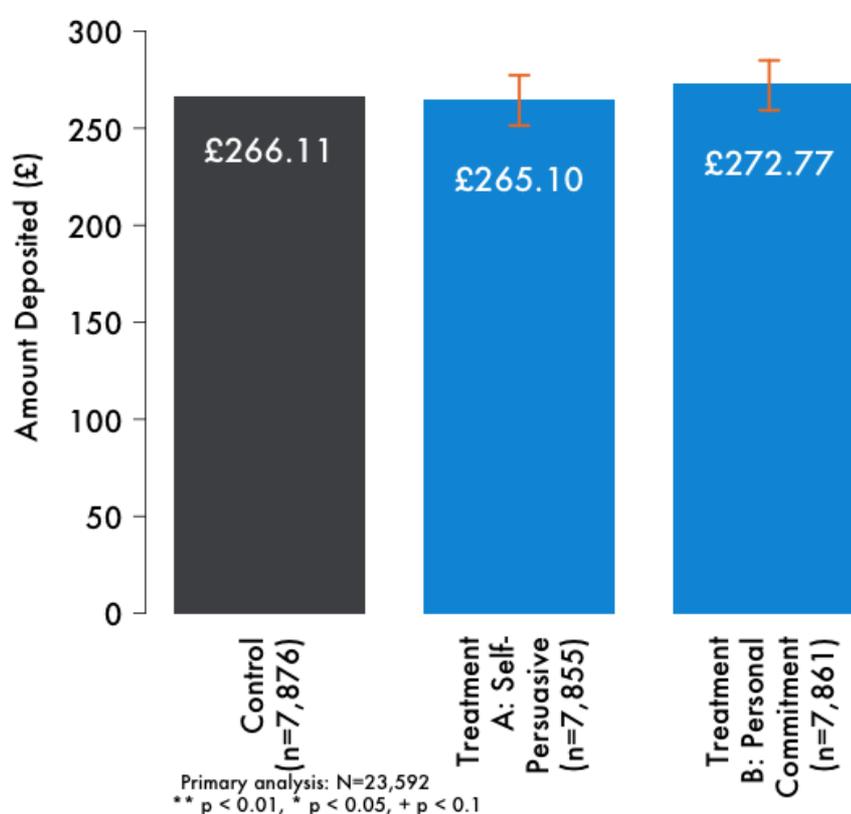
were also invited to reflect on what advice they would give to someone else who is setting a limit, and to input a message. Customers in the 'personal commitment' group were invited to select a reason why they were setting a limit. Customers in both of these groups subsequently received reminder SMSs of their chosen reason, or advice.

Two primary outcome measures were assessed:

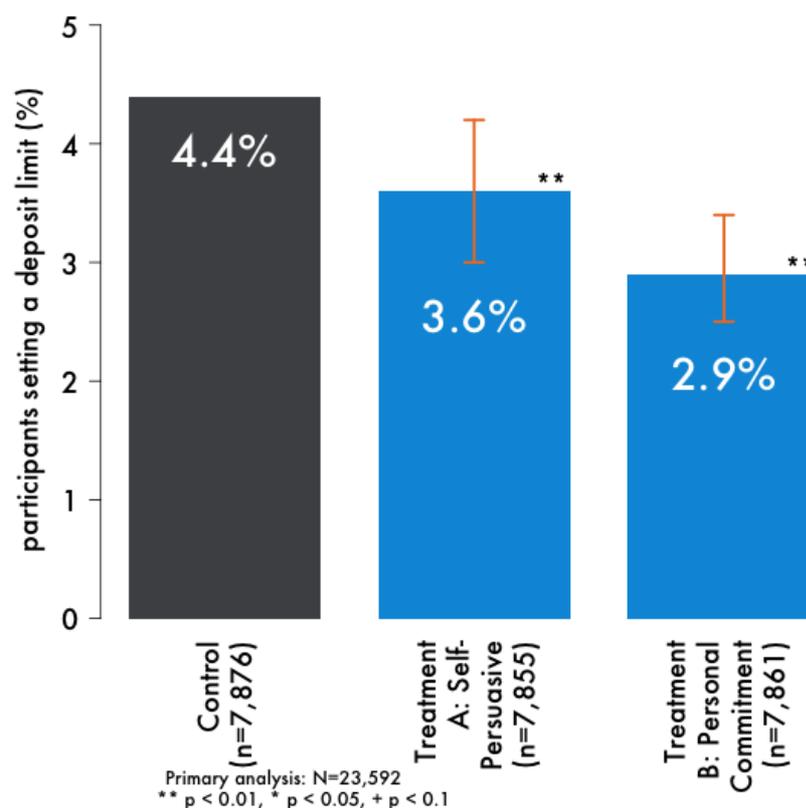
- 1) The amounts deposited by customers in each group after setting a limit, and
- 2) The proportion of customers opting to set a limit in each group.

For the first outcome (Figure 2), we observed no statistically significant differences in amounts deposited between the groups, meaning there was no evidence that either treatment had an effect on amounts deposited.

Figure 2. Amount deposited in the 30 days following intervention, for each treatment group, controlling for gender, age and pre-intervention gambling behaviours.



For the second primary outcome (Figure 3), our analysis indicated that significantly fewer customers opted to set deposit limits in each of the two intervention arms. This indicates that the intervention had an apparent 'backfire' effect within the context of this trial.

Figure 3. Proportion of participants setting deposit limits.

Our secondary, and exploratory analyses also found very little evidence to suggest that the interventions affected other play-based outcomes such as total stakes, or amounts won/lost in the 30 days subsequent to a customer having set a limit.

Our trial encountered a number of limitations and constraints, primarily that a low level of customers (<4%) opted to set a limit. **Our final sample is thus unlikely to have reflected the characteristics of the overall bet365 customer base (see [4.4.1](#) for further details).**

Key reflections, and next steps ([Chapter 5](#))

Within the context of this trial, the interventions we trialled reduced the number of customers who chose to set a deposit limit (Figure 3). This apparent backfire effect could be due to the fact that, in a number of possible ways, our trial added friction (physical and psychological barriers) to the process of setting a deposit limit. For example, customers in the treatment arms were presented with additional information to read, and choices to make. Asking customers to reflect on limit-setting motivations may have triggered an aversive emotional response, and/or the use of SMS messaging may have been off-putting.

While we did not find evidence of a positive effect of this type of commitment device on the use of deposit limits, people in the intervention groups who did take up the deposit limit did set lower deposit limits, though this finding does have some limitations, which are discussed in section 4.

In light of low uptake, and limited evidence of effectiveness, there remains a question of whether industry standard tools are helping customers to control their gambling. There are a number of potential avenues for future behavioural science research to consider:

1. **Helping customers to set meaningful limits:** customers set high limits in both of our deposit limit trials, often amounting to thousands of pounds. There remains an open and important question around how customers decide on the size of their chosen limit, and if customers could benefit from guidance on setting limits that offer sufficient protection without feeling restrictive.
2. **Evaluating when to solicit limit setting behaviour:** online gambling customers are generally asked to consider setting a deposit limit when newly registered. Future research could investigate whether prompts at other salient touchpoints could increase limit uptake.
3. **Reframing deposit limits to increase their uptake:** although many perceive deposit limits to be useful, they are also widely regarded as only applicable to people experiencing problematic gambling issues. Opportunities to reposition deposit limit tools using behavioural insights should be explored, such as reframing these tools away from implicit restriction — which may be construed as a loss of control — towards a more attractive proposition, like ‘safety net’.

Overall, we are encouraged by the potential we have seen across our work for researchers to collaborate with industry. Our trials have given rise to a number of key reflections for further work of this nature, and for the role of policymakers.

- **Key reflections for policymakers:** innovations in safer gambling tool provision have not kept pace with other areas of product development. We recommend that the regulator calls on the industry to show innovation in their safer gambling tool designs.
- **Key reflections for industry:** there remains a paucity of evidence on the impacts of safer gambling tools on British gamblers’ behaviours. Robust trials necessitate being able to recruit from the most representative samples of gambling customers possible. For example, the inclusion of both new and existing customers.
- **Key reflections for researchers:** gambling operators are receptive to carrying out independently led randomised controlled trials. However, be aware that seemingly simple changes to an operator’s site require substantial lead time to implement and a clear specification for an experiment/trial is needed upfront.

2. Project background

Chapter summary

- Choice architecture is the idea that how choices are presented to people can exert strong influences on decisions.
- BIT has evaluated major online gambling operators' websites and identified several opportunities for changes in choice architecture, and other behavioural design factors to encourage safer gambling.
- Our previous trials with major online operators have generated significant insights in terms of 1) uptake of safer gambling tools, and 2) setting of deposit limits, all through simple and easy-to-implement changes informed by behavioral science
- The current report, and accompanying Part 1 published in January 2021, detail our attempts to conduct more ambitious trials using behavioural insights to redesign and test safer gambling tools.

2.1 About this project

This research was commissioned as part of Phase 2 of GambleAware's ongoing Remote Interventions programme. The overall aim of this programme is to produce evidence and insights that identify how online gambling operators might reduce risky gambling behaviour. In Phase 1 of this programme, the Behavioural Insights Team (BIT) highlighted potential behavioural design flaws in how safer gambling tools tend to be offered to customers. For example, they can often require several clicks to access, requiring more effort on the end-users part.⁶

For Phase 2, BIT set out to build on Phase 1 by conducting two large trials in a live business environment with a major UK gambling operator, bet365. The objective of this work was to produce evidence around specific ways that deposit limits — a type of safer gambling tool explained further in chapter three — should be applied so that they can better protect people.

This report details the second of our two trials, conducted over the summer of 2020. In this report we describe our experimental work, its findings, and insights from our experiences working with the industry and gambling customers.

Note: This report is Part 2 of 2 on our experimental trials with UK online gambling operators. Part 1 of this report, which details our first trial on deposit limits, is available [here](#). Part 1 also provides further background context on the extent of gambling, and gambling harms in the UK.

2.2 A brief history of applying behavioural insights to gambling

2.2.1 *Understanding the choice architecture of online gambling*

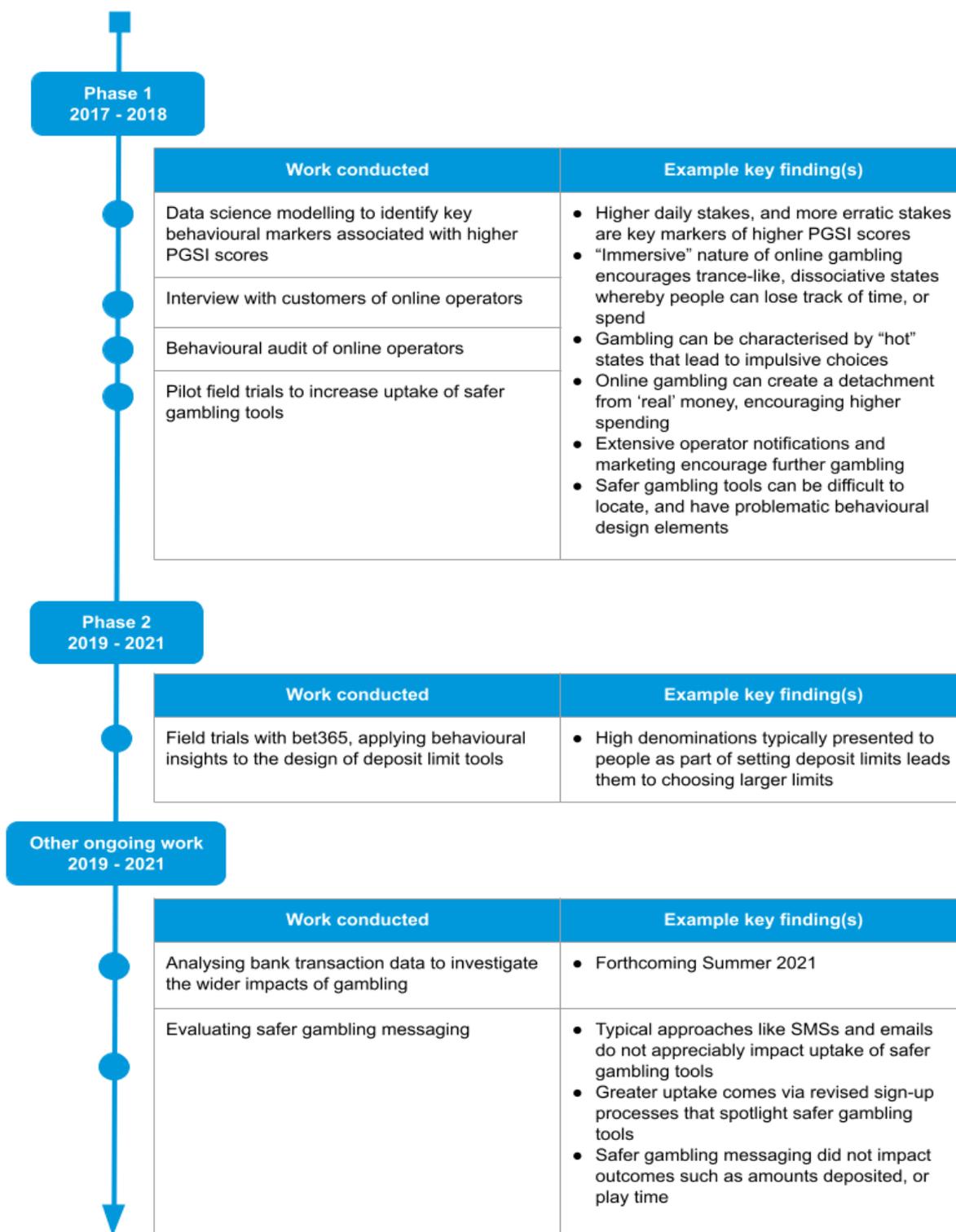
From a behavioural insights perspective, *choice architecture* is one of the key factors that influences decision-making. Put simply: the ways in which a choice is presented, from the options offered, to how people functionally make their choice, can drive the choice that is then made.⁷

