




Effectiveness of At-Risk Gamblers' Temporary Self-Exclusion from Internet Gambling Sites

J. Caillon^{1,2,3,4}  · M. Grall-Bronnec^{1,2} · B. Perrot² · J. Leboucher¹ · Y. Donnio¹ · L. Romo³ · G. Challet-Bouju^{1,2}

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Abstract

To prevent risks associated with online gambling, many jurisdictions propose self-exclusion strategies as a part of a responsible gambling policy. To protect online gamblers, French law provides for a 7-day temporary non-reducible and voluntary self-exclusion measure that applies only to select websites. The objective of our study was to evaluate the effectiveness of this self-exclusion measure for at-risk online gamblers. It was an experimental randomized controlled trial targeted at risk prevention. The main outcomes were the money wagered and time spent gambling assessed 15 days (short-term) and 2 months (medium-term) after the implementation of the self-exclusion measure. The effectiveness of self-exclusion was also compared according to the gambling type (pure chance games, such as lottery or scratch tickets, skill and chance bank games such as sports betting or horserace betting, and skill and chance games such as poker). Sixty participants were randomly assigned to the experimental condition ($n=30$; with the implementation of a self-exclusion measure) or control condition ($n=30$). The randomization was stratified according to their favorite game [pure chance games ($n=20$), skill and chance bank games ($n=20$), and skill and chance social games ($n=20$)]. The results revealed that self-exclusion had no short-term impact—but did have a medium-term impact—on gambling habits. After 2 months, the gambling-related cognitions (“illusion of control” and “the perceived inability to stop gambling”) and the subscale “desire” of the Gambling Craving Scale (GACS) have decreased. Participants’ opinions about the impact and effectiveness of self-exclusion were discussed. To conclude, it appeared that temporary self-exclusion is an interesting tool to protect online gamblers from excessive practices, but several modifications have to be made to improve its effectiveness and use.

Keywords Responsible gambling · Internet · Self-exclusion · Addiction · Gambling disorder

✉ J. Caillon
Julie.caillon@chu-nantes.fr

Extended author information available on the last page of the article

Introduction

The development of new technologies and the resulting widespread access to the Internet have enabled economic markets such as gambling to develop. Access to gambling (e.g., lottery, poker, sports betting and horse racing) has been facilitated, which has largely contributed to the expansion of gambling practices and acted as a corollary to regular or excessive gambling (Costes et al. 2015). Epidemiological studies on the prevalence of online gambling problems confirm the addictive potential of this activity with a high proportion of gambling problems on the Internet compared to land-based gambling venues (Costes et al. 2015; Griffiths 2011; Wood and Williams 2009).

To prevent risks associated with online gambling, many jurisdictions have proposed harm-minimization strategies as part of a responsible gambling policy. The aim of these strategies is to help gamblers, particularly at-risk gamblers maintain control over their gambling practice and prevent them from adopting more excessive forms of gambling. A variety of tools are proposed, including limit setting, “pop-up” messaging or self-exclusion (Harris and Griffiths 2016). The latter offers the possibility to gamblers who experience problems with their gambling practice to voluntarily ban themselves from entering one or more gambling venues (online or/and offline) during a pre-defined period (varying from a few days to a few years). Its application depends on the jurisdiction. Generally, government regulation provides gambling operators with the means to effectively enforce this measure and to restrict the entry to unbanned gamblers only (Gainsbury 2014). One example of such a mean, as is the case in France, is the implementation of a national identification system which automatically scan for the identity of the gambler at the entry of the gambling venue or at the registration to the gambling website, allowing for prohibiting banned gamblers to enter/register.

In France, the law that legalized online gambling in 2010 includes the obligation to propose preventive measures to protect vulnerable gamblers, comprising an obligation to provide online gambling moderators, such as the possibility to limit their bets and deposits or exclude themselves from the gambling website(s). Two types of self-exclusion programs are proposed. The first lasts 3 years, is non-reducible and can be implemented only by a legal action. The second is more flexible and applies only to online gambling after a simple request to the website. It lasts 7 days as a minimum, is non-reducible and applies only to websites selected by the gambler.

Despite the existence of self-exclusion strategies for gambling in many countries, few studies have been conducted to evaluate their effectiveness. The existing literature showed that the majority of participants benefited from self-exclusion programs but that these measures are under-utilized by problem gamblers (Gainsbury 2014; Kotter et al. 2018; McCormick et al. 2018). Positive effects on gambling behavior, problem gambling severity and psychosocial functioning were observed. However, conclusions were limited as a result of small and non-representative samples. Moreover, self-exclusion programs differed according to the jurisdictions, making the conclusions difficult to generalize. Only one study concerned self-exclusion from Internet gambling websites (Hayer and Meyer 2011). The results suggested that a temporary self-exclusion could have favorable effects on gambling problems. However, several limitations should be noted, such as the absence of a control group and including self-exclusion from one single gambling website.

