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Inviting Online Gamblers To Do A Self-test – Effect On Their Gambling Behavior and Use Of Responsible Gambling Measure

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Abstract. Self-tests are a core component in online gambling operators' duty of care. There is limited empirical data on what factors moderate how self-tests work as a responsible gambling (RG) measure. The objective of the current study was to examine the effectiveness of self-test as an RG measure. In two separate studies, we investigated whether actively prompting gamblers through messaging led to a greater number of started and completed self-tests, compared to passive routings (Study 1); and whether being prompted to do a standard or shortened self-test influenced RG tool use and gambling activity (Study 2). Study 1 used Google Analytics data from one company and Study 2 was an A/B test conducted at another gambling company (n=12,000). The results of Study 1: active messages stood for 75 % of finalized self-tests, the link bar 23%, and the RG page 1.6%. In Study 2, we found no effect on gambling behavior nor use of RG measures after self-test invitation compared to controls. The findings from these two studies suggest that despite a low completion rate, the link bar generates a substantial number of performed self-tests. The number of self-tests performed at a gambling company can be increased by different simple and cost-effective measures.

Keywords: Self-test, Duty-of-care, Responsible Gambling, Prevention.

Introduction

Gambling is a popular leisure activity among adults in most countries and a common source of direct or indirect revenue for governments (Walker & Sobel, 2016). For the minority of the gambling population, however, it can become a problem characterized by mental health issues, financial stress, social problems, and an overall vulnerability to crime, substance, and alcohol abuse (Calado & Griffiths, 2016). Some studies estimated that while 3.5 – 7 % of the population show some signs of problem gambling (PG), up to 3.5 % - 5 % exhibit a more serious form of disorder – termed pathological gambling (American psychiatric association, 2013, Welte et al, 2015). Current data shows that a large proportion of revenues from gambling activities originates from PG (Cassidy, 2020). In addition, for every person experiencing gambling harm, an additional six to ten people such as family and close friends can be affected (Castrén et al, 2021; Goodwin et al. 2017).

Consequently, gambling operators are under increasing legislative pressure to provide harm-minimization measures for their customers. Under the umbrella of Responsible Gambling (RG), gambling operators have employed both intervention and prevention measures including preset limits, behavioral tracking tools, and pop-up messages with real-time feedback. While these rely on objective measures of gambling activity, both sensitivity and specificity as proxy measures of gambling harm are far from perfect. In a multi-actor gambling market, any individual operator will only have data on gambling carried out with them; since problem gamblers are more likely than recreational gamblers to gamble with multiple operators (Folkhälsomyndigheten, 2023), this entails that each operator will only see a part of the total gambling expenditure. Second, the concept of affordability – that no gambler should gamble more than he/she can afford to comfortably lose – entails that disposable income will moderate to what degree the same gamble amount is problematic or not across different gamblers (Bedford, 2023; Nower & Glynn, 2022).

For these reasons, there are benefits to supplementing behavioral measures of problem gambling with standardized self-reports. The development of multiple brief screening tools (Sullivan, 2007; Toce-Gerstein et al., 2009) led to the implementation of brief self-tests to determine further interventions (Goodyear-Smith et al., 2017) or self-test as RG measures in themselves (Hodgins et al., 2019) There exist over a dozen validated gambling assessment tools implemented for various purposes including brief screening, early interventions, and treatment planning (Otto et al., 2020; Stinchfield, 2013). Among different instruments, the Canadian Problem Gambling Index (CPGI) and its derivative the Problem Gambling Severity Index (PGSI) (Ferris & Wynne, 2001) together with the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987) have well-established reliability and internal consistency across different settings. Moreover, instruments including the Brief Problem Gambling Screen (BPGS), the Lie/Bet Questionnaire, and the NORC DSM-IV Screen for Gambling Problems have also been employed to assess gambling-related

harms (Dowling et al. 2019; Gerstein et al., 1999; Johnson et al., 1997; Volberg & Williams, 2011).