By identifying the ‘journey’ that a person goes through when they interact with an online gambling platform, we can begin to map where certain choice design elements could have a bearing on decision-making. In Phase 1 of GambleAware’s Remote Interventions programme, we sought to map out such customer journeys and speak directly to customers who use online gambling platforms. This informed our approach to the trials we have conducted as part of this Phase 2 research.

In this section we review briefly how our research has progressed, and how it has advanced our understanding of how the kinds of choice contexts presented to customers of online gambling platforms could shape behaviour.

Figure 4, below, presents an overview of BIT’s work to date targeting how to promote and increase safer gambling in Britain.

Figure 4. Timeline of BIT’s research to date applying behavioural insights to safer gambling²

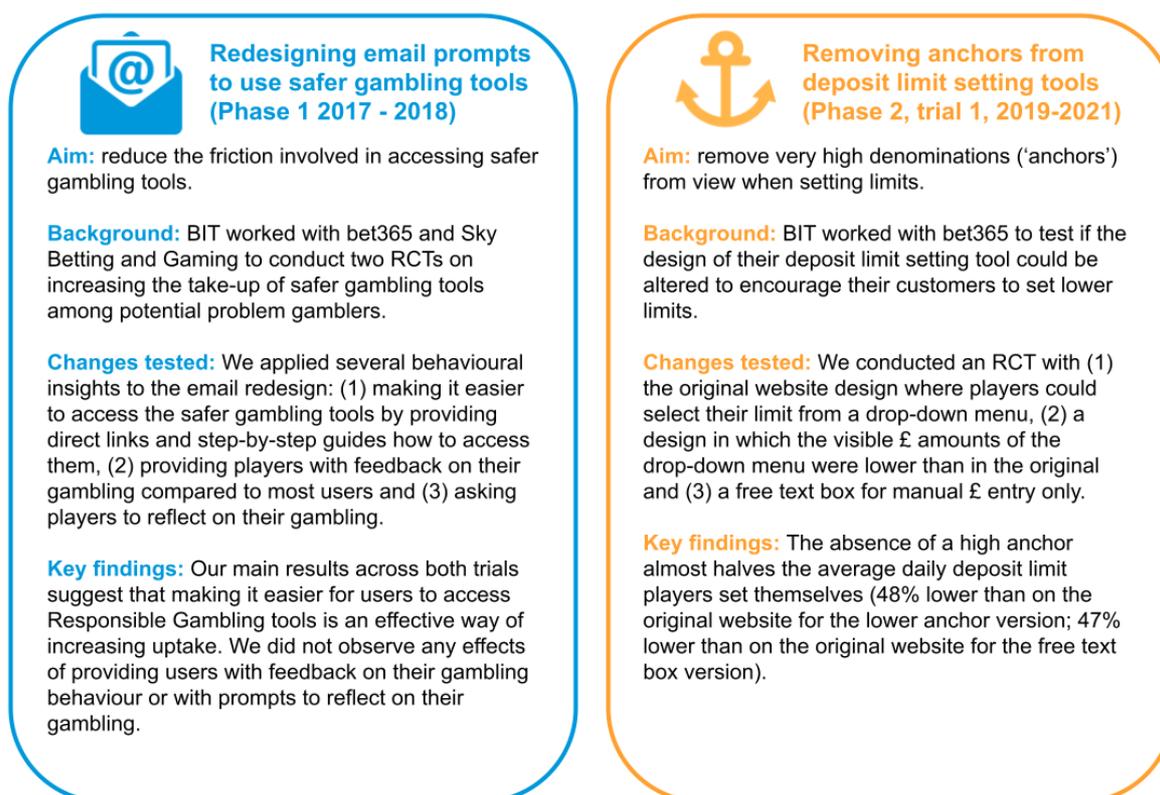


² N.B. Problem Gambling Severity Index (PGSI) measures the degree to which a respondent experiences negative consequences as a result of gambling. It consists of 9 items, on a 4-point scale. Scores can range from 0 to 27, with a result of 8+ indicating gambling with negative consequences and a possible loss of control.

2.2.2 Testing changes to choice architecture in online gambling: our previous work on the Remote Interventions programme

Our changes are ultimately aimed at changing core elements of the choice context faced by customers wishing to use safer gambling tools. Figure 5 summarises the randomised controlled trials (RCTs) we have run to date. This work uncovered how small changes to the online gambling environment can positively impact the design and uptake of safer gambling tools. For more detail on each of these studies, please refer to our reports [here](#) and [here](#).

Figure 5. A brief overview of BIT's previous trials on the Remote Interventions programme. This includes Phase 1 in 2017-18 (blue box) and Phase 2, trial 1 in 2019-2021 (orange box)



Throughout these trials, we have observed clear evidence that simple, cost-free changes to choice contexts can have demonstrable impacts on behaviours displayed by gambling customers. In doing so, our ultimate aim is to reduce the likelihood of a person experiencing gambling harm.

In our final trial for this project, which is the focus of this report, we set out to evaluate the potential impact that another well-established behavioural tool might have on how people behave when setting deposit limits: namely commitment devices.

3. How behavioural insights can inform the design of deposit limit tools

Chapter summary

- Deposit limit tools cap the amount of money people are able to deposit in a given time period.
- Despite the prevalence of deposit limit tools, little is known about how their design may influence how people use them.
- Insights from behavioural science may offer guidance as to how these tools could be adjusted to improve their effectiveness.
- For example, building soft 'commitment devices' into the limit setting process could assist people in staying in control of their gambling behaviour.
- We conducted one of the first trials of its kind with a UK operator to determine if embedding commitment devices into the limit-setting process could impact peoples' limit-setting behaviour positively (e.g. by setting lower limits, or spending less after setting a limit).

3.1 Deposit limit tools: What opportunities are there for behavioural insights?

Monetary limits are the most widely used form of safer gambling tool.^{8,9,10} In [Part 1](#) of our work we summarised the theoretical foundations and empirical evidence around the effectiveness of deposit limit tools. In short, the evidence is mixed but promising and would benefit from further exploration. As many as 60% of those who use monetary limits report finding them helpful and/or feeling more control over their gambling behaviour.^{11, 12,13}

However, even though participants self-reported positive feelings towards the use of these tools, within our research and previous external studies several potential flaws of their usage have been identified. The two most significant are:

- **People setting limits that are higher than they can afford to lose:** our most recent trial found that the median customer limit was £100 per day, despite this level of expenditure being more than most people's disposable income. We found that when gambling operators removed very high denominations from the pre-set options, customers set limits that were 50% lower. Research from NatCen and the University of Liverpool also found that in cases where limits were set, over one third were >£50,000 monthly equivalent.¹⁴
- **People do not stick to the limits they set themselves:** as many as 45% of users fail to stick to their self-imposed monetary limits. Survey-based research of Canadian gambling customers shows that gamblers who had self-determined limits in mind spent on average four times more than this in a month.¹⁵

Exceeding a monthly limit by \$100 — as did 45% of customers in the Canadian trial cited above — was an important predictor of higher gambling harm risk, as measured by the

Problem Gambling Severity Index (a widely-used tool to assess pathological gambling among the general population). This same research, and other research on deposit limits conducted in Australia found that this overspending and harm relationship is especially strong for higher spenders.¹⁶

There are myriad psychological and situational factors that may explain why people fail to stick to their monetary limits.¹⁷ For instance, when setting limits, little guidance is given to the customer around what level of limit to set. While some online operators provide customers with profit/loss tools detailing their expenditure, it is not the case that this information is used by operators to suggest reasonable limits. An additional factor affecting deposit limit efficacy is changes in a customer's mental state (outlined in detail in Section 3.2 below.)

Our Phase 1 research gave us insights on the kinds of psychological states customers find themselves in. In Phase 2, we designed a new intervention aimed at closing the 'gap' between how people are likely thinking and feeling when setting limits vs. how they may think and feel when immersed in a gambling session.

3.2 Intention-behaviour gaps, and how commitment devices can mitigate them

For better or worse, our feelings are often a key force in risk taking behaviour.¹⁸ Knowledge about how individuals are influenced by their emotions, motivations and the context they find themselves in is crucial to understanding the fundamental drivers of behaviour.

While gambling customers may start with strong intentions to keep their gambling controlled, these intentions are often formed in a relatively 'cold' state. These states are characterised by clearer thinking, as decisions are not being influenced by elevated emotions or feelings. Our past qualitative research involving interviews with gambling customers showed that they can experience so-called 'hot states' during intense periods of gambling.¹⁹ Psychologically, a 'hot' state is akin to being under acute stress: a period of high mental arousal that can constrain our ability to make rational decisions; such states could compromise peoples' ability — or intentions — to stay within intended limits.²⁰

The negative consequences of hot states on behaviour can compound a further psychological barrier that often keeps us from staying true to our intentions: the so-called 'intention-behaviour gap' (Figure 6).²¹

Figure 6. The intention-behaviour gap: An illustrative example.

Why does the intention-behaviour gap arise?

The ice cream truck can be difficult to resist if it is an **unexpected** temptation, especially if arising in an **stressful** moment, such as after an intense workday. Stress can **deplete our self-control**, meaning we are more likely to give in without thinking too much about our prior intentions.

While many people *intend* to start new exercise regimens as part of their New Year's resolutions, for example, they may struggle to maintain this beyond a few weeks. Psychologically, one of the key reasons why this 'intention-behaviour' gap exists is a failure to build consequence or accountability into our intended plans, thereby making it easier for us to disengage from our planned course of action. Psychologically, hot states further complicate this. What can be done, then, to try and head-off our hot states from undermining our behavioural intentions?

A 'commitment device' can mitigate the behavioural aspects of this type of problem, and help people stick to their goals. As outlined below, a commitment device is an arrangement entered into voluntarily by an individual that sees them put in place measures designed to dissuade them from breaking their intentions. Like a form of behavioural insurance policy, it recognises that we may find ourselves in situations (like unplanned hot states) that could derail us. A commitment device generally takes the form of a penalty for non-compliance, and can be purely psychological (a 'soft' commitment) or a real economic one (a 'hard' commitment).²²

Examples of commitment devices

In one randomised control trial, smokers were randomly offered a savings account to deposit funds into for six months. If they did not pass a nicotine and cotinine test at the end of the period, their accrued money was given to charity. Smokers who were offered this commitment arrangement were more likely to pass the test than those who were not.²³

This was an example of a 'hard' commitment device involving financial costs. In another study, 'soft' commitments were shown to be more effective at helping people increase their savings than 'hard' commitments or no commitments at all.²⁴ Here, the soft commitment was that people were merely asked to think about their savings goals — how it would feel to achieve them - and make a pledge to work towards these goals.