The objective of our study was to evaluate the effectiveness of an online temporary and voluntary 7-day self-exclusion program for at-risk gamblers to decrease gambling behavior (money wagered and time spent), compared to a control group of at-risk gamblers who

did not implement the self-exclusion measure. A secondary objective was to evaluate the impact of this self-exclusion program on the severity of gambling problems, cognitive distortions and craving for at-risk gamblers, compared to the control group. The impact was assessed 15 days (short-term) and 2 months (medium-term) after the implementation of the self-exclusion procedure. The effectiveness was also compared according to the gambling type (pure chance games, such as lottery or scratch tickets, skill and chance bank games such as sports betting or horserace betting, and skill and chance social games such as poker) (Bjerg 2010; Boutin 2010). We excluded casino games such as slot machines because they are banned on the French Internet. They are considered to be more at risk of addiction by the regulatory authorities.

Methods

This study is a part of a research program aimed at determining the effectiveness of four types of gambling moderators: limiting bonuses, self-limitation, information and self-exclusion [for more detail, see (Caillon et al.2015)]. It is an experimental randomized controlled trial targeted at risk prevention and conducted with both non-problematic and at-risk gamblers.

Participants

For the present study about self-exclusion, we included only at-risk gamblers [scoring to 3–7 on the Problem Gambling Severity Index (PGSI) (Ferris and Wynne 2001)], as the self-exclusion measure is not intended for non-problematic gamblers. Other inclusion criteria were age 18 or older (gambling is forbidden to minors), currently gambling at least once during the past month on a website authorized licensed by ARJEL (an independent administrative authority specifically designed to regulate online gambling in France), and agreeing to give access to the gambling account data. Indeed, we had to check if the participant gambled during the experiment and this self-exclusion was only possible on legal websites. It was also necessary for the gambler to have a current playing practice to assess the changes in gambling behavior after the implementation of this measure. In order to protect the most vulnerable gamblers and avoid bias that could impact the results of the study, exclusion criteria were actually being under treatment for a gambling problem, being indebted, having used psychoactive substances on the day of the experiment, participating in another clinical study during the week preceding the experiment, being pregnant, being under protection (guardianship or curatorship), and having a history of psychosis or cognitive impairment.

Ethics

The participants were informed about the research and gave their written informed consent prior to their inclusion in the study. This study was approved by the French Research Ethics Committee (CPP) on January 8, 2013 (Trial registration number: NCT01789580).

Procedure

Participants were recruited through media announcements (newspapers, radio, and websites). In addition, we have subcontracted recruitment to survey institutes to obtain lists of potential participants. Volunteers were asked to contact the research team by email in order to obtain details on the study and arrange a telephone appointment to complete the pre-selection questionnaire. The recruitment was performed for the whole study between September 2013 and February 2017, and resulted in the inclusion of 450 participants.

Eligible participants completed a pre-test interview prior to the experiment (T0) to collect the following information: sociodemographic data, gambling characteristics, severity of cognitive distortions, craving, severity of gambling problems, opinion and use of online gambling protections and gambling account information.

The participants were then randomly assigned to one sub-study (limiting bonuses, self-limitation, information or self-exclusion). In the present work, only data from the “self-exclusion” sub-study were analyzed ($n=60$). For the sub-study “self-exclusion”, participants were randomly assigned to the experimental condition ($n=30$) or the control condition ($n=30$). The randomization was stratified according to their favorite game [pure chance games ($n=20$), skill and chance bank games ($n=20$), and skill and chance social games ($n=20$)].

In the experimental condition, the gamblers were asked to implement the self-exclusion procedure on their favorite websites. The self-exclusion was set up during the pre-test interview with the help of the interviewer. At the end the non-reducible self-exclusion period of 7 days, gamblers had the choice to voluntarily extend the ban or not (with no action from the interviewer). In the control condition, the participants gambled as usual.

Two post-test interviews were conducted by phone 15 days (T1) and 2 months (T2) after the implementation of the self-exclusion measure. The same information as in the pre-test was collected in the post-test interviews. Moreover, the impact of self-exclusion on gambling behavior was also questioned for self-exclusion participants.

Measures

In both groups, we collected information about the participants and their gambling habits, both in qualitative and quantitative way. On the one hand, quantitative methods gave us access to the objective level of gambling activity and problems, and level of craving and cognitive distortions. On the other hand, qualitative methods provide us with access to much more personal perspectives and to enhance the depth of the investigation. Such methods were used to collect the participants’ opinions on the harm-minimization tools, to generate much richer data than do quantitative methods.

We collected the following information:

- Socio-demographic data.

Socio-demographic data were collected: age, sex, marital status, education level, and employment status.

- Gambling characteristics.

Information was collected about gambling: age of initiation, gambling habits (type of game, frequency, and money wagered) and motivation to gamble.

- Gambling problems.