Recognizing the importance of supplementing behavioral tracking with self-tests, offering such as part of the gambling experience is now a legal requirement in many jurisdictions. Since 2019, for example, it has been mandatory in Sweden for licensed gambling companies to place a so-called link bar at the top of their sites that, among other things, includes gambling self-assessment tools hosted internally or externally. As such, all gambling customers have access to self-tests with personalized feedback and in some cases, recommendations based on their test results. There is a consensus in the extant literature on the valuable contribution of providing cost-effective and brief screening methods with a potential route to further treatment opportunities. Stinchfield et al (2012), for example, found that self-test tools have popular features including covering key problem gambling construct, immediate feedback, high accuracy, ease of use, and confidentiality. A self-test may motivate self-reflection, change and reduce gambling behavior by providing feedback on overconsumption and its negative consequences (Jonsson et al., 2017). As access to gambling increases, self-test tools can provide a means for cost-effective standardized screening tools that can be widely implemented. Consequently, self-test tools are broadly used in clinical and population research settings as well as across gambling actors to assess and prevent harmful gambling (Volberg & Williams, 2011). In particular, three areas of self-test operationalization can be observed in the research – assessing patients for further intervention measures (Håkansson et al., 2020), sifting out research participants to identify meaningful samples (Carneiro et al., 2020), and as part of RG tool toolkit to curb harmful gambling (Jonsson et al., 2017).

In the clinical setting, screening tools (i.e., self-test or at times administrated) are mainly employed to determine the presence of problem gambling for early intervention and treatment. Despite emerging from a clinical setting, however, the rate at which these tools are adopted is reportedly low (Manning et al., 2017). Dowling et al. (2019) noted that different reasons including lack of time and skills, the stigma associated with accepting tests, and slow development in brief screen instruments remain a challenge. Brief self-test tools have also been widely used in population research settings where there is a need for throwing a wider net to gather a meaningful sample of respondents (Volberg et al., 2011). Mainly operationalized as a sifting means-to-end tool, such a method of screening is considered cost-effective given the need to apply to a large population sample.

In the context of population-oriented applications, self-tests are used as RG tools among gambling operators, where they are commonly bundled with automated recommendation measures, normative feedback, and direction for further interventions based on test results. Their ease of use, fast feedback in the form of scores, and minimal training requirements mean

that gambling operators have widely adopted self-assessment tools as part of RG measures. The implementation of self-tests by gambling companies can be multifaceted including an early warning indicator (Jonsson et al., 2017), customer communication and player tracking systems, (Forsström et al, 2016), and basis for duty of care calls and treatment referral (Håkansson et al, 2022). For instance, the GamTest assessment score (Forsström et al., 2020) was used to identify and enroll problem gamblers into GamCare tier-based addiction treatment (Wyllie et al., 2023). In another trial featuring a longer, computer-delivered intervention, including SOGS and normative feedback for college students, Neighbors et al., (2015) observed a significant effect in reduced perceived norms for losses and wins, and in reduced actual loss and gambling problems after a 3-month follow-up.

Hence, there are strong indications that self-test tools can provide a means to identify and reduce harmful gambling behavior across clinical and population settings, at times with a long-term positive effect (Hodgins et al, 2019). In addition, players' perceptions of exposure to RG tools, including communication and self-test tools, are generally positive (Ivanova et al., 2019). There is, however, currently limited research that examined factors affecting the success of self-tests as RG measure, the low acceptance rate of self-test invites, and invite effect on players' future gambling behavior and use of other RG tools. Although we are aware of several studies that solely examine the nature and use of self-tests, these studies are mostly focused on validating instruments (Quilty et al., 2019; Rockloff et al., 2011), developing brief self-tests to accommodate contextual needs (Latvala et al., 2021), and identifying self-test best practice for different research settings (Merkouris et al., 2020). In its deployment stage, however, self-test tends to take a backseat while mainly serving a means-to-end utility (i.e., sifting participants to other measures). Even though this is not a problem per se, the current limitation of research around the nature and effects of self-tests limits our understanding of how self-tests work as RG tools. More research is needed, for example, to estimate the effect of being prompted to perform a self-test, and potential moderating factors such as test format, gambling behavior, or player age group; the latter since both responses to screening invite and performing the test have shown to be affected by age-related gambling behavior and wordings of test questionnaires (Derevensky et al., 2003; Dowling et al., 2019; Lepper & Haden, 2013).