The popularity and effectiveness of commitment devices in helping people stick to their intentions has seen a growing number of online services which help people follow through with their everyday goals, such as [stikK](#) and [Beeminder](#).

3.3 Using commitment devices to reduce the risk of gambling-related harm

Leveraging customers' 'cold states', then, when intentions are at their strongest, could offer an opportune and timely moment to encourage them to use a commitment device to further help people control their behaviour. Subsequent reminders of these commitments, and why the person agreed to them, could potentially disrupt 'hot states' and help reduce risky play.

In the online environment, there are some ready-made commitment tools available to users, such as [Gamstop](#) — a cross-platform free self-exclusion tool which blocks the user from accessing all British-regulated online operators for periods ranging from six months to five years. If the person tries to access a gambling operator from the list, the operator will check whether they have self-excluded and block their access. Users cannot deactivate the self-exclusion before the end of the minimum exclusion period.

Another example is [Gamban](#) — software for blocking gambling websites and apps across users' devices. Users cannot uninstall the software until their subscription expires, with exclusion periods ranging from one month to five years.

A number of banks in the UK also offer their customers different gambling blocking functions.²⁵ For example, Monzo customers can switch on a [block on gambling transactions in the app](#). To turn off the block users need to speak to a member of the customer support team first which should add additional friction to exiting the commitment. In addition, there is a 48-hour cooling off period after the conversation, before the block can be switched off.

There is limited research on the use of such pre-commitment devices. However, the data available suggests that uptake of self-exclusion tools is very low (two operators involved in past BIT research reported a 0.1% and a 6% uptake).²⁶ Other research has found self-exclusion tool uptake is 2.3%, based on British account data from seven major operators; notably, uptake was often found to occur after incurring financial loss.²⁷ Therefore, it is important to increase uptake of these existing tools but also to develop further commitment tools that could be offered on the gambling platform directly.

This trial focused on testing a new commitment device that differed to the exclusion tools already available to gamblers, and by doing so, strengthen the impact of an existing deposit limit tool. Our intervention thus comprised something that could be added in to deposit limit tools as they exist, rather than create a new, separate tool. This involved emphasising the benefits of commitment devices that are introduced at the stage of setting a deposit limit to facilitate safer gambling. Our original intention was to trial a 'hard' commitment device with a tangible and psychological cost: breaching a deposit limit would trigger a message to a third-party (e.g. a friend, or colleague) nominated by the customer. However, the operator confirmed that implementing such an intervention would be infeasible in terms of the technical

development necessary. Instead, we tested relatively softer commitment devices, such as choosing or writing a personal reason for setting a limit. We believe that not wishing to fail to adhere to one's personal commitment, for example, could still impose a psychological cost that drives people to comply with their limits.

4. The trial we conducted, and our key findings

Chapter summary

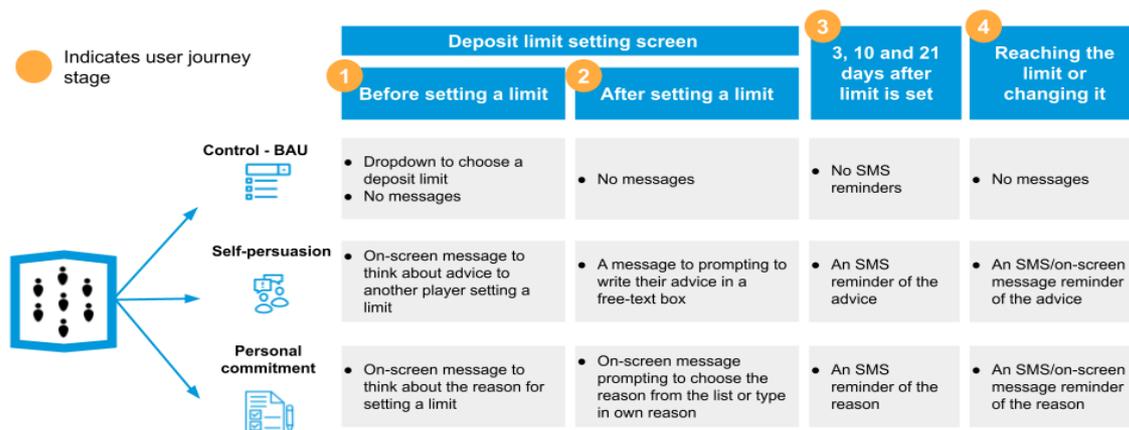
- The trial compared a business-as-usual deposit limit design against two treatment versions with added commitment device functionality.
- Between August and September 2020, N=23,592 bet354 customers were solicited to set a limit. 861 opted to set a deposit limit in response to an on-site pop-up notification and/or email invitation.
- We observed a small difference, but not statistically significant, in the amounts deposited by customers after setting a limit.
- However, we found significantly fewer customers opted to set deposit limits in each of the two intervention arms (A: 3.6%, B: 2.9%) versus the control (4.4%).
 - o The customers that did set limits were more likely to set lower limits than the control group, although caution is required when interpreting the findings.
- Our trial encountered a number of limitations and constraints, primarily that of the overall low levels of customers (<4%) opting to set limits when invited to.

4.1 The interventions we tested

We investigated the impact of additional functionality presented when customers are choosing to set up a deposit limit. The business-as-usual deposit limit (BAU) was compared against two treatment arms: 1) encouraging customers to write a message giving advice to another player setting a limit, which was then used as a self-persuasion tool after they had set their own limit, and 2) encouraging customers to set a personal reason for why they are setting a limit. Note that we use terms such as ‘intervention’, and ‘treatment’ interchangeably to refer to where participants received one of the two novel versions of the deposit limit tool in the trial.

For both treatment arms, customers received reminders (served as SMS messages) about their deposit limit, and their commitment device, at set periods.

Figure 7. Overview of trial arms.



In all treatment arms customers could choose a deposit limit for up to three different time periods — 24 hours, 7 days, and/or 30 day — by selecting an amount from a dropdown menu that offered a list of increasing denominations (see Figure 8, below).

The first major difference between the BAU and each of the two treatment arms was the inclusion of additional on-screen messages. Figure 8 below illustrates where the additional messages appeared visually on-screen relative to the standard BAU deposit limit screen, with Stage 1, and Stage 2 being drawn from Figure 7, above.

Figure 8. BAU deposit limit screen, and indications of where treatment arms added additional on-screen messages.

The screenshot shows the 'bet365 MEMBERS' website interface. At the top, there is a navigation bar with links for 'Bank', 'My Account', 'History', 'Bet Credits', 'Responsible Gambling', and 'Messaging'. Below this is a 'Deposit Limits' section. The text explains that users can limit their deposits on a 24-hour, 7-day, or 30-day basis. It also states that limits can be revised downwards at any time, but increases are only implemented 24 hours after a request. A section titled 'Your existing deposit limits are:' lists three categories: '24 Hour', '7 Day', and '30 Day', each with a 'Please select' dropdown menu. Below these is a 'Password' field and a 'Submit' button. Two orange circles with numbers '1' and '2' are placed on the screen. Circle 1 is next to the text 'Stage 1 prompt appeared here' and points to the area above the dropdown menus. Circle 2 is next to the text 'Stage 2 prompt appeared here' and points to the area above the password field.

In the ‘self-persuasion’ treatment arm, limit-setting customers were invited to consider what advice they would give to someone else who had opted to set a limit. The first additional on-screen message people saw was (Stage 1, Figure 8 above):

‘Before you set a deposit limit, why not take a moment to think about the advice you would give to someone else who is setting a deposit limit?’

Customers were then asked to write down the advice in a free text box; no pre-set options were provided (Stage 2, Figure 8). There is evidence that encouraging people to take a third-person perspective helps people formulate better suggestions for their own personal goals.²⁸ Moreover, evidence shows that self-generated advice produces powerful and long-lasting behaviour change.²⁹

Asking customers to reflect on their reasoning when setting a deposit limit was intended to take advantage of customers still being in a ‘cold state’, when able to reflect more carefully on their current behaviour. We also sought to separate out the question of ‘why’ customers were setting a limit from whether a limit should be set. Presenting such choices separately, rather than combined into a single choice, can influence decision making.³⁰

In the ‘personal commitment’ treatment arm, customers who set a deposit limit were asked to reflect on their reasoning for setting a limit. On the deposit limit screen (Stage 1, Figure 8), there was an additional on-screen message inviting people to think about why they wanted to set a limit:

‘People use deposit limits for lots of different reasons. Why not take a quick moment to think about why you are setting a deposit limit?’

The next key difference in the ‘personal commitment’ treatment arm compared to the BAU deposit limit tool was that customers were asked to choose a reason as to why they were setting a limit (Stage 2, Figure 8). A list of pre-set reasons were offered, which were based on findings from BIT’s prior qualitative research.³¹ Options in the dropdown list included common reasons, such as ‘A deposit limit will help me stick to my budget’ and ‘I want to spend less time playing’.

The full list of reasons and all other messages displayed at different stages of the user journey are in Appendix A1. Customers also had the option to enter their own chosen reason via a free text box.

Customers in each of the two treatment arms subsequently received SMS text reminders containing the text of either their chosen personal commitment, or the text of the advice they would give to a third party (Stage 3, Figure 7). Reminders were sent 3, 10, and 21 days after the limit was set. We opted for this schedule on the basis that weekly reminders have been found to be more effective at achieving behaviour change than less frequent reminders.³² Below is an example of the reminder text sent after 10 days.

‘Hi [customer first name]. Just a quick reminder that your advice to someone setting a deposit limit was to [stated advice]. Text STOP to XXXXX.’

Reminders were also served when customers tried to make deposits that exceeded their limit, and when they tried to change their limit (Stage 4, Figure 7). The full list of messages displayed to customers in both treatments at different stages of their user journey are in Appendix A.1.

4.2 Trial implementation

A total of N=23,592 bet365 customers currently without deposit limits were targeted for inclusion in the trial, with recruitment taking place between August and September of 2020. This sample represented the full extent of the customers made available by bet365 for the trial, and comprised existing customers (as opposed to newly-registered customers), and customers who had previously opted in to SMS marketing from bet365. We discuss these limitations further in Section 4.4.

Following the same process as in our previous anchoring trial, each of the 23,592 customers received a series of prompts inviting them voluntarily to set a deposit limit. Prompts included pop-up messages appearing on-screen when customers logged into their bet365 account. One such prompt was served per week up to a maximum of three. Additionally, customers who did not set a deposit limit within two days of seeing the first pop-up also received an email

prompt to do so, followed by two subsequent login prompts. Only customers who opted not to set a limit saw all of the prompts. Images of these prompts can be found in Appendix A.1.

Any customer from this N=23,592 who navigated to the deposit limit screen was randomised into one of the three trial arms described in Figure 7 (pg.20). Data was captured for customers who opted to set limits, irrespective of whether they also opted to engage with the commitment device intervention. Additionally, not all customers who received prompts will have navigated to the deposit limit screen, while some may have but nonetheless opted not to set a limit. Figure 8 (pg. 21) shows the bet365 business-as-usual deposit limit screen. Figures 9 – 12 below shows the two redesigned variants tested alongside this. Note that in the case of each of the intervention arms, customers were not required to set personal commitments, or provide any self-persuasion advice; customers were free to set deposit limits without engaging with the additional aspects of the trial materials.

Figure 9. Redesigned ‘self-persuasion’ treatment arm of the deposit limit tool tested in the trial.