Participants were asked about the age at which the behavior became problematic, damages caused by the gambling and the feeling of a loss of control using a Likert-type scale from 0-not at all to 10-extremely.

- Moderators (qualitative method).

Participants were asked about their opinions, use and impact of moderators.

- Impact of self-exclusion on gambling behavior (experimental condition only).

Participants were asked about the impact of the self-exclusion measure: continuation of gambling during self-exclusion, gambling habits since the end of the measure, and opinions on self-exclusion (qualitative method).

In order to obtain quantitative information to evaluate the impact of the temporary self-exclusion on gambling behavior, we collected the following information:

- Gambling account information.

Gambling account data provide objective information on money wagered and time spent. The reference period taken into account concerned the last 7 active days (an active day was a day in which the participant gambled at least once).

- Severity of cognitive distortions.

We evaluated the cognitive distortions with the 23-item Gambling Related Cognitions Scale (GRCS) (Grall-Bronnec et al. 2012; Raylu and Oei 2004). It explored five dimensions: interpretative control/bias (GRCS-IB), illusion of control (GRCS-IC), predictive control (GRCS-PC), gambling-related expectancies (GRCS-GE) and perceived inability to stop gambling (GRCS-IS).

- Severity of gambling problems.

PGSI is a 9-item scale derived from the 31-item Canadian Problem Gambling Index (CPGI) originally developed by Ferris and Wynne (2001). A score of 3–7 defines an at-risk gambler with a moderate level of problems leading to some negative consequences and a score of 8 or more defines a problem gambling with negative consequences and a possible loss of control.

- Craving.

The Gambling Craving Scale (GACS) was also used (Young and Wohl 2009). It is a 9-item questionnaire specific to craving gambling and validated in French. The patient is asked to indicate whether he agrees with the item titles on a 7-point scale (1: strongly disagree, 7: strongly agree). The analysis of the structure of this questionnaire includes three

dimensions, each represented by three items: “anticipation” (an intention to gamble that was anticipated to be fun and enjoyable), “desire” (strong and urgent desire to gamble) and “relief” (an expectation that gambling would provide relief from negative affect).

Data analysis

Statistical analysis was performed using the Stata 14 software (StataCorp LP, College Station, TX). Continuous variables were expressed as the mean \pm standard deviation or as median (25th–75th percentiles) when describing non-normal data. Categorical variables were expressed as a number (percentage). ANOVAs were performed to compare the money wagered and time spent gambling between the pre-test and post-tests. In a first ANOVA, the dependent variable was defined as the difference in daily money wagered between the pre-test period and the first post-test (15 days); in a second ANOVA, the dependent variable was defined as the difference in time spent gambling between the pre-test and first post-test. Similarly, two other ANOVAs were performed to compare evolutions between the pre-test and the second post-test (2 months). In the four models, variables were the randomization group (control or experimental) and the favorite game (pure chance games, skill and chance bank games, and skill and chance social games). The interaction between these two factors was also studied. When the interaction term was significant, pairwise comparisons were adjusted using Bonferroni correction. Supplementary ANOVAs were performed according to the same design to compare the evolution of GRCS, GACS and CPGI scores. Besides ANOVA post hoc analyses, we did not correct for multiple testing.

Results

Description of the Whole Sample

Socio-Demographic Data

In both groups, the majority of participants included were men (73.3%) aged 18–65 years. The average age of subjects was 35.2 years. The majority of gamblers (83.3%) had an educational level equal to or higher than a high school diploma; 61.7% lived with a partner, 25% alone and 10% with their parents. More than half had a professional activity (66.7%), 16.7% did not work, 11.7% were students, and 3.3% were retired.

Gambling Habits

In both experimental and control groups, the majority of participants (68.3%) gambled at least once per week, and 21.7% gambled every day or almost every day. On average, they gambled 3 times a week, and each gambling session lasted 59 min. The gambling time per session varied depending on the type of game: from 13 min for a gambler of pure-chance games to 142 min for a poker player.

Among all gamblers, 78.3% gambled only on one gambling website, 16.7% gambled on 2 websites and only 5% gambled on 3 websites. In addition, 58.3% gambled on a single type of game on the Internet and 33.3% did so in several games, but with a game of prediction. Only 3.3% admitted having already gambled on sites not authorized by the French government.

One-third of the participants (33.3%) gambled only online. They had already gambled offline with money; the average age of initiation was 14.4 years.

The first motivation to gamble online was to make money (70.0%). Second, 58.3% gambled online for the fun and excitement of the game. No participants gambled to relieve negative affect.

On average, participants spent 196.8 euros per month on online gambling.

Gambling Problems

While 58.3% of all the participants never felt that they had a problem with gambling, 23.3% experienced some kind of problem in the past and 18.3% did so at the moment.

Among those who experienced gambling problems, 16% planned to stop gambling. The others believed that their gambling practice is not a problem (56%) or that it would be too difficult for them to stop gambling (28%).