Furthermore, research has shown that a relatively small number of users tend to take a self-test. A Norwegian population registry sample study, for example, found that out of 5,700 gamblers, only 4,9 % had performed a self-test (Engebö et al 2022). Reasons associated with such a low rate in both clinical and population settings can be traced to stigma associated with taking tests, gambling stereotypes, and RG discourse Miller & Thomas, 2018; Horch & Hodgins, 2013), as well as social desirability biases where the question of seeking gambling help can trigger a strong emotional reaction and a desire to save faces (Radermacher et al., 2016). Deemed

'irrelevant' to the research dataset, most participants who opt out of a self-test are discounted from follow-up observations. Given their number, together with the emotional apprehension that comes with exposure to RG measures, there is reason to investigate the effect of inviting gamblers to perform a self-test on future gambling behavior.

In addition to non-adhering participants, there is also limited research on the effect of self-test as RG measure on low-risk gamblers. Existing research suggests that many self-test tools are less sensitive identifying low-risk gamblers due to the historical influence of clinical discourse on problem gambling (Davies et al., 2022; Wickwire et al., 2008). Early detection of low-risk problem gambling is considered paramount for preventive approaches (Wardle et al., 2019). As such, it is important to understand the effect of self-test tools as RG measures on also recreational gamblers' gambling, including the possible influence of 'green' results on gambling more (Forsström et al., 2020). Finally, the field can benefit from more insight into factors influencing participants to perform or opt out of a self-test invite to improve the success of self-test as RG measure, including aspects such as the length of the test (Gainsbury et al., 2020).

Objective and hypothesis

The overall objective of the current study was to examine the effectiveness of self-test as an RG measure, in a real-life gambling setting. Specifically, in two separate studies, we investigated whether actively prompting gamblers through messaging leads to a greater number of started and completed self-tests compared to the standard approach of passively offering it through a link bar or the RG page (Study 1), and whether being prompted to do a standard or shortened self-test moderates RG tool use and gambling activity (Study 2). For the latter study, we had the following three hypotheses:

H1) Customers who receive a message that invites them to do a self-test (standard or short) will, on a group level, decrease their gambling more compared to controls.

H2) Customers that receive a message will use more RG tools than controls.

H3) The short self-test will have a higher degree of completion compared to the standard version.

Method

Study 1

Study 1 is an observational study with aggregated statistics provided by ATG, a Swedish gambling company with on- and off-line sport and horse betting, online casino, and bingo. We received Google Analytics data covering the period January-June 2023. Data included from what exposure source the self-tests were reached (link bar, message, or RG page), the number of clicks on the link bar, and the number of started self-tests and

finished self-tests. Action taken after self-test for all self-tests performed (not divided by exposure).

As part of their everyday operations, messages with a link to the self-test were sent to 149,629 customers during January 2023. Theoretically, all customers had the possibility to click on the link bar or visit the RG page by clicking on the self-test link.

Study 2

Setting, participants, and design

Study 2 was an A/B test (experiment) conducted at Svenska Spel Sport & Casino, a Swedish state-owned gambling company with on- and off-line sport and horse betting, online casino, poker, and bingo. All gambling requires a secure login, and all activity is registered. The sample consisted of 12,000 online customers at Svenska Spel Sport & Casino, half of whom were high-intensity consumers, randomly selected from the 71st-100th percentile, and half recreational consumers, randomly selected from the 40th-70th percentile. Percentiles were based on net losses in the last four weeks. Females constituted 17.5 % of the sample, and the mean age was 55 years (SD=14.5). The participants were randomized 1:1:1 to one of three arms: invitation to a standard self-test, invitation to a short self-test, or control (no invitation). After login, customers in the two intervention groups were presented with the same message on the screen inviting them to do an online self-test, see Figure 1. One group was administered the standard version of GamTest which features 15 items (Jonsson et al., 2017), with standard feedback provided. The other intervention arm was administered a short version of GamTest consisting of the five overconsumption statements, with GamTest feedback on the two overconsumption dimensions. The control group received no message.