The screenshot displays the 'bet365 MEMBERS' interface. At the top right, there is a 'Contact Us' section with links for 'Live Chat', '08000 288 365', 'Email', and 'Web Message'. Below this is a navigation menu with 'Bank', 'My Account', 'History', 'Bet Credits', 'My Gambling Controls' (highlighted), and 'Messaging'. The main content area is titled 'Deposit Limits' and contains the following text and form elements:

This facility enables you to limit the amount of money that you are able to deposit online into your account on either a 24 hour, 7 day and/or 30 day basis.

These amounts may be revised downwards at any time but any increase will only be implemented 24 hours after the request. Our Customer Services staff will be available to provide any further information required but are unable to override limits set by you.

Your existing deposit limits are:

Before you set a deposit limit, why not take a moment to think about the advice you would give to someone else who is setting a deposit limit?

24 Hour

Please select

7 Day

Please select

30 Day

Please select

Password

Feel free to write a sentence or two in the box below on the advice you would give to someone else who is setting a deposit limit.

I would advise this person to

We will remind you of this reason by text message from time to time. To stop receiving text messages, simply return to this page and select 'Don't remind me'. Alternatively, text STOP to 85385

We will check statistics to see if writing some advice can help people stick to limits. This is part of bet365's ongoing efforts to promote safer gambling.

Figure 10. Redesigned ‘self-persuasion’ treatment arm of the deposit limit tool tested in the trial — Screen if customer selects to amend reason.

Update Reason

Feel free to write a sentence or two in the box below on the advice you would give someone else who is setting a deposit limit.

I would advise this person to

Submit

Cancel

Figure 10 shows that customers who had opted to enter a free-text response (inclusive of the personal commitment, and self-persuasion arms), had the opportunity to later amend their reasons if they so wished.

Figure 11. Redesigned ‘personal commitment’ treatment arm of the deposit limit tool tested in the trial.

bet365 MEMBERS

[Contact Us](#)
[Live Chat](#) | [08000 288 555](#) | [Email](#) | [Web Message](#)

Bank
My Account
History
Bet Credits
My Gambling Controls
Messaging

Deposit Limits

This facility enables you to limit the amount of money that you are able to deposit online into your account on either a 24 hour, 7 day and/or 30 day basis.

These amounts may be revised downwards at any time but any increase will only be implemented 24 hours after the request. Our Customer Services staff will be available to provide any further information required but are unable to override limits set by you.

Your existing deposit limits are:

People use deposit limits for lots of different reasons. Why not take a quick moment to think about why you are setting a deposit limit?

24 Hour

Please select
▼

7 Day

Please select
▼

30 Day

Please select
▼

Password

Below are some common reasons for setting a deposit limit. If none of these seem right, feel free to type your own in the box below.

Please select
▼

We will remind you of this reason by text message from time to time. To stop receiving text messages, simply return to this page and select 'Don't remind me'. Alternatively, text STOP to 65365

We will check statistics to see if adding a reason can help people stick to limits. This is part of bet365's ongoing efforts to promote safer gambling.

Submit

Cancel

Figure 12. Redesigned ‘personal commitment’ treatment arm of the deposit limit tool tested in the trial — ‘Other’ reason.

bet365 MEMBERS Contact Us
Live Chat | 0800 288 365 | Email | Web Message

Bank My Account History Bet Credits My Gambling Controls Messaging

< Deposit Limits

This facility enables you to limit the amount of money that you are able to deposit online into your account on either a 24 hour, 7 day and/or 30 day basis.

These amounts may be revised downwards at any time but any increase will only be implemented 24 hours after the request. Our Customer Services staff will be available to provide any further information required but are unable to override limits set by you.

Your existing deposit limits are:

People use deposit limits for lots of different reasons. Why not take a quick moment to think about why you are setting a deposit limit?

24 Hour

Please select

7 Day

Please select

30 Day

Please select

Password

Below are some common reasons for setting a deposit limit. If none of these seem right, feel free to type your own in the box below.

Other

I am setting a deposit limit because

We will remind you of this reason by text message from time to time. To stop receiving text messages, simply return to this page and select 'Don't remind me'. Alternatively, text STOP to 85385

We will check statistics to see if adding a reason can help people stick to limits. This is part of bet365's ongoing efforts to promote safer gambling.

Submit

Cancel

Figure 12 shows that customers in the personal commitment arm could also opt to set their own reason via free text, should they wish.

4.3 Our findings

As is standard for BIT trials, our analysis aimed to explore a range of primary, secondary, and exploratory outcomes, which we define as:

- **Primary outcomes** are those which provide the headline results of the trial
- **Secondary outcomes** are those which are of more peripheral interest relative to the primary outcomes
- **Exploratory outcomes** are those which are not directly related to the trial's research questions, and unlike the primary and secondary outcomes are not necessarily specified beforehand

This trial had the following primary outcomes:

1. The amount participants deposited in the 30 days following the intervention
2. The amounts of people in each group opting to set a limit, and the average size of those limits

4.3.1 Trial sample considerations

Of the 23,592 customers who received a prompt to set a deposit limit, 861 customers (3.6%) opted to set a deposit limit. Relative to those customers who opted not to set limits, limit setters:

- were significantly more likely to be male (87.8% vs. 84.3%)
- were significantly older (mean age of 45.7 years vs. 39.1 years)
- deposited significantly more during the 30 days before trial start (£982.55 vs. £264.36); and
- staked significantly more during the 30 days before trial start (£3,921.43 vs. £959.36). Of the 513 of these 861 customers in the treatment arms, a total of 181 (35.3%) both set limits *and* engaged with the commitment device intervention.

As with our previous anchoring trial, we observed very low uptake of the offer to set a limit. Such a small sample reduces the 'statistical power' of the trial, meaning that only large impacts are likely to be detectable. We discuss this as a limitation in Section 4.4. Full details on the power calculations conducted for the trial are given in Appendix A2. The randomisation of customers across the three trial arms produced groups balanced on age and gender. Further details on these checks are found in Appendix A2.

The observation period (during which data relating to the outcomes was collected) began alongside presentation of the initial prompt to set a deposit limit, and ran for 30 days thereafter. Below we describe the key findings per the trial's two primary outcomes, and also detail other salient findings arising from secondary or exploratory measures which are detailed more fully in Appendix A3.

How we present findings

To aid comparison and interpretation we typically present our key findings in the form of graphs, with fuller specifications of the statistical analyses underpinning the findings provided in the appendices.

In our graphs we display:

- a) For the control group, the actual observed result;
- b) For the treatment groups: a statistical estimate of what would have happened to the control group if we had treated it, based on the observed data (in some instances, it may also be necessary to transform the observed data for the purpose of computing the estimates, which we then back-transform for the purpose of the graph.) This means that the graphs often show estimated values for the treatment groups that are

different from the observed values for those groups. However, this merely reflects the fact that the estimated values control for demographic differences. In a randomised controlled trial, these differences are generally small.

All participants who were randomised into either treatment arm were exposed to at least part of the intervention, namely the additional text added to the deposit limit selection screen as referenced in Figures 9 and 11 on pgs. 23 and 24. This additional text could in principle have affected customers' behaviour, even if they did not opt to choose a personal commitment, for instance.

It is also worth noting that not all customers in the treatment arms who set a deposit limit completed the commitment device exercise — further details are given in Table 1 below. Take-up of the commitment device among those who set a deposit was much higher in treatment arm B compared to treatment arm A — 62.8% compared to 12.8%.

Table 1. Number of limit-setting customers in each treatment arm who also engaged with the commitment device.

Treatment arm	Number who set a deposit limit	Number who completed a commitment device
Control	348	N/A (N/A)
Treatment A: Self-persuasion	282	36 (12.8%)
Treatment B: Personal commitment	231	145 (62.8%)

In addition, the groups of participants who *did* set deposit limits are not necessarily comparable between the control and treatment arms. This is due partly to the fact that (as is reported later) the commitment device caused fewer participants to set a deposit limit. This means that comparing the size of the deposit limit between these groups only has limited use, because those groups may not be comparable in their composition. We cannot exclude the possibility that those who would have set a higher deposit limit in the treatment arms instead set no limit at all, and hence do not contribute to the average. Consequently, we cannot say that any difference in the size of the deposit limit set is caused *directly* by the treatment — we cannot exclude the possibility that the treatment may have caused it indirectly by causing some of the participants to select themselves out of the relevant sample. One way in which this might happen is if some participants felt uncomfortable with making a commitment, and therefore set no limit at all, whereas if the commitment device were not present they would have set a very high deposit limit, which for them would be functionally equivalent to no limit at all. If this is the case, it would appear that the treatment lowered the average deposit limit (because some high values were removed from the sample).

Thus, we mainly present findings as applied to the entire group of customers solicited for the trial, not just those customers who set a deposit limit. This analytical approach is generally

referred to as an ‘intention-to-treat’ approach and is appropriate when we wish to assess the likely effect of an intervention if it has been administered in a similar way to how it would be rolled out more widely, which is the case here. The exception is for the outcome concerning the size of deposit limit set, which necessarily means only those customers who set a limit are included.

4.3.2 Key finding 1: Our interventions had no effects on the amounts deposited by customers

Our first outcome concerned whether the groups differed in terms of the average amount customers deposited into their accounts. For each group, we compared the mean amounts deposited in the 30 days following the invitation to set a deposit limit. Table 2, below, shows summary statistics for this outcome.

Table 2. Summary statistics for amounts deposited over 30 days by customers in the trial.

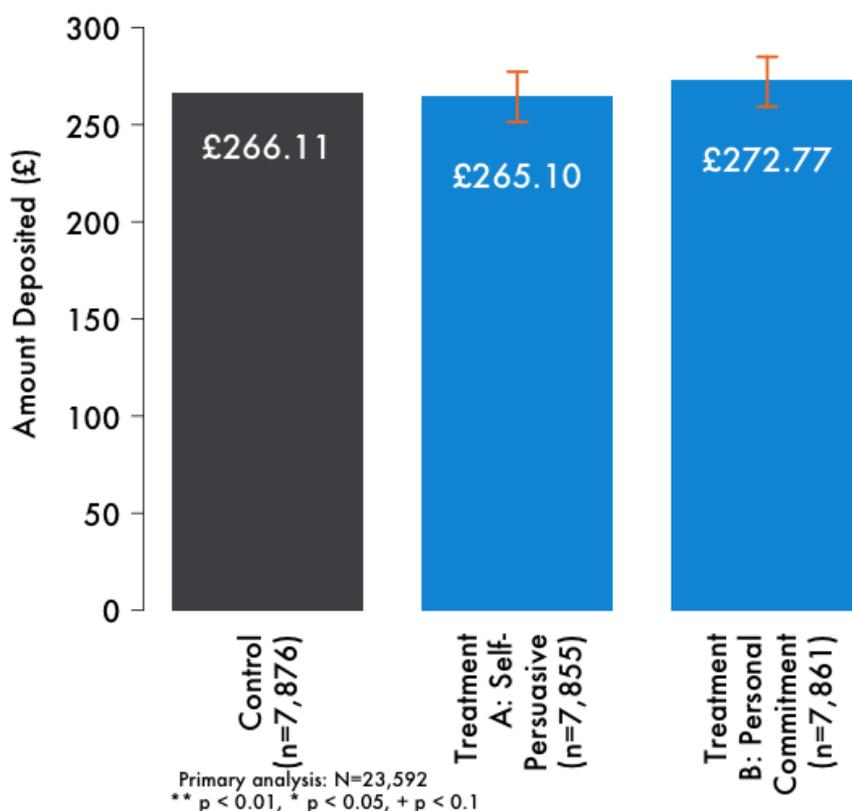
Outcome	Treatment arm	N	Median (£)	Mean (£)	SD (£)
Amount deposited over 30 days after setting limit	Control	7,876	50.0	266.1	816.9
	Treatment A: Self-persuasion	7,855	50.0	264.6	844.7
	Treatment B: Personal commitment	7,861	50.0	281.0	943.1
	All customers in the trial	23,592	50.0	270.6	869.9

Table 2 indicates the averages of the actual observed values of deposits for each treatment group. For our subsequent analysis to determine the estimated size of the impact that our interventions have on the size of deposits (see Figure 13, below), for each customer we log-transformed the actual values of their deposits, which reduced the influence of extreme values in the data. This means that while Table 2 indicates the averages of the actual observed values of deposits for each group, for the treatment groups in Table 2 are analysed on the log scale to determine group differences. The values from this analysis were then converted back to their original form (in pounds) to aid interpretation. We used regression analysis to estimate the degree to which we would expect the average deposited amounts observed in the control group to change for each type of treatment. Figure 13, below, shows the findings of this analysis, with the full regression model specification provided in Appendix A4. Error bars in the figure represent the 95% confidence intervals for each group.