Recognition of the gambling problem occurred at the age of 29 years on average. The most frequently reported negative consequences were the impact on mood (anxiety, stress, and depression) (21.7%), time spent gambling (15%) and money spent (15%). Gambling had no negative consequences for 60% of the participants.

Opinion and Use of Moderators

Detailed results are given in Table 1.

Two-thirds of the participants of both groups (66.7%) knew at least one gambling moderator. Among them, the least-used moderator was voluntary temporary self-exclusion (1.7%).

When questioned about the most effective moderators for protecting vulnerable gamblers and reducing the risk of excessive gambling, participants first identified self-limiting money (65%), which was closely followed by self-exclusion (61.7%).

Comparison of “T0–T1” Evolution (15 days) Between the Experimental Group and the Control Group

The results are given in Table 2.

We did not demonstrate any significant difference between the experimental group and the control group in terms of the evolution of money wagered, time spent, craving for gambling and cognitive distortions.

However, gamblers in the experimental group reported that this self-exclusion period had an impact on their gambling habits and on their perceptions. No gambler pursued self-exclusion after the mandatory 7 days.

Table 1 Participants’ use of and opinions about mandatory moderators

Mandatory moderators	Use (%)	Opinion (%)
Checking the account balance	88.3	33.3
Self-limitation (money)	86.7	65
Self-limitation (time)	3.3	43.4
Self-exclusion	1.7	61.7

Table 2 ANOVA results for differences between the pre-test (T0) and 1st post-test (T1; 15 days)

	Control group (marginal group mean)				Self-exclusion group (marginal group mean)				ANOVA effects (<i>p</i> value)			
	PCG	SCBG	SCSG	Mean	PCG	SCBG	SCSG	Mean	Self-exclusion	Type of game	Self-exclusion* type of game	Significant planned pairwise comparisons
Money	- 8.91	- 17.40	- 12.77	- 13.03	- 10.56	- 14.95	- 24.12	- 16.28	0.535	0.429	0.601	-
Time spent	- 2.00	- 4.30	- 37.67	- 13.86	- 7.95	- 7.30	- 41.78	- 18.22	0.817	0.245	0.998	-
GRCS												
GRCS-GE	- 0.40	1.40	0.00	0.32	- 0.80	- 1.22	- 0.40	- 0.80	0.192	0.809	0.489	-
GRCS-IS	- 2.40	2.40	- 0.40	- 0.18	- 2.70	- 0.33	- 0.80	- 1.29	0.187	0.005	0.434	-
GRCS-IC	0.00	1.50	1.40	0.96	- 1.30	0.11	- 0.80	- 0.68	0.062	0.378	0.893	-
GRCS-PC	- 2.11	0.40	2.60	0.30	- 2.40	- 1.44	- 2.44	- 2.10	0.068	0.314	0.313	-
GRCS-IB	- 4.50	1.20	2.10	- 0.43	- 3.50	- 3.00	- 2.10	- 2.86	0.054	0.029	0.154	-
GACS												
GACS-Anticipation	- 0.70	- 0.50	0.70	- 0.16	- 0.40	0.67	1.20	0.49	0.510	0.460	0.933	-
GACS-Desire	- 0.40	1.50	2.30	1.13	- 0.60	0.89	1.70	0.66	0.512	0.018	0.964	-
GACS-Relief	0.40	1.20	1.40	1.00	0.90	0.67	0.80	0.79	0.795	0.898	0.822	-

PCG Pure chance games, SCBG skill and chance bank games, SCSG skill and chance social games

Bold values indicate statistical significance $p < 0.05$

A single gambler regretted having engaged in self-exclusion because “he was slightly annoyed by not to being able to play”, but the majority found that the experience was positive. This period of “forced” abstinence allowed them to take a break, to take stock of their practice, and to do other things. During the 7 days of self-exclusion, no participant gambled on other websites.

Since their resumption of gambling play, the majority of gamblers in the experimental condition believed that self-exclusion allowed them to move away from gambling by reducing the time spent gambling or gambling differently (less in the lure of gain, awareness of the low chances of gain, etc.). Few gamblers (10%) believed that the impact of self-exclusion was negative and that they gambled more since the end of self-exclusion. As a result of their self-exclusion experience, the majority of participants (93%) thought this moderator had an interest in protecting gamblers and in reducing the addictive risk. According to them, this tool would help to stop gambling in the case of a loss of control and to increase awareness of their gambling practice: “It takes only a moment of lucidity to take a break”. Nevertheless, many limitations have also been noted. Self-exclusion was a moderator little known by the gamblers and even when used, this measure did not prevent them from gambling elsewhere (online or offline). For many, addicted gamblers would not use this moderator if they were not accompanied because “when you really want to gamble, you do not use this”.

Comparison of “T0–T2” Evolution (2 months) Between the Experimental Group and the Control Group

The results are shown in Table 3.