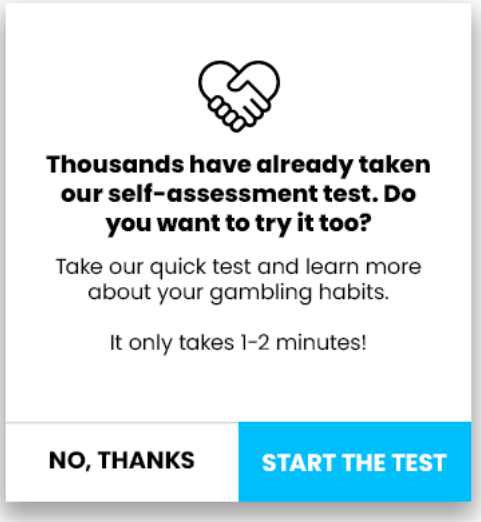

Figure 1. Invitation showed on screen to take a self-test. Translated from Swedish.

Ethical statement

The research described was approved by the Ethical Review Authority (number 2022-00822-01). The approval included the fact that the participants were not aware that they had been randomly assigned to one of three conditions, nor did they give any consent to participate since Svenska Spel performs A/B testing as part of their ordinary operations.

Measures and data collection

Data collection was performed on the third of July 2023 (a Monday). Self-test results from the intervention were collected at item level giving the possibility to see where drop-out occurred as well as results per dimension and total result. Gambling data and responsible gambling (RG) data on an individual level were collected for the four weeks before (pre) and four weeks (post) after intervention from Svenska Spel's data warehouse.

Gambling measures. The following gambling measures were collected from the data warehouse: the number of days played, net losses, theoretical loss (bet x 1-payback percentage), and time spent gambling. Analysis of net losses was made on the sample excluding those with a net win larger than 1000 SEK pre or post.

RG-measures. These RG measures were collected from the data warehouse: number of increased limits, number of lowered limits, monthly deposit limit day 7 every week, time self-excluded, number of self-exclusions, number of visits to "My gambling habits" (an RG hub with gambling feedback, limits, and recommendations), behavior (clicks) during visiting" My gambling habits" and performed self-test.

Data availability

Due to the nature of the research and commercial secrecy, supporting data is not available.

Statistical analysis

Data were analyzed in SPSS, Version 28. For Study 1, Chi-square was used to compare the start and finalization of tests between different exposure sources. In Study 2, hypothesis H1 (effect on gambling behavior) was tested using four separate repeated measures general linear models (time * group * gambler type) with theoretic loss, net expenditure, gambling days, or time spent (respectively) as outcome. Time was included as a factorial variable (pre and post). As we performed multiple statistical analyses, we set our alpha level at 0.0125 to reduce the Type-I error rate. To test H2 (use of RG tools), Chi-square was used to compare the groups' use of RG measures. For H3 (completion rates), Chi-square was used comparing those administered a standard and short self-test respectively. Chi-square was also used for analyzing use after invitation and the result of the test between groups.

Results

Study 1

A total of 76 078 self-tests were started during this period, of which 20 612 were finalized (27.1 %). As seen in Table 1, a significantly higher percentage of players who clicked the link bar started a test (26.2 %) compared to those receiving a message (15.7 %). Among players who initiated a self-test, completion rates were the highest with those who had been promoted by a message (66.2 %), followed by those who accessed the test via RG pages (32.9 %), and those who used the persistent link bar (9.2 %). When pooling all initiated tests, 67.8 % originated from the link bar, 1.3 % from RG pages, and 30.9 % from My messages. Due to a difference in finalizing rates, the link bar stood for 23.0 % of all finalized self-tests, RG-pages 1.6 % and My messages 75.4 %. For details, see Table 1. After completing the self-tests, the observed actions included visiting the limit-setting page (2.7 %), visiting the self-exclusion page (2 %), increasing a limit (1.8 %), decreasing a limit (1 %), and self-excluding from the casino (0.01 %).