The average amounts that our analysis estimated would be deposited in each arm were very similar: where those in the control arm deposited £266.11 on average, we predict that if those customers were exposed to our interventions then they would deposit £265.10 (95% CI

= £251.36 – £277.35), and £272.77 (95% CI = £259.30 – £284.98) for the self-persuasion and personal commitment treatments, respectively.

Figure 13. Amount deposited in the 30 days following intervention, for each experimental arm, controlling for gender, age, and pre-intervention gambling behaviours.



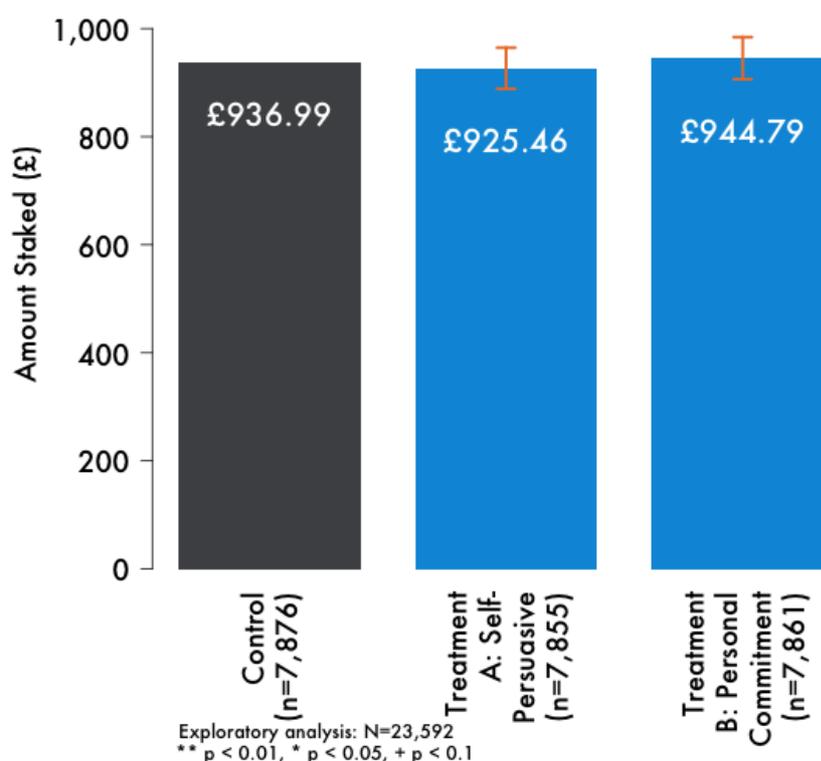
There is no evidence of a treatment effect on the amount participants deposited in the 30 days following intervention. That said, we would expect any apparent effect to be quite small given that less than 4% of participants set a deposit limit during the trial. For comparison, there were also only minor differences in the average deposits of each group in the 30 days *prior* to having set a deposit limit in the trial, where each group deposited £298.47 (95% CI =£277.43 – £319.50), £285.30 (95% CI =£266.55 – £304.05), and £287.92 (95% CI =£269.13 – £306.71) respectively.

Additionally, across the entire group of participants who set deposit limits during the trial average deposits were higher (average £983) in the 30 days before the invitation to set a deposit limit than customers who did not set a deposit limit (average £264). This likely reflects that those who spend more gambling are more tended towards using deposit limits generally, compared to those who gamble less, or less frequently.

There was also very little evidence that the interventions caused any difference in other play-based outcomes, such as the total stakes (a secondary outcome, detailed below) or the net winnings (an exploratory outcome, detailed in Appendix A4).

For amounts staked (Figure 14), the trend indicates that customers in the personal commitment treatment arm staked marginally more, while customers in the self-persuasion arm staked marginally less compared to customers in the control condition. Neither of these observations are statistically significant at the 95% confidence level, meaning we cannot be sure these trends are caused by either intervention. We can see this visually by inspecting the error bars in Figure 15, below; these bars represent the 95% confidence intervals for each group's estimated 'amount staked', and we see that the treatment arms' confidence intervals overlap the control group mean.

Figure 14. Amount staked in the 30 days following intervention, for each experimental arm.



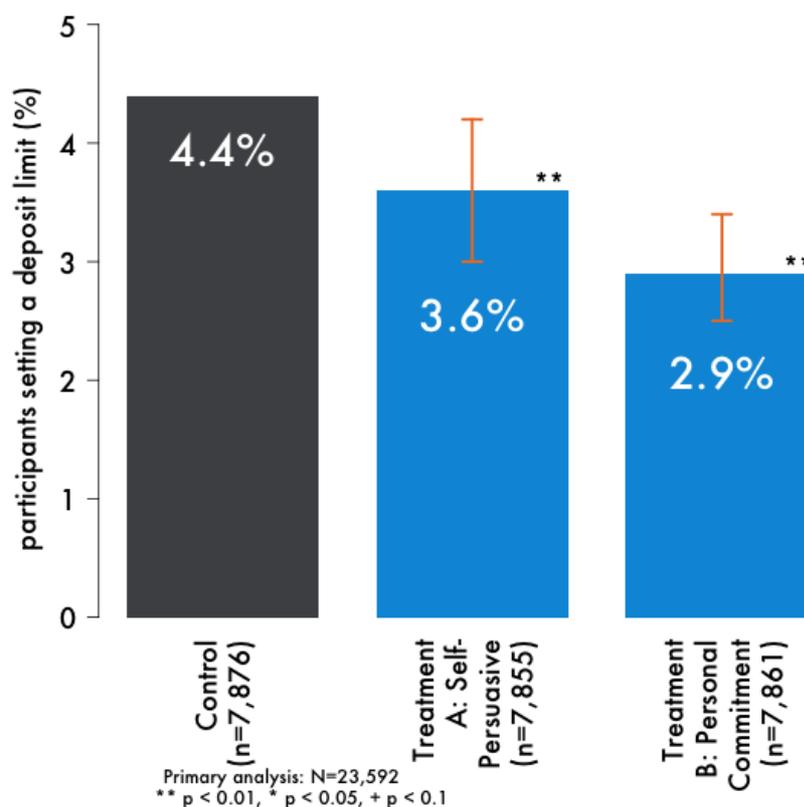
4.3.3 Key finding 2: Fewer participants set a deposit limit in the treatment arms, but lower average limit sizes were observed

Our next primary outcome concerned whether or not our interventions impacted customers' uptake of deposit limits. It should be stressed that it was not mandatory for customers in either treatment arm to engage with the intervention itself in order to set a limit: customers could opt to set a limit and simply ignore the added function of setting a personal commitment, for example. Nonetheless, customers in each treatment arm may still have been influenced by the presence of the intervention.

Figure 15, below, shows the proportions of customers in each condition that opted to set deposit limits. Significantly fewer participants set any kind of deposit limit in the treatment arms. Where 4.4% of customers in the control condition (N=348) set a limit, approximately 20% fewer customers in the self-persuasion arm (3.6% of the group, N=282) (95% CI = 3.0%

– 4.2%), and one third fewer customers in the personal commitment arm (2.9% of the group, N= 231) (95% CI = 2.5% – 3.4%) opted to set limits.

Figure 15. Proportion of participants setting deposit limits.



Despite a lower proportion of limit uptake in the treatment arms, the average size of the deposit limit observed for the control group was £3,021, compared to £2,456 and £2,429 in each of the treatment arms (see Table 3).³ Note that we did not test whether this difference is ‘statistically significant’ because the groups of people setting deposit limits in each arm are not comparable, and we would not be able to conclude that the interventions affected the size of the deposit limit that any particular individual set. See Figure A3 for further details on the distribution of deposit limits by treatment arm.

Table 3. Summary statistics for size of deposit limit set by customers in the trial.

Outcome	Treatment arm	N	Median (£)	Mean (£)	SD (£)
Size of deposit limit	Control	348	33.3	3,020.9	13,570.3
	Treatment A: Self-persuasion	282	33.3	2,455.7	12,164.0

³ Customers can set concurrent daily, weekly, and monthly deposit limits if they wish. To simplify the analysis, we converted weekly and monthly deposit limits into equivalent daily limits; we took the lowest limit out of a customer’s daily, or converted weekly/monthly limits as that customer’s initial deposit limit. To illustrate: if on day one of the observation period customers set a daily limit of £10 and a weekly limit of £50, we took their initial deposit limit as £7.14 (because $£50 \div 7 < £10$). We then calculated the average initial deposit limit set by each of the three groups in the trial.

Treatment B: Personal commitment	231	25.0	2,429.1	12,008.2
All players who set deposits	861	33.3	2,677.0	12,700.2

4.4 Limitations and constraints

4.4.1 Sample limitations

Sample size

As in our anchoring trial, we observed very low uptake of the offer to set a deposit limit despite the recruitment prompts we designed with bet365. Very early in the trial development we analysed power calculations assuming 5000 customers per arm, and estimated that 50% take-up of deposit limits would permit sample sizes with good power (equivalent to roughly 7500 customers setting limits). From the maximum reachable sample of 23,592 bet365 customers, only 3.6% (N= 861) opted to set a limit during the trial period. This is comparable not only to our level of observed uptake for our previous deposit limit trial with bet365 (4% uptake), but also to [other prior BIT trials](#) on safer gambling tools. It is also higher than uptake seen in other online gambling research, in which 1.2% of 47,000 customers set limits.³³

Ideally, we would have targeted a larger number of bet365 customers with the recruitment prompts. At the project outset we envisaged the same recruitment procedure for both this, and our anchoring deposit limit trial. That is, we anticipated soliciting both existing customers currently without limits in place, and newly-registered customers via recruitment pop-up messages. As with our anchoring trial, targeting newly-registering customers was ruled out by the operator on the grounds of the level technical development it would require to sample from and randomise these customers. Being able to include both newly-registered customers, and existing customers would have permitted a more representative pool of customers from which to draw for the trial. In reality, being limited to existing customers — those who have largely already declined deposit limits — may mean we underestimate the impact of the trialed interventions

We were only able to target 23,592 customers because this trial used SMS text reminders as a core element. Only customers who had opted in to SMS marketing when creating their bet365 accounts could be targeted, and within those customers, we were able only to include those who had already received a marketing SMS from bet365. This is because the functionality that allows recipients of SMS marketing to respond and opt out (i.e. by responding to the message with 'STOP') only becomes active when a marketing SMS has been received. Our trial relied on the same functionality to allow customers to opt out of reminder prompts about their chosen personal commitment, for example. As such, the risk was that some customers who took part in the trial but who had not previously received a marketing SMS from bet365 would not then be able to prevent further reminders by texting 'STOP'.

Sample composition

Given that roughly half of all newly-registering bet365 customers voluntarily opt to set deposit limits (as noted by bet365), excluding these customers proved a significant barrier to overall uptake during the trial. Crucially, the current trial sample was likely to be different from the wider bet365 customer base. Existing customers without deposit limits comprise a specific subset of bet365's overall customer base, and one which may behave differently in terms of their gambling and use of safer gambling tools more generally. Furthermore, selection bias may be an issue given uptake of the offer to set a limit in the trial was entirely voluntary. To counter this risk, we restricted ourselves to analyses which are not affected by this issue, and noted which analysis would be vulnerable to it.

In sum, we caution that the final sample of 23,592 customers may not be representative of the target population of limit setters. Where possible, future research on improving deposit limit tools should target a more widely-representative group of gambling customers.

4.4.2 Trial implementation constraints

The main implementation constraints we faced with this trial matched closely with those reported for our previous deposit limit trial on anchoring, and concerned a) the recruitment process, and b) the timing of prompts displayed to customers.