No significant difference between the experimental group and the control group regarding the evolution of money wagered, time spent, craving for gambling, cognitive distortions and severity of gambling problem was demonstrated.

The results revealed that participants in the self-exclusion condition and control condition significantly differed in two dimensions of the GRCS: GRCS-IS ($p=0.039$) and GRCS-IC ($p=0.048$). Gamblers in the self-exclusion condition reported a higher decrease in the degree of gambling-related cognitions after 2 months than gamblers in the control condition (GRCS-IS: -2.67 vs. 0.19 ; GRCS-IC: -1.09 vs. 0.97). There was also a significant difference between the two groups regarding the evolution of craving, with a higher decrease in the desire subscale of the GACS ($p=0.049$) for the self-exclusion group (-0.33) than for the control group (1.12).

Discussion

The objective of this study was to evaluate the effectiveness of an online temporary self-exclusion measure for at-risk gamblers to decrease gambling behavior (money wagered and time spent) compared to a control group. A secondary objective was to evaluate the impact of this self-exclusion on severity of gambling problems, cognitive distortions and craving for at-risk gamblers compared to a control group. Fifteen days after the setup of the self-exclusion procedure, the results showed that self-exclusion had no objective short-term impact on gambling habits, craving for gambling, cognitive distortions and severity of gambling problems. Nevertheless, it is important to stress that the majority of gamblers

Table 3 ANOVA results for differences between the pre-test (T0) and 2nd post-test (T2: 2 months)

	Control group (marginal mean)				Self-exclusion group (marginal mean)				ANOVA effects (<i>p</i> -value)			
	PCG	SCBG	SCSG	Mean	PCG	SCBG	SCSG	Mean	Self-exclusion	Type of game	Self-exclusion* type of game	Significant planned pairwise comparisons
Money	-6.28	-9.06	-9.24	-8.13	-9.62	-15.40	-16.99	-13.85	0.073	0.359	0.842	-
Time spent	-2.05	-7.80	-22.67	-10.30	-8.60	-2.22	-73.88	-26.69	0.269	0.046	0.316	-
GRCS												
GRCS-GE	-0.70	-0.89	0.10	-0.50	-2.90	-1.70	-3.22	-2.61	0.086	0.943	0.702	-
GRCS-IS	-2.10	3.00	-0.20	0.19	-5.70	0.40	-2.56	-2.67	0.039	0.005	0.922	-
GRCS-IC	-0.20	1.78	1.40	0.97	-2.50	1.20	-1.89	-1.09	0.048	0.079	0.553	-
GRCS-PC	-4.22	-1.67	-0.20	-2.06	-5.10	-0.60	-3.37	-3.02	0.563	0.205	0.604	-
GRCS-IB	-4.50	-0.78	1.10	-1.44	-4.60	-1.50	-2.22	-2.81	0.340	0.055	0.626	-
GACS												
GACS-Anticipation	-1.30	-1.11	0.80	-0.55	-3.00	-2.90	-1.11	-2.35	0.227	0.474	0.998	-
GACS-Desire	0.20	1.22	2.00	1.12	-0.60	-0.50	0.11	-0.33	0.049	0.374	0.803	-
GACS-Relief	0.90	1.22	1.30	1.14	-0.30	0.40	1.33	0.46	0.482	0.674	0.859	-
PGSI	-3.40	-1.89	-1.80	-2.38	-3.10	-1.30	-2.33	-2.26	0.830	0.046	0.692	-

PCG Pure chance games, SCBG skill and chance bank games, SCSG skill and chance social games

Bold values indicate statistical significance $p < 0.05$

acknowledged that this experience was interesting and allowed them to think about the role of gambling in their lives.

The impact of self-exclusion was greater in the medium term. After 2 months, the “illusion of control” and the “perceived inability to stop gambling” decreased more for gamblers who had experienced a 7-day self-exclusion. Cognitive distortions play an important role in the development and maintenance of problem gambling. Cognitive distortions are correlated with the level of practice. Therefore, a reduction in these distortions could indirectly reduce gambling habits. In particular, it was demonstrated that the perceived inability to stop gambling and the illusion of control were good predictors of pathological gambling (Barrault and Varescon 2013). Illusion of control means that excessive gamblers gain the conviction that they can control the outcome of the game. This trap leads many gamblers to persevere in the game despite financial losses (Ladouceur et al. 2002). Our results indicated that a period of abstinence was a way to decrease the illusion of control. In addition, self-exclusion appeared to reinforce self-efficacy (Bandura 1977), as the perceived inability to stop gambling decreased after experimentation with a 7-day self-exclusion period. Self-efficacy refers to cognitions about the individual’s ability to competently cope with challenges and high-risk situations in life. High levels of self-efficacy would be associated with abstinence or control, while low levels would correlate with relapse (Marlatt 1985). Oei and Goh (2015) demonstrated that self-efficacy was a protective factor against problem gambling (Oei and Goh 2015). If a person believes that he is incapable of controlling his craving, he is less likely to try to control it. Therefore, these two dimensions of cognitive distortions are two important factors that promote behavioral change. In fact, behavioral change requires a sense of perceived vulnerability and personal self-efficacy (Ajzen 1991).