Table 1. Number of customers exposed, started, and finished self-tests by exposure type and statistical contrast.

	Step 1: N exposed	Step 2: N started (of exposed)	N Finished (of started/exposed)
Link bar	196 881 clicked on the link	51 579 (26.2 %)	4 740 (9.2 %/2.4 %)
RG pages	Not applicable	1 020	336 (32.9 %)
Messages	146 629 received a message	23 479 (15.7 %)	15 536 (66.2 %/10.4 %)
Total		76 078	20 612

Statistical contrast		Step 1 vs 2: Chi-2 (1) = 5105, p<0.00001	Step 2 vs 3: Chi-2 (2) =26537, p= <0.00001

Study 2

Use after invitation

As seen in Table 2, around 6 % started a self-test when getting an invitation and 5.4-5.8 % completed it, with higher numbers among those invited to the short test. The recreational consumers did start and finish the test to a higher extent than the high consumers, 6.7 % vs 5.5 % started (Chi-2 (1) 5.00, n=8 000, p=0.028) and 6.1 % vs 5.1 % finished (Chi-2 (1) 4.00, n=8 000, p=0.046). Men used the self-test significantly more than women after being invited, 5.9 % finished vs 4.1 % (Chi-2 (1) 6.94, n=8 000, p=0.008).

Table 2. Percentage of started and completed self-tests.

	All (n=12000)			**High consumers** (n=6000)			**Recreational** (n=6000)			**Gender*** (n=8000)	
	Contr	Short	Stand	Contr	Short	Stand	Contr	Short	Stand	Women	Men
Started (%)	0.1	6.2	6.1	0.2	5.4	5.7	0.1	7.0	6.5	4.6	6.4
Completed (%)	0.1	5.8	5.4	0.2	5.1	5.0	0.1	6.4	5.8	4.1	5.9
% completed of started	100	92.7	88.5	100	95.3	87.7	100	90.7	89.1	89.1	90.8

* controls excluded.

As seen in Table 3, the lowest figures for start and completion are found in the youngest age group (18-25 years), and the highest in the oldest group (76 years and older).

Table 3. Number and percentage of started and completed self-tests by age-group.

Age group*	**18-25**	**26-35**	**36-45**	**46-55**	**56-65**	**66-75**	**76-**
n	218	682	1173	1728	2203	1447	549
Started (%)	4.1	4.8	4.5	5.7	6.9	6.5	9.5
Completed (%)	2.8	4.1	4.3	5.4	6.5	5.5	7.8
Completed of started (%)	66.7	84.8	96.2	95.9	95.4	84.0	80.8

Of the n=444 completed self-tests among gamblers in the intervention groups, 84.9 % were non-problematic, 13.1 % at risk, and 2.0 % problematic. There were no significant differences in results between the short and the standard test on the two over-consumption dimensions (Over

consumption money (OCT) Chi-2 (2) 3.98 n=444, p=0.137, Over consumption time (OCM) Chi-2 (2) .625, n=8 000, p=0.732, nor between the recreational and high consumers (OCM Chi-2 (2) .625, n=444, p=0.732, OCT Chi-2 (2) 2.84, n=444, p=0.732).

H1: Effect on gambling behavior

As seen in Table 4 below, there was no significant change (Time*Group) in theoretic loss, net expenditure, days played, or minutes played between those receiving an invitation and controls. H1 was thus not supported.

H2: Effect on use of RG-tools

There was a significant difference regarding visits at the RG site (Short 13.1 %, Long 13.8 %, Control 10.9 %, (Chi-2 (2) = 16.0, p<.001) but not in the use of any RG tools post-intervention. Thus, H2 was not supported. Around one-quarter of those performing a self-test took any RG action.