BIT's previous trials on safer gambling tools have shown that reducing the friction involved in accessing such tools (i.e. reducing the number of steps needed) leads to significantly higher uptake. For example: including a direct hyperlink to these tools as part of a safer gambling email saw a relative 23% increase in the number of customers using tools compared to a standard email containing no such direct link.³⁴ While we wished to include a direct hyperlink to the deposit limit tool as part of the prompt email received by customers in the current trial, the operator stated this would not be possible due to technical complexities.

On the timing of solicitation prompts sent to customers: our aim was to display these three login pop-up prompts at a more regular interval, such as one per day over three consecutive days. However, we were only able to display one such prompt per week over a three-week period. Similarly, concerning the reminder prompts served to customers in both treatment arms, our aim was to display reminders at a variety of touchpoints such as a) upon making a deposit, or b) when having reached 50%, and 80% of one's chosen deposit limit. Again this was not possible owing to technical and development limitations on the operator's part. A range of behavioural science research shows that prompting people at timely moments — when they are more likely to be receptive to ideas — increases the likelihood of behaviours including repaying fines and charitable giving.³⁵ Research on timely prompts in the context of gambling remains extremely limited, with one recent report suggesting that prompted customers are more likely to set limits as part of registration, or just prior to making a deposit.³⁶

At a more minor level, some of the final trial materials and messages were somewhat different from original specifications, much as in our previous deposit limit trial. That is, bet365 were unable to amend the header message contained within login prompts ('Only gamble what you can afford to lose'), nor could we amend the visual emphasis of the displayed text (e.g. through bolding) (see figure A.1 in the Appendices), which may have undermined the prompts' salience.

We also consider the possibility that SMS messages may have gone ignored. For example, customers receiving a message from bet365 may have assumed any such message was marketing, and chosen to ignore it.

5. Key reflections, and next steps

Chapter summary

- The interventions we trialled led to lower uptake of deposit limits, suggesting the intervention had a backfire effect within the context of the trial.
- There may be a number of causes including that the commitment functionality added friction, or there were other discouraging factors to the process of setting a deposit limit.
- There was greater uptake of limits by customers who had gambled more in the immediate period prior to the trial.
- Participants in the treatment groups were observed to set lower limits than the control group though this is subject to sampling caveats and may not have been caused directly by the commitment device.
- The question remains of whether industry standard deposit limit tools are an effective way of helping customers to control their gambling.
- Further behavioural science research could consider opportunities for helping customers to set reasonable deposit limits; evaluate when to solicit limit setting behaviour; and consider how perceptions of deposit limits can be shifted to increase their uptake.
- Safer gambling tools still warrant further robust evaluation and innovation and facilitation of this activity from policymakers.

5.1 Key findings

We set out to assess whether proactively encouraging customers to consider their motivations would affect how they set deposit limits. Our principal finding was that these interventions reduced the number of customers who then chose to set a deposit limit (a backfire effect in the context of this trial). One reason for this outcome could be that, in a number of possible forms, our trial added frictions (e.g. psychological barriers) to the process of setting a deposit limit, and/or other elements of the trial were discouraging to customers. For instance:

- **Customers in the treatment arms were presented with more information and choices.** While customers in our treatment arms were free to set limits without also setting a reason/advice, they were confronted with more text on-screen compared to those in the control group. Treatment group customers were also faced with another choice — either to set a commitment/advice or not — which may have deterred some from completing the process.
- **Asking customers to think about why they might be setting a limit may have triggered an aversive emotional response.** Many view safer gambling tools as only for people who are experiencing issues with their gambling.³⁷ This could translate into negative self-perceptions when engaging with these tools. Other research shows that gambling issues are also subject to high degrees of public stigma, which typically leads to self-conscious emotions.^{38 39} The addition of more directed self-consideration into the limit setting process — whilst voluntary in terms of uptake — may nonetheless have roused negative emotions that triggered a more generally avoidant response.

- **The use of SMS messages may have been too inflexible.** Reminders were offered via SMS only, with no alternative channels available. While trial participants had opted in to SMS messages from bet365, there may nonetheless have been reticence to receive trial reminders without full awareness of how these messages might appear when received, or without being able to opt for reminders via email, for example.

Further, our trial evaluated a form of relatively ‘soft’ commitment device, based on reminding customers why they set a limit. As discussed in Chapter 3, commitment devices can take a range of other forms. The various limitations experienced by the trial as discussed in Chapter 4 may also partly account for our findings.

Despite the primary finding indicating a reduction in limit uptake in our treatment groups, an interesting observation was that the average size of the limit was potentially lower in these arms, by around £550 – £590. This is a tentative observation of the group means, and future work assessing commitment devices and deposit limits should test this more stringently. Nonetheless, this observation may suggest that prompting customers to consider why they are setting a limit could yield a change in limit setting behaviour that further reduces their potential exposure to harm. Self-appraisal-type messaging, for example, has otherwise been associated with gamblers ending their current gambling session.⁴⁰ Of interest would be to explore why thinking of a personal reason might lead someone to subsequently choose a lower limit.

A further observation of note is that customers in the trial who spent more in the 30 days prior to the trial were more likely to set a limit during the trial period. Prior gambling research has found that pop-up messages — those that cause an ‘interruption’ and require an action on the user’s part to dismiss — are potentially more effective at minimising harm.^{41 42} Similarly, customers in our trial received an explicit pop-up prompt to set a limit, and our findings could suggest that such messages are more effective for those who gamble more.

5.2 Outstanding questions for how behavioural science could improve the effectiveness of deposit limit tools

Across BIT’s work we have observed that safer gambling interventions have affected the proportion of customers who set a deposit limit (some positively, some negatively). However, we have failed to observe any significant impact of deposit limit interventions on the amount of money customers subsequently deposit. We have so far only observed small effects that were not statistically significant. Other research has found that setting voluntary monetary limits does appreciably reduce the amounts spent, but only in the most intensive gamblers.⁴³

The question therefore remains of whether industry standard deposit limit tools are an effective way of helping customers to control their gambling, and whether customers who do set deposit limits derive tangible harm-reduction benefit from having done so. There are a number of potential avenues for future behavioural science research to consider:

1. Helping customers to set meaningful limits

- While we do not know the overall financial status of the customers in our trial, there remains an open and important question around how customers decide on the size of their chosen limit, and if customers could benefit from guidance. Canada's [Centre of Substance Use and Addiction](#) are currently developing the first national guidelines for lower-risk gambling, indicating the potential value of this form of information provision. Similar work has been done in Australia.⁴⁴
- That customers set much smaller limits when high denominations are removed (detailed in [Part 1](#) of BIT's deposit limit research) highlights how sensitive this choice is to external factors. Further research is needed to understand other influential situational factors affecting these choices.
- There remains scope for further research on how the design of deposit limits can be improved. This could include testing 'harder' commitment device designs. It could also include testing whether interventions are more effective if tailored to specific customer segments. Among those that took up the deposit limits in this study, the amounts deposited were observed to be lower in the intervention groups, raising the possibility that the soft commitment devices may be more effective for certain specific profiles of customers.

2. Evaluating when to solicit limit-setting behaviour

- As with our previous anchoring trial, we observed very low uptake of the offer to set a limit, and we discussed in Chapter 3 that other research points to very low uptake of self-exclusion tools.
- At present, online gambling customers are generally offered the option of setting a deposit limit when newly-registered. Future research could investigate whether prompts at other salient touchpoints could increase limit uptake.
- For example, customers could be served a prompt (like those used in the current trials) when having made a deposit or having placed a bet. These particular touchpoints may help customers to make more informed decisions about a limit within the current context of their gambling behaviour.
- Additionally, folding the option of setting a limit into other choice elements in the user journey may increase uptake. To illustrate: typically, customers are required to navigate to dedicated pages or menus in order to set limits; building in the option of setting a limit at the same time as, say, placing a bet (and thereby considerably removing frictions) could be explored. Embedding a 'symmetry principle' into choice design has also been advocated in other consumer domains by organisations including Ofgem, the Financial Conduct Authority, and the Competition and Markets Authority.⁴⁵

3. Shifting perceptions on deposit limits to increase their uptake

- Although many perceive deposit limits to be useful, they are also widely-regarded by gamblers as only applicable to people experiencing problematic gambling issues.⁴⁶ Such perceptions, combined with language that conveys constraint ('limit') could factor into the low rates of self-initiated deposit limit use as observed here.
- Opportunities to reposition deposit limit tools using behavioural insights should be explored, such as reframing these tools away from implicit restriction (e.g.

towards language like ‘safety net’), or shifting towards a default opt-out deposit limit in order to normalise uptake.

- Existing research indicates, for example, that less than 1% of Australian gambling customers (N = 47,000) exceed an imposed deposit limit, and separately that a majority of customers are willing to accept mild disruptions to their play if it is to benefit those experiencing harm.⁴⁷
- A recent BIT evaluation of safer gambling messaging found that social media campaigns, and new customer sign-up processes can be particularly effective channels/touchpoints through which to increase uptake of safer gambling tools.⁴⁸

5.3 Overall reflections for industry, policymakers and researchers

The current trial, and that reported in [Part 1](#) of this work, are some of the first trials in a live business environment involving customers of a major British online gambling operator. These trials have given rise to a number of key reflections that may provide valuable insights for policymakers, operators and researchers.

Key reflections for policymakers



Target: Policymakers

Innovations in safer gambling tool provision have not kept pace with that in other areas of product development. While the [Gambling Commission](#) has instigated a number of direct challenges to the industry aimed at increasing standards and practice, these have focused mainly on the design of game products such as slots, or advertising technology.

Industry-standard safer gambling tools such as deposit limits, by comparison, have seen little to no iteration in their design over the same period, looking much the same in these current reports as they did in BIT’s earlier research in 2018. In light of this, and of the overall lack of evaluations of safer gambling tools, we recommend that the regulator calls on the industry to show demonstrable innovation in their safer gambling tool designs. For instance, operators could be challenged to show growth in the uptake or use of their safer gambling tools year-on-year and underline steps taken to meet that goal, or to carry out trials similar to that reported here.

Key reflections for the industry



Target: Industry

There remains a paucity of evidence concerning the impacts of safer gambling tools on British gamblers’ behaviours. Research on safer gambling tools has increased with the rise in online gambling in particular, but much of the major research stems from international studies.^{49 50 51} Given the strong role that cultural and sociological factors can play in gambling behaviour, there is a clear need for research that contextualises the impacts of safer gambling

	<p>tools for British gamblers.⁵² Operators are key to fulfilling this need. They remain the central brokers that can enable access to the customers and data needed for evaluations to take place. It is insufficient for safer gambling tools to merely exist without testing their harm prevention effectiveness. Operators should seek to work with researchers to conduct the best versions of these types of trials possible.</p> <p>Robust trials necessitate being able to recruit from the most representative samples of gambling customers possible. A core aim of the industry's Betting and Gaming Council body is to 'encourage the widespread adoption and use of safer gambling tools', and how best to achieve that goal requires that research better understands the key parameters such as who uses these tools, how, when, and why. Live trials offer the most robust means of gaining these insights, but it is imperative that such research can assess the behaviour of representative samples of gambling operators' customers. For example, including new and existing customers. Without this, there is reduced certainty that findings can be applied generally across customers.</p>
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Key reflections for researchers



Target: Researchers

Our experiences have been that major industry players are receptive to carrying out independently-led randomised controlled trials, though compromises may be necessary. While some compromises were made (e.g. when prompts/reminders were served; which customers could be targeted), our trials were mostly carried out to technical and design specifications that closely resembled our original vision. Our trials carried out under the current project, and those carried out in [earlier](#) BIT work, have demonstrated the possibilities on which future, more ambitious trials could be based.

Even seemingly simple changes to an operator's site will require substantial lead time to implement. In a live business environment, operators will require any changes to be reviewed and signed-off internally, before being developed and tested before approval. This can mean relatively long lead times and researchers should be mindful and account for this when planning their trials. Similarly, other developments — such as new regulatory requirements — may disrupt trial development on account of operators redeploying resources to higher priority tasks.