After 2 months, we also observed a decrease in the desire dimension of the GACS. This impression was also described by some participants during the post-test interview. It was well established that craving is implicated in the maintenance of addictive behavior (Marlatt 1985). Craving significantly predicted gambling persistence in the face of repeated losses. A decrease in gambling desire could help gamblers regain control of gambling behavior. In fact, as explained by Young and Wohl (2009), winning expectancies might be associated with the desire dimension of the GACS (Young and Wohl 2009). Should an individual expect to win, it is likely that he will also desire gambling. Therefore, a decrease in the illusion of control dimension of the GRCS could lead to a decrease in the desire dimension. Overall, participants found that this experience was positive. Except for one gambler, the frustration associated with the inability to gamble did not result in an increase in gambling behavior at the end of the 7 days of exclusion or in a switch to other gambling practices during the self-exclusion period. Nevertheless, the intention to gamble dimension that included anticipation of being fun and enjoyable increased non-significantly in self-excluded participants, unlike the other dimensions of the GACS. This effect may be related to the frustration of not being able to gamble as a way to replace missed gambling sessions, especially since the second motivation to gamble described by the participants was fun and excitement. This phenomenon also addresses the psychological reactance used in order to maintain freedom of action in the face of a restrictive and imposed measure (Brehm 1981). As demonstrated by Blaszczynski et al. (2016), breaks in play can be counterproductive if gamblers are not accompanied.

Therefore, a period of abstinence—even if it is short—seems to be profitable, which makes it possible to modify beliefs in the medium term at both the cognitive (illusion of control) and emotional (perceived inability to stop gambling) levels, which has the consequence of diminishing the desire to play and to prevent the transition from at-risk gambling to problem gambling. As demonstrated by Bruneau et al. (2016), having experienced

at least 1 month of abstinence in the previous year seemed to be a protective factor for problem gambling. Other modalities of self-exclusion procedure could include experiments (with 7-day abstinence versus 1-month abstinence, for example) to compare their effectiveness in mitigating gambling problems, which could improve their impact.

Despite these interesting results, no significant change was observed for the money wagered, time spent gambling, or the severity of problem gambling (T2). Several assumptions can thus be made. The participants in the control group were also monitored, which could have changed their gambling practices (white-coat effect). Moreover, a 7-day duration could represent an excessively short period of abstinence for a profound change in gambling behavior. For example, Hayer and Meyer's study (Hayer and Meyer 2011) on self-exclusion on the Internet was carried out for longer durations (1–12 months) and demonstrated positive effects on gambling behavior. In addition, in self-exclusion studies (Gainsbury 2014), self-exclusions were voluntary. In our research, the measure was imposed, and motivation to stop gambling was therefore likely less important. Despite their at-risk status, the majority of the gamblers included did not consider gambling to be a problem for them which could have an impact on the results. Generally, this raises the question of the effectiveness of this type of measure for problem gamblers with low motivation to change or in denial, and for those who have the hope of winning money or of the thrill of the chase. Finally, the recruitment took a long time during which the online gambling landscape in France was likely to change, so that it may have influenced the results. Indeed, online gambling practices have increased in France during this period (Costes et al. 2015). However, there was no change in the legislative framework of the self-exclusion procedure.

These limitations were highlighted by the participants themselves. Although they thought that this measure is very important for protecting vulnerable gamblers, they also highlighted that its implementation would be very difficult for them without accompaniment. In this context, the early identification of gamblers at-risk of excessive gambling may represent an interesting opportunity to disseminate appropriate prevention messages adapted to the gambler's needs (Perrot et al. 2017). In particular, the promotion and accompaniment of temporary self-exclusion could be proposed to at-risk gamblers rather than letting them take this initiative themselves. Indeed, and as the participants noted themselves, self-exclusion is a measure that is unknown by the majority of gamblers and that is difficult to undertake oneself from a motivational point of view. Information about the existence of this measure and its potential benefits could facilitate its use by gamblers and limit the risk of excessive gambling. As underlined by several authors (Nowatzki and Williams 2002; O'Neil et al. 2003), it seems that the gambling industry does not promote this type of program, which can explain why gamblers were not aware of this measure. Participants also noted that despite this self-exclusion measure, it was still possible to gamble on other websites or offline. The majority of the gamblers interviewed also gamble in land-based venues. It would thus be more effective for gamblers to self-exclude from multiple venues in one step. As Gainsbury and Kotter suggested (Gainsbury 2014; Kotter et al. 2018), an interesting alternative could be that a legal authority manages self-exclusion for all venues (online and offline) with the support of health services to accompany gamblers. For example, in France, there are two types of self-exclusion programs. The first one applies only in one gambling website at a time and lasts 7 days (the one being under study in the present paper). The other one is a national Gambling Self-exclusion File supervised by the Ministry of the Interior. The gambler signs a real contract. The gambling ban is irrevocable for the time period covered (3 years) and is applies to all casinos and legalized gambling websites (since 2010). Unlike many countries, each French casino must use an identification system that restricted the entry to unbanned adult gamblers only. Identity is also checked