H3: Completion rate short and standard self-test

As reported above in Table 2, 5.8 % of the invited completed the short test and 5.4 % the standard test. The difference was not significant (Chi-2 (1, 8000)= 0.54, p=0.495). Thus, H3 was not supported.

Table 4. General linear models for theoretical loss (TL), net expenditure, days played, and minutes played.

Variable		Group Mean (SD) in SEK, days, and minutes respectively						GLM results		
		Long high	Short high	Control High	Long medium	Short medium	Control medium	Time*Group	Time*Type	Time*Group *Type
TL	Pre	969 (1758)	946 (1429)	922 (1364)	190 (326)	180 (323)	206 (455)	F(2)=1,83 P=.16	F(1)=6.70 P<.01	F(2)=1.29 P=.276
	Post	910 (1527)	962 (1727)	887 (1471)	201 (327)	202 (324)	238 (923)			
Net exp*	Pre	2131 (2393)	2214 (2623)	2209 (2522)	334 (347)	309 (268)	319 (268)	F(2)= 0.18 P= .831	F(1)= 178 P<.001	F(2)=0.36 P= .706
	Post	1820 (2254)	1866 (2316)	1852 (2717)	417 (729)	421 (658)	413 (726)			
Days played	Pre	17.7 (8.7)	17.3 (8.7)	17.4 (8.8)	10.4 (7.7)	10.5 (8.1)	10.7 (8.0)	F(2)=0.35 P=.705	F(1)=71.2 P<.001	F(2)=1.42 P=.243
	Post	16.4 (9.0)	16.0 (8.8)	16.3 (9.0)	9.9 (7.8)	10.1 (8.1)	10.1 (8.0)			
Minutes	Pre	551 (886)	513 (768)	514 (770)	204 (392)	205 (410)	207 (392)	F(2)=3.55 P=.029	F(1)=11.2 P<.001	F(2)=1.60 P=.201
	Post	522 (859)	518 (827)	514 (817)	217 (456)	232 (637)	216 (454)			

*Net expenditure: Excluding ≤ -1000 pre and ≤ -1000 post (N= 9 892)

Discussion

The primary aim of the two studies described was to examine key factors potentially influencing gamblers to complete a self-test, specifically how channeling route and presentation formats impact engagement. These formats included active promotion through messages containing links to the test, as well as (in Study 2) pop-up messages in two versions: a standard self-test and a shortened equivalent. Results from the first study suggest that self-test invitations sent via messages with a direct link to the test are the most effective, accounting for three-quarters of all completed self-tests. This was followed by a permanent link bar, which contributed to 23 % of finalized self-tests, and lastly, the RG page, which accounted for 1.6 %. Of those receiving a message, 15.7 % started a test, and two-thirds of those completed the test. All kinds of RG-action after the test were very low.

The results from Study 1 align with findings from human behavior research, which emphasizes the importance of strategic approaches to motivate actions and influence behavior (Fogg, 2002). For instance, significantly better self-test outcomes were achieved when players were provided with both a "trigger" (in the form of a message) and the "ability" (an action-promoting link) to complete the desired goal (taking the test). These conditions were not present in the other two settings (link bar or RG page), requiring significantly more cognitive effort and real-world clicks from the players. Consequently, the strategies used to encourage players to take a self-test are just as important as the test itself.

On the other hand, Study 2 found no effect on actual gambling behavior or the use of RG tools as a result of being invited on-screen to take a self-test. Additionally, there were no differences in completion rates between the standard and shortened tests. Of those invited, 6.1 % started a self-test and 90.6 % of those completed it. We speculate that, since 85 % of those exposed to the test intervention had a low-risk profile and a few tests were completed, it is not surprising that there was no effect on gambling behavior. Very few scored on a level that gave them feedback indicating problems that could motivate for change (Jonsson et al., 2017). And, for those exposed to the pop-up intervention, it was evident that an invitation with the option to easily skip the message (via a cancel button) appeared to be an ineffective way to nudge players into performing self-tests.