A clear specification for an experiment / trial is needed upfront, including expectations around trial data. Researchers must seek express clearance from operator partners as early as possible on

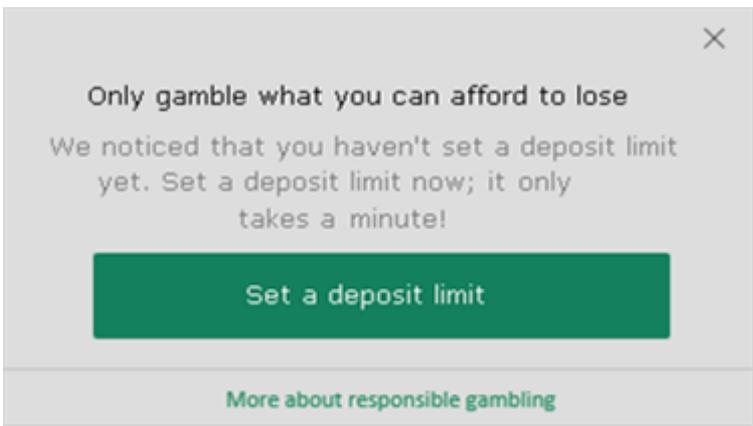
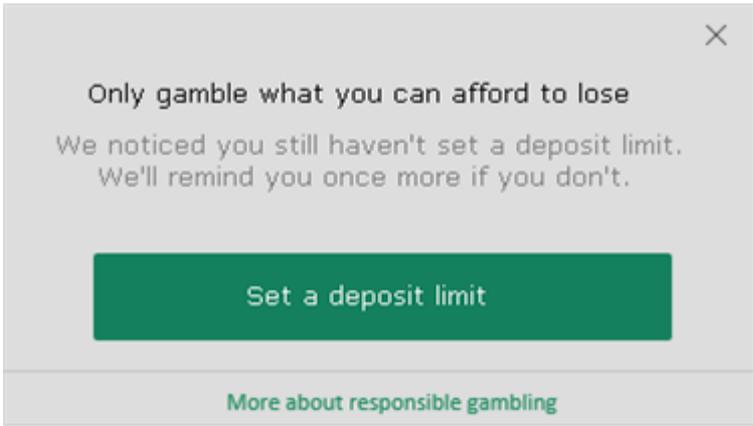
	<p>what is/is not feasible. This is an especially important consideration in light of the fact that some operators outsource their technical development, and can therefore be uncertain about what is technically possible. In such cases, there is also likely to be additional lead time between the operator submitting requests to their external developer, and those requests being fulfilled. Trials involving deposit limits are likely to experience low uptake, with our targeted sample of 23,000 customers yielding 861 limit setters, which was considerably less than the multiple thousands necessary for good statistical power. It is likely that being able to target new as well as existing customers for these sorts of trials would ameliorate this issue.</p>
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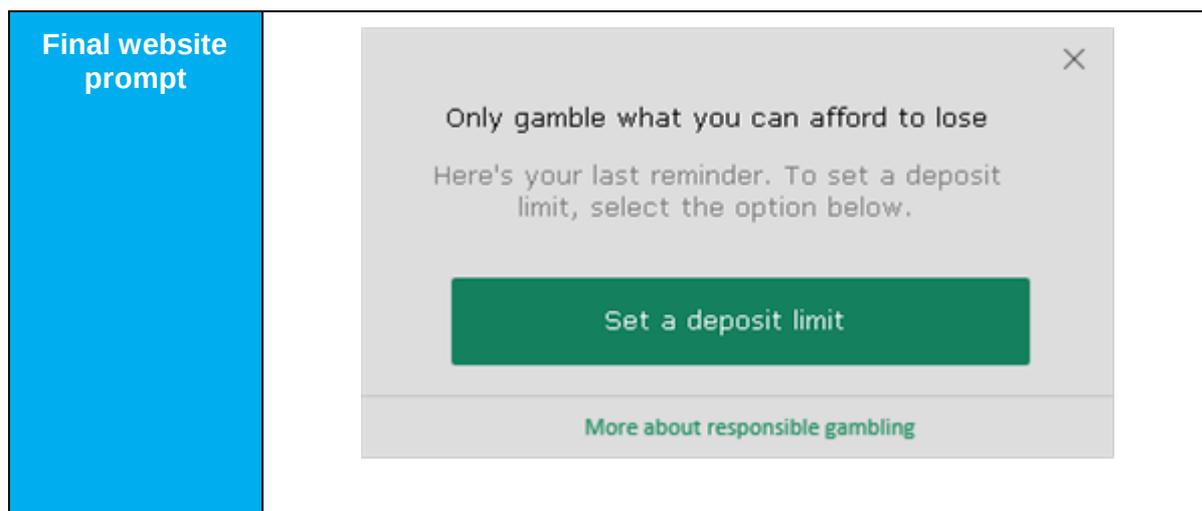
Appendices

A1. Trial recruitment materials, and reminder materials

The 23,592 customers to be targeted for the trial each received a series of prompts aimed at encouraging them to set a deposit limit. In total, a customer could receive three pop-up messages upon login to their bet365 account, and one email prompt. Figure A1, below, shows the three login pop-up prompts displayed in the trial.

Figure A1. Website pop-up recruitment prompts received by customers targeted for the trial

First website prompt	
Second website prompt	



All customers without deposit limits received one such prompt per week over a 30 day recruitment period. In addition, players who did not respond to the first login prompt by setting a limit received an email prompt two days later:

'Hi [Name],

Many bet365 players set deposit limits and we encourage all our members to do so. We've noticed that you haven't set one yet. Click here to set your own limit.

Deposit limits help you stay in control of how much you're playing, and protect you from spending more than you can afford. We encourage you to set one too. It only takes a minute.

*Thank you,
bet365'*

Customers continued to receive prompts until either (a) they had set a deposit limit, or (b) they had received all prompts.

The table below provides a list of all messages displayed to customers in both treatment arms. These messages were shown at different stages of the user journey as illustrated by Figure 7 (pg. 20). Customers also received three reminder messages in the following month, after they had set the deposit limit (Stage 3, Figure 7). Messages were also displayed when a customer reached their limit or tried to change it (Stages 4 and 5, Figure 7).

Table A1: Additional messages and content included on deposit limit screen in each treatment arm

Stage	Personal commitment	Self-persuasion
Stage 1 - Deposit limit screen: Before setting a limit	<i>People use deposit limits for lots of different reasons. Why not take a quick moment to think about why you are setting a deposit limit?</i>	<i>Before you set a deposit limit, why not take a moment to think about the advice you would give to someone else who is setting a deposit limit?</i>
Stage 2 - Deposit limit screen: After setting a limit	<p><i>Below are some common reasons for setting a deposit limit. If none of these seem right, select 'Other' and enter your own reason:</i></p> <p><i>[Dropdown menu with available options:]</i></p> <ul style="list-style-type: none"> ● <i>A deposit limit will help me stick to my budget.</i> ● <i>I want to spend less time playing.</i> ● <i>I want more control over how much I play.</i> ● <i>This is how much money I have to play with.</i> ● <i>I think I'll spend less than this limit.</i> ● <i>Other [when selected shows free text box: 'I am setting a deposit limit because _____']</i> <p><i>We will remind you of this reason from time to time. To stop receiving messages, simply return to this page and select 'Don't remind me'. Alternatively, text STOP to XXXXX.</i></p> <p><i>We will check statistics to see if adding a reason can help people stick to limits. This is part of bet365's ongoing efforts to promote safer gambling.</i></p>	<p><i>Feel free to write a sentence or two in the box below on the advice you would give to someone else who is setting a deposit limit.</i></p> <p><i>I would advise this person to [free text box]</i></p> <p><i>We will remind you of this reason from time to time. To stop receiving messages, simply return to this page and select 'Don't remind me'. Alternatively, text STOP to XXXXX.</i></p> <p><i>We will check statistics to see if adding a reason can help people stick to limits. This is part of bet365's ongoing efforts to promote safer gambling.</i></p>
Stage 3 - 3 days after limit is set	<i>We confirm that you have set a deposit limit of [amount] every [24 hours/7 days/30 days] because [reason/free text]. It can be helpful to remember this reason when deciding how much to deposit. We'll remind you about it every so often. Text STOP to XXXX.</i>	<i>We confirm that you have set a deposit limit of [amount] every [24 hours/7 days/30 days]. Your advice to someone setting a deposit limit was to [free text]. We'll remind you of this advice every so often. Text STOP to XXXXX.</i>
Stage 3 10 days after limit is set	<i>Hi [first name]. Just a quick reminder that your reason for setting a deposit limit was because [reason/free text]. Text STOP to XXXX.</i>	<i>Hi [first name]. Just a quick reminder that your advice to someone setting a deposit limit was to [free text]. Text STOP to XXXXX.</i>
Stage 3 21 days after limit is set	<i>Hi [first name]. As one final reminder from us, remember that when you set your deposit limit you said you were setting it because [reason/free text]. Text STOP to XXXX.</i>	<i>Hi [first name]. As one final reminder from us, your advice to someone setting a deposit limit was to [free text]. Text STOP to XXXXX.</i>
Stage 4 - Deposit limit screen: Changing or removing a current limit	<i>Remember, you initially set this deposit limit because [reason or free text entered upon setting deposit limit].</i>	<i>Hi [customer name], remember that your advice to someone setting a deposit limit was to: '[advice]'</i>

Stage 5 - Deposit screen: If deposit limit reached	When deposit made that meets a limit: <i>You have reached your [24 hour/7 day/30 day] deposit limit of [amount]. Remember that you initially set this limit because [reason or free text entered upon setting deposit limit].</i>	When deposit made that meets a limit: <i>You have reached your [24 hour/7 day/30 day] deposit limit of [amount]. Remember, your advice to someone setting a deposit limit was to [reason or free text entered upon setting deposit limit].</i>
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A2. Additional trial sample considerations

Sample size targets, and power calculations

We used the following assumptions for all power calculations:

Number of trial arms: Three — we use a Bonferroni correction (dividing the significance threshold by the number of comparisons) for two comparisons (each treatment arm is compared to the control)

Clustering: No clustering.

Significance level: 0.05 (before adjusting for multiple comparisons)

Power: 0.8

We conducted power calculations for our primary outcomes before the trial started to determine minimum detectable effect sizes (MDESs) for each outcome. bet365 initially proposed a total sample size of 27,000 (divided equally between the three arms) for the trial which, based on our calculations gave a Cohen's h of 0.05 for the first primary outcome (total amount in £ deposited over 30 days, and a Cohen's d of 0.05 for the second primary outcome (whether a customer sets a deposit limit). Unfortunately, we did not have access to baseline data for the outcome on size of deposit limit. Assuming 50% take up of deposit limits in the sample would mean the trial could detect a change of 0.05 standard deviations in this outcome. The 50% uptake assumption was based on discussions with bet365 that indicated that around half of all new customers opt to set a deposit limit. While our trial sampled only existing customers, it involved a direct solicitation to set a limit, as is the case with new customers.

With the trial recruiting only from existing customers who do not currently have deposit limits in place, the risk was that uptake of the deposit limit offer would be low. We therefore also calculated MDES based on lower rates of uptake. Assuming lower rates of uptake, the trial was powered to be able to detect changes in the order of 0.14 SD (5% uptake), 0.10 SD (10% uptake), and 0.08 SD (15% uptake). We consider these to be small effect sizes.

In addition, we conducted post-hoc power calculations with the actual trial sample, given that actual total sample afforded by bet365 amounted to 23,592 customers:

- First primary outcome (total amount in £ deposited over 30 days): Cohen's d is still 0.05, which (after back-converting the log-transformed outcome) corresponds to a MDES of a £6.02 increase or £5.18 decrease on the control-group baseline of £266.11.
- Second primary outcomes : a) whether a customer sets a deposit limit: Cohen's h is still 0.05, which corresponds to a minimum detectable effect size (MDES) of a 0.22pp

decrease or 0.24pp increase on the observed control-group baseline of 4.42%. b) size of deposit limit: We do not perform power calculations for this outcome since we did not make statistical comparisons between trial arms.