when gamblers register on a French gambling website. So, it's technically possible to set up an identification system that restricts the access to gambling to authorized gamblers only. However, as Blaszczynski et al. (2007) explained, mandating such a system seems complicated in many jurisdictions, especially in countries where accessibility to games is very important in bars, stores or restaurants (Blaszczynski et al. 2007).

We also observed that the effectiveness of self-exclusion did not vary according to the type of game. If there were clear differences in gambling habits, such as the time spent gambling, they had no impact on the effectiveness of the moderator. It would therefore not be necessary to adapt this moderator to the type of game.

Finally, several limitations that may have had an influence on the results obtained must be highlighted. Our sample is quite small, and it might be interesting to replicate this study with more participants. In addition, our sample was made up of at-risk gamblers who may not subjectively experience any difficulty with their gambling practice. This may have modified the impact of self-exclusion, which is intended to be implemented voluntarily. Even though this measure is of great interest to prevent excessive gambling among at-risk gamblers, this type of tool seems unsuitable for pathological gamblers who have lost control of their gambling behavior and are experiencing severe damage as a result of their gambling practice. For the latter, a wider measure of exclusion with a longer duration and a broader application (offline and online) would be more beneficial and should be implemented within the framework of care. Despite these limitations, this study is an original, controlled and randomized study with a representative sample that has also yielded very informative qualitative data. The gamblers interviewed had similar characteristics to the profile of Internet gamblers of the French prevalence survey (Costes et al. 2015): mainly men who are younger, better-educated and more active than off-line players. This similarity supports the representativeness of our sample, despite the limited sample size.

Conclusion

A temporary self-exclusion on Internet gambling sites did not modify short-term gambling habits but had an impact on gambling cravings, on cognitive distortions and on several subjective measures in the medium term. If these results are important for initiating a behavioral change, it is therefore possible that the duration of self-exclusion proposed is too short to strongly modify gambling behavior, and an effect could have been observed with a longer follow-up duration. This moderator was very little known and little used by gamblers; thus, it would be important that the operators inform and accompany the gamblers in its implementation. Indeed, it seems difficult for a gambler experiencing trouble as a result of his gambling to be able to set up this type of measure alone. It would be interesting in the future to link self-exclusion programs to professional addiction support services and to an early identification of at-risk gamblers to adapt the information to each profile (personalized intervention). Moreover, an interesting measure would be to implement a personalized follow-up of the gambling practices throughout self-exclusion and after to confirm the benefits for the gambler and to strengthen the use of this measure in the case of further loss of control (individual-centered approach). At the same time, it seems essential to test other modalities of this tool, which is very interesting in a harm-reduction perspective but is perfectible.

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Compliance with Ethical Standards

Conflict of interest JC, MGB, GCB and LR declare that the University Hospital of Nantes and The Paris Nanterre University have received funding from gambling industry (FDJ and PMU) in the form of a sponsorship—this funding has never had any influence on the present work. Scientific independence towards gambling industry operators is warranted.


Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191.
- Barrault, S., & Varescon, I. (2013). Impulsive sensation seeking and gambling practice among a sample of online poker players: Comparison between non pathological, problem and pathological gamblers. *Personality and Individual Differences*, 55(5), 502–507.
- Bjerg, O. (2010). Problem gambling in poker: Money, rationality and control in a skill-based social game. *International Gambling Studies*, 10(3), 239–254.
- Blaszczynski, A., Cowley, E., Anthony, C., & Hinsley, K. (2016). Breaks in play: Do they achieve intended aims? *Journal of Gambling Studies*, 32(2), 789–800.
- Blaszczynski, A., Ladouceur, R., & Nower, L. (2007). Self-exclusion: A proposed gateway to treatment model. *International Gambling Studies*, 7(1), 59–71.
- Boutin, C. (2010). *Le jeu: chance ou stratégie ? Choisir librement la place du jeu dans votre vie*. Montréal.
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. New York: Academic Press.
- Bruneau, M., Grall-Bronnec, M., Venisse, J. L., Romo, L., Valleur, M., Magalon, D., et al. (2016). Gambling transitions among adult gamblers: A multi-state model using a Markovian approach applied to the JEU cohort. *Addictive Behaviors*, 57, 13–20.
- Caillon, J., Grall-Bronnec, M., Hardouin, J. B., Venisse, J. L., & Challet-Bouju, G. (2015). Online gambling's moderators: how effective? Study protocol for a randomized controlled trial. *BMC Public Health*, 15, 519.
- Costes, J. M., Eroukmanoff, V., Richard, J. B., & Tovar, M. L. (2015). Les jeux d'argent et de hasard en France en 2014. In *Les notes de l'Observatoire Des Jeux* Retrieved Avril, from http://www.economie.gouv.fr/files/files/directions_services/observatoire-des-jeux/Note_6.pdf. Accessed 10 Sep 2017.
- Ferris, J., & Wynne, H. (2001). *L'indice canadien du jeu excessif: Rapport final*. Ottawa: Centre canadien de lutte contre l'alcoolisme et les toxicomanies.
- Gainsbury, S. M. (2014). Review of self-exclusion from gambling venues as an intervention for problem gambling. *Journal of Gambling Studies*, 30(2), 229–251.
- Grall-Bronnec, M., Bouju, G., Sébille-Rivain, V., Gorwood, P., Boutin, C., Vénisse, J. L., et al. (2012). A French adaptation of the Gambling-Related Cognitions Scale (GRCS): A useful tool for assessment of irrational thoughts among gamblers. *Journal of Gambling Issues*, 27, 1–21.
- Griffiths, M. D. (2011). Internet gambling: Preliminary results of the first U.K. prevalence study. *Journal of Gambling Issues*, 5, 1–9.
- Harris, A., & Griffiths, M. D. (2016). A critical review of the harm-minimisation tools available for electronic gambling. *Journal of Gambling Studies*, 33(1), 187–221.
- Hayer, T., & Meyer, G. (2011). Internet self-exclusion: Characteristics of self-excluded gamblers and preliminary evidence for its effectiveness. *International Journal of Mental Health and Addiction*, 9(3), 296–307.

- Kotter, R., Kräplin, A., Pittig, A., & Bühringer, G. (2018). A systematic review of land-based self-exclusion programs: Demographics, gambling behavior, gambling problems, mental symptoms, and mental health. *Journal of Gambling Studies*, *34*, 1–28.
- Ladouceur, R., Sylvain, C., Boutin, C., & Doucet, C. (2002). *Understanding and treating the pathological gambler*. London: Wiley-Blackwell.
- Marlatt, G. A. (1985). Relapse prevention: Theoretical rationale and overview of the model. In G. A. Marlatt & J. R. Gordon (Eds.), *Relapse prevention: Maintenance strategies in the treatment of addictive behaviors* (1st edn., pp. 3–70). New York: Guilford Press.
- McCormick, A. V., Cohen, I. M., & Davies, G. (2018). Differential effects of formal and informal gambling on symptoms of problem gambling during voluntary self-exclusion. *Journal of Gambling Studies*. <https://doi.org/10.1007/s10899-018-9743-5>.
- Nowatzki, N. R., & Williams, R. J. (2002). Casino self-exclusion programmes: A review of the issues 1. *International Gambling Studies*, *2*(1), 3–25.
- Oei, T. P. S., & Goh, Z. (2015). Interactions between risk and protective factors on problem gambling in Asia. *Journal of Gambling Studies*, *31*(2), 557–572.
- O’Neil, M., Whetton, S., Dolman, B., Herbert, M., Giannopolous, V., O’Neil, D., et al. (2003). *Part A evaluation of self-exclusion programs in Victoria and Part B summary of self-exclusion programs in Australian states and territories*. Melbourne: Gambling Research Panel.
- Perrot, B., Hardouin, J.-B., Costes, J.-M., Caillon, J., Grall-Bronnec, M., & Challet-Bouju, G. L. (2017). Study protocol for a transversal study to develop a screening model for excessive gambling behaviours on a representative sample of users of French authorised gambling websites. *British Medical Journal Open*, *7*(5), e014600.
- Raylu, N., & Oei, T. P. (2004). The Gambling Related Cognitions Scale (GRCS): Development, confirmatory factor validation and psychometric properties. *Addiction*, *99*(6), 757–769.
- Wood, R. T., & Williams, R. J. (2009). *Internet gambling: Prevalence, patterns, problems, and policy options*. Guelph: Final Report prepared for the Ontario Problem Gambling Research Centre.
- Young, M. M., & Wohl, M. J. (2009). The Gambling Craving Scale: Psychometric validation and behavioral outcomes. *Psychology of Addictive Behaviors*, *23*(3), 512–522.

Affiliations

J. Caillon^{1,2,3,4}  · M. Grall-Bronnec^{1,2} · B. Perrot² · J. Leboucher¹ · Y. Donnio¹ · L. Romo³ · G. Challet-Bouju^{1,2}

¹ Addictology and Psychiatry Department, CHU Nantes, Nantes, France

² INSERM, SPHERE U1246 «Biostatistics, Pharmacoepidemiology and Human Science Research», Nantes University, Tours University, Nantes, France

³ EA 