When closely examining the general tendency for self-test completion across both studies, different patterns emerged. First, in the case of "passive invitations mode," the link bar available on all pages across gambling operators in the Swedish market showed a remarkably low completion rate of only 2.4 %. However, customers who accessed the self-test through RG pages, despite relatively low visitation, had a higher completion rate. Second, in the "active invitation mode," messages sent on-site seemed to be more effective than on-screen messages. These results suggest that when players actively choose to take a self-test after having been prompted —whether via RG pages or by clicking on an email

invitation—completion rates are higher. Further research could explore whether the type of invitation that promotes voluntary participation influences the likelihood of completing a self-test.

The limited behavioral change observed following the self-test invitation may be partially explained by underlying psychological mechanisms that were not directly addressed by the intervention. One such factor can be the persistence of gambling-related cognitive distortions (e.g., erroneous beliefs about odds, control, and luck) that are well-documented among both recreational and problem gamblers (Williams et al., 2023; Armstrong et al., 2020). These distortions can buffer against the internalization of risk feedback provided by self-tests.

From a motivational standpoint, several factors may have reduced the effectiveness of the self-test invitation. Primarily, the gamblers visit a gambling site with the motivation to gamble and might perceive the invitation after logging in as disturbing (Binde 2013). Another possibility is that many participants, particularly recreational gamblers, may not have perceived their gambling as problematic and thus lacked readiness to change. Research on help-seeking behavior in gambling suggests that individuals often act only when they reach a personal or financial crisis, experience pressure from close relatives, or face relationship breakdowns (Dąbrowska et al., 2017; Rodda et al., 2017). Finally, the absence of follow-up prompts, or personalized messaging may have further contributed to the limited effect. Without reinforcement or continued engagement, any momentary reflection prompted by the self-test is likely to fade quickly—especially in high-tempo online gambling environments.

Finally, other findings from the current study align with results reported in the existing literature. For example, the lack of impact on self-test outcomes to prompt the use of other RG measures after completing a self-test, remains low, despite the recommendation for a call to action in the feedback provided post-test. This finding is consistent with previous research showing a general trend of low use of voluntary RG measures (Delfabbro & King, 2021; Engebö et al., 2022; Forsström et al., 2016). Additionally, the overall low completion rate of tests supports earlier studies (Engebö et al., 2022; Manning et al., 2017), which suggest that factors such as perceived stigma, stereotypes, and RG discourse (Miller & Thomas, 2018; Horch & Hodgins, 2013). Another potential explanation could be a mismatch between customers' expectations and experiences, partially influenced by how self-test invitations are framed. Further research is needed to explore strategies for providing more personalized RG recommendations based on individual self-test reports, as well as framing RG as a general safety net for the broader population to increase player participation.

In our study, there was a low number of self-tests indicating at-risk or problem gambling, with 85 % responding non-problematic. And surprising, there was no difference between the recreational customers and the high consumers. The latest Swedish prevalence study from 2021 showed

that 4.4 % of the gamblers playing at least monthly scored PGSI 3+, and another 10 % scored PGSI 1-2 (Swelogs, 2023). This suggests that there is an underreporting in our study; the non-significant difference between recreational customers and high consumers supports that interpretation.

Implications

One implication of this study is that, despite the low completion rate, the mandatory link bar still resulted in a substantial absolute number of self-tests being completed. This highlights that regulatory requirements can drive significant engagement at the population level simply by ensuring constant visibility and access. A further implication is that the number of completed self-tests at gambling platforms can likely be increased through other low-cost, scalable interventions, including adjustments to visibility, placement, and contextual timing. These findings point to the potential for simple interface-level measures to enhance uptake without relying on resource-intensive strategies.

While our findings do not directly test competing models of harm prevention, the limited behavioral impact of the self-test invitation may be viewed as consistent with critiques of individual responsibility frameworks. Interventions such as self-tests depend heavily on voluntary engagement, internal motivation, and users' willingness to act on feedback—all of which can be constrained by psychological, situational, or contextual factors. From this perspective, the modest effects observed in our study may underscore the limitations of relying solely on individual agency to reduce gambling-related harm. These findings align with broader arguments in the literature that support a public health approach—one that emphasizes system-level safeguards such as mandatory limits and reduced speed in play, designed to reduce harm across the entire gambling population, without requiring users to self-identify or opt-in (Harris & Griffiths, 2018; Newall, 2023; Sulkunen et al, 2021). While further research is needed to explore these implications more directly, our study adds to the growing recognition that structural changes to the gambling environment may be necessary to support population-level harm reduction.