Randomisation and balance checks

We conducted balance checks across the treatment groups across the observable characteristics of gender, age and total deposits in the 30 days before trial start. As Table A2 shows below, the treatment groups were balanced across these covariates, suggesting the randomisation process was executed correctly. There is a slight difference in average age between the two treatment arms, but it is both small (0.34–0.36 years) and not statistically significant (at the 5% level).

Table A2. Balance checks of covariates on treatment.

	(1)	(2)	(3)
	Gender*	Age	Previous deposits (£)
Treatment A:	0.157	39.20	285.3
Self-persuasion	(0.656)	(0.925)	(0.360)
Treatment B:	0.154	39.54 ⁺	287.9
Personal commitment	(0.970)	(0.096)	(0.463)
Control group	0.155	39.18	298.5
N	23,592	23,592	23,592

p-values in parentheses, + p<0.10, * p<0.05, ** p<0.01.

*Gender=0 for male participants and gender=1 for female participants

A3. Trial outcome measures, and observation period

During the observation period of the trial, trial participants who opted to set deposit limits were monitored for 30 days from when they set their limit. The measures fall into three categories:

- **Primary** outcomes which provide the headline results of the trial
- **Secondary** outcomes which are of more peripheral interest relative to the primary outcomes
- **Exploratory** outcomes which are not directly related to the trial's research questions, and unlike the primary and secondary outcomes are not specified beforehand

It is important to limit the number of research questions and outcome measures examined in any one study. This is because the more statistical tests that are run, the more likely it is that significant results will be discovered purely by chance. Therefore, we specified two primary outcomes and one secondary outcome. These were motivated by the trial's research question of whether including a commitment device as part of the limit setting process might appreciably impact limit setting behaviour. Other issues such as whether the outcome could

be measured from the target sample size and the trial's expected timeline were also taken into consideration.

Our final primary and secondary outcome measures were:

- 1) **Primary outcome 1 — Total amount (£) deposited over 30 days.** This reflects the total amount of money that the customers have put into their gambling account, which can be used as a proxy of (financial) harm.
- 2) **Primary outcome — Uptake of deposit limit**
- 3) **Secondary outcome — Total stakes over 30 days.** Defined as the total amount of money bet over the 30 days after a player was prompted to set a deposit limit.

We also conducted analysis for the following **exploratory** outcome measures:

- 4) **Net winnings:** This was calculated as the total payout(s) of a bet(s) minus the amount(s) staked to play the bet(s). Given that customers, on average, lose money playing, average net winnings are expected to be negative. However, lower amounts deposited, lower amounts staked, or amounts staked on less risky games could contribute to a lower negative net winnings figure. For these reasons, net winnings can be seen as a reasonable proxy for risky play.
- 5) **The likelihood of customers removing their deposit limits** to see whether this differed across the trials' arms and customers in these groups
- 6) **Differences between the first and last deposit limit** to see whether this differed across the trials' treatments

A4. Additional findings

Primary outcome 1: Uptake of deposit limit

Take-up of deposit limits was low in the sample. As shown in Table A3 below, around 4% of customers in the sample set a deposit limit. One implication of this is that our trial may not have had a large enough sample to detect differences in outcomes (e.g. the amount deposited) across our treatment groups *among* customers who set a deposit limit due to there being a small number of customers in this group.

Table A3. Descriptive statistics of deposit limits observed in the trial. Note that customers may set multiple limits at different time periods, which are required to be non-decreasing (so, for instance, a customer with a weekly £200 limit may not set a daily limit of £500, but may set a daily limit of £100).

Deposit limit type	Treatment arm	N	Median (£)	Mode (£)	Mean (£)	SD (£)
24 hours	Control	239	150	50	9,973.9	28,433.5
	Treatment 1: Self-persuasion	212	100	100	9,951.4	28,599.9

	Treatment 2: Personal commitment	165	100	25	7,874.8	25,124.1
	All players who set 24 hour deposit limits	616	100	25	9,403.9	27,616.7
7 days	Control	246	250	50	9,264.9	26,285.4
	Treatment 1: Self-persuasion	205	250	50	10,936.8	29,101.9
	Treatment 2: Personal commitment	165	150	25	8,195.6	23,876.8
	All players who set 7-day deposit limits	616	250	50	9,534.9	26,633.9
30 days	Control	218	1000	500	53,280.7	137,603.3
	Treatment 1: Self-persuasion	183	500	100	39,322.9	123,993.5
	Treatment 2: Personal commitment	162	500	1000	44,980.3	125,281.6
	All players who set 30-day deposit limits	563	1000	1000	46,355.4	129,698.1

Primary outcome 2: Amount deposited over 30 days

The impact of the interventions on deposited amounts was estimated using the OLS regression below.

$$\ln(Z_i + 1) = \beta_0 + T_i\beta_1 + X_i\beta_2 + \omega_i$$

Where:

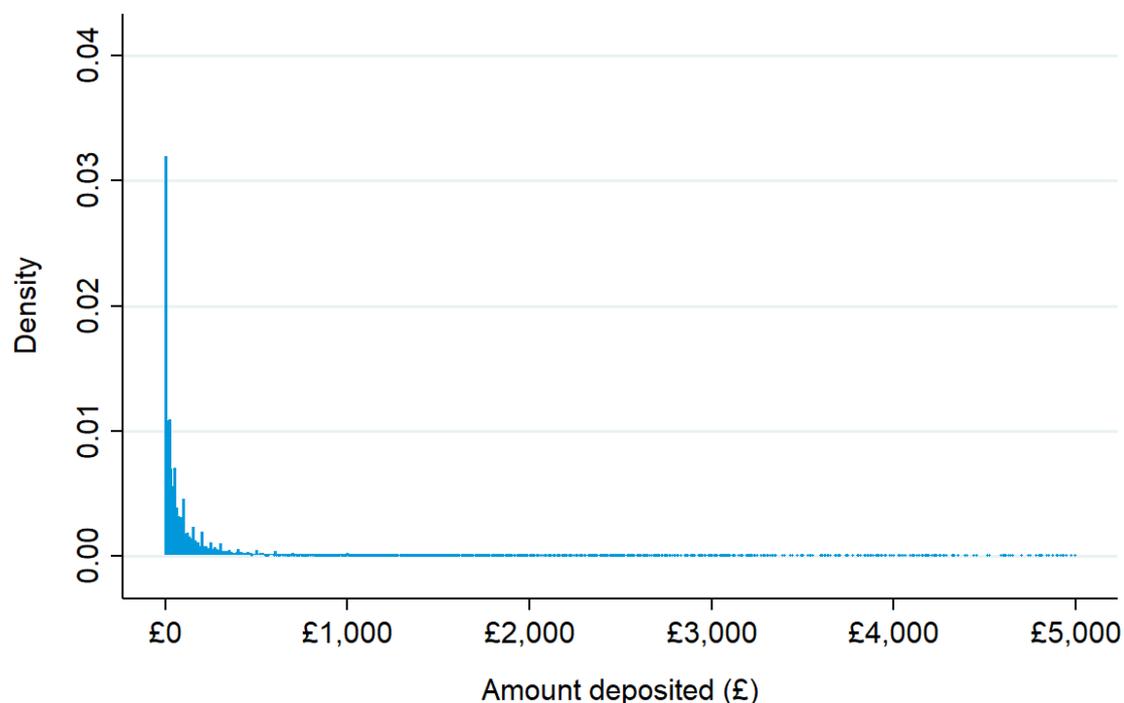
Z_i is customer i 's total deposited amount calculated over the 30 day measurement period. We choose to log the variable because the values of mean and median provided by bet365 indicate that the distribution of deposits is positively skewed (see Figure A2). We add 1 to avoid excluding those with total of zero;

T_i is a matrix of treatment dummies indicating individual i 's treatment allocation;

X_i is a matrix of customer i 's demographic characteristics. The demographic covariates include gender and age. Gender is a binary variable and age a categorical variable; and

ω_i heteroskedasticity robust error term.

Figure A2. Histogram of deposits over the 30 days before trial start



Note: This histogram excludes deposits that are greater than £5,000 (0.7% of the sample) for readability.

Table A4 provides the results of the analysis for the second primary outcome: treatment assignment on amount deposited over 30 days. Column 1 displays the results for all players in the trial and Column 2 displays results for the target population; the sub-group of players who set deposit limits. We find that neither treatment has a significant effect on deposit amounts in either of the two samples.

Table A4. Effect of treatment on log of deposit amount.

	(1) Full sample	(2) Customers who set deposit
Treatment A: Self-persuasion	-0.004 (0.025)	-0.038 (0.144)
Treatment B: Personal commitment	0.025 (0.024)	0.058 (0.138)
Female	-0.268** (0.029)	-0.303* (0.182)

N	23,592	861
Control mean	3.61	4.62

Robust standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01

Figure A3 shows the distribution of deposit limits (among the 861 customers who set them) for each treatment arm.

Figure A3. Distribution of deposit limits.



Secondary outcome: Log of stakes over 30 days

Table A5 presents the results of the analysis investigating the relationship of treatment on stakes over 30 days. This analysis aims to supplement the net winnings analysis and provide some insights on the relationship between the intervention and risk taking. We present results for the full sample in column 1 and the sub-sample of players who set deposit limits in column 2, and again find null treatment effects.

Table A5. Effect of treatment on stakes over 30 days.

	(1)
	Amount staked
Treatment A: Self-persuasion	-0.012
	(0.021)

Treatment B:	0.008
Personal commitment	(0.021)
Female	-0.130**
	(0.024)
<hr/>	
N	23,592
Control_mean	4.93
<hr/>	
Robust standard errors in parentheses	
+ p<0.10, * p<0.05, ** p<0.01	

Exploratory outcome: Net winnings over 30 days

Secondary analysis focused on the impact of interventions on customers' net winnings. This analysis includes all customers in the trial, regardless of whether they set a deposit limit or not. The model was specified as follows:

$$W_i = \gamma_0 + T_i\gamma_1 + X_i\gamma_2 + v_i$$

Where:

W_i denotes customer i 's total net winnings calculated over the 30-day measurement period (this is negative if the customer lost money, and reflects only the outcomes of bets and not deposits or withdrawals);

T_i is a matrix of treatment dummies indicating individual i 's treatment allocation; X_i is a matrix of customer i 's demographic characteristics. The demographic covariates included are gender and age. Gender is a binary variable and age a categorical variable; and

v_i is the error term. We will use heteroskedasticity robust standard errors in our parameter estimates.

Table A6 provides the results of the secondary analysis. After correcting for multiple comparisons, we do not find that either treatment has a significant impact on net winnings; the unadjusted p-value for treatment B is slightly below 0.1 ($p=0.090$).

Table A6. Effect of treatment on net winnings.

	(1)
	Net winnings
Treatment A:	-1.789
Self-persuasion	(7.619)
Treatment B:	17.017
Personal commitment	

	(10.044)
Female	37.626**
	(8.013)
N	23,592
Control_mean	-68.48
Robust standard errors in parentheses	
+ p<0.10, * p<0.05, ** p<0.01	

Exploratory outcome: Removed deposit limits

Table A7 provides the results on the effect of treatment assignment on removing deposit limits for players who set limits. Column 1 presents the coefficients and column 2 the marginal effects. We do not find any significant treatment effects — though it should be highlighted that this analysis is severely underpowered.

Table A7. Effect of treatment on probability of removing deposit limit.

	(1) Removed deposit limits — Coefficients	(2) Removed deposit limits — Marginal effects at means
Treatment A: Self-persuasion	0.083 (0.301)	0.005 (0.016)
Treatment B: Personal commitment	-0.204 (0.332)	-0.010 (0.017)
Female	-0.632 (0.538)	-0.033 (0.027)
N	861	861
Control mean	0.089	N/A

Robust standard errors in parentheses. Note: The removed deposit limit outcome is equal to 1 if a customer had no deposit limit 30 days after setting a deposit and 0 if a customer had a deposit limit 30 days after setting a deposit limit. + p<0.10, * p<0.05, ** p<0.01

Exploratory outcome: Differences between the first and last deposit limit

None of the 861 individuals that set a deposit changed it over the course of the trial, so we do not observe any significant treatment effects.

Endnotes

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