Limitations and future research

First, Study 1 is descriptive in nature, which limits the depth of insight into the mechanisms underlying self-test use and subsequent behavior. While it provides useful information about patterns of uptake, it did not allow for examination of differences in outcomes between users who engaged with the self-test and those who did not. Study 2 may have been underpowered since we overestimated both what number of self-tests that would be performed after the invitation and the number of non-problematic tests to expect. The non-significant differences in subsequent gambling behavior may thus be a power issue; however, it may also be an effect of the four-week temporal aggregation used.

Another limitation of the study was the low rate of started self-tests, which may have influenced the overall impact of the intervention. As discussed above, several factors may account for this limited uptake. Psychologically, some users may have avoided the self-test due to discomfort or fear of receiving negative feedback. This aligns with the theory of selective exposure (Metzger et al., 2020), which suggests that individuals tend to avoid information that could trigger cognitive dissonance or evoke unpleasant emotions (Radermacher et al., 2016). Others, particularly recreational gamblers, may not have perceived the test as relevant to their behavior. Contextual factors may also have contributed, such as the timing or visibility of the test invitation, or skepticism regarding the platform's motives in offering the tool. In addition, the perception that self-tests are only intended for individuals with clear gambling problems may have further discouraged engagement. Future research should explore how self-tests can be more effectively embedded into user journeys—through improved timing, message framing, and trusted delivery channels—and whether follow-up prompts or personalized features can enhance uptake and impact.

Finally, this study identifies several key avenues for future research. First, longer follow-up periods are needed to assess whether behavioral change emerges over time, particularly among users who may initially resist acting on feedback but later adjust their behavior. This is particularly relevant for users who may initially resist acting on self-test feedback but could gradually internalize the information and adjust their behavior later. Second, future studies could explore the effectiveness of repeated invitations and alternative framings of both the invitation and the self-test, to better understand how language and context shape user engagement. Third, more research is needed to examine how different messaging strategies and presentation formats affect the uptake and perceived relevance of self-tests. In parallel, given gambling operators' duty of care obligations, further work is needed to evaluate how mandatory self-test interventions are implemented and whether enhanced framing and delivery can help these tools function as more effective components of harm reduction strategies. Finally, both qualitative studies and experimental research on gamified self-test formats could offer valuable insights into user perceptions and new engagement strategies.

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Statement of Competing Interests

JJ is an employee at Sustainable Interaction, a private company working with responsible gambling and online training with the gambling industry, reports past and ongoing industry-academia collaborations with several gambling providers, yet has no personal financial ties to the industry. PL is employed by the public-operated addiction clinic in Stockholm. NL and PL report past and ongoing industry-academia collaborations with several gambling providers, including project-specific financing, but have no personal financial ties to the industry, having received no honoraria. NL is a former employee of a fintech company that had gambling operators among its clients.

Author's contributions

JJ: Conceptualization, Funding acquisition, Investigation, Methodology, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. NL: Writing – original draft, review & editing. PL: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing.

Ethics Approval

The research described was approved by the Swedish Ethical Review Authority on March 2nd, 2022 (number 2022-00822-01). The approval included the fact that the participants were not aware that they had been randomly assigned to one of three conditions, nor did they give any consent to participate since Svenska Spel performs A/B testing as part of their ordinary operations.

Research Promotion

This study investigated how prompting online gamblers to take self-tests affects their gambling behavior and use of responsible gambling tools. Results from two studies showed that active messaging significantly increased self-test completions, but taking a self-test did not alter gambling behavior or use of RG measures. The findings suggest that simple, cost-effective strategies can boost self-test uptake among gamblers.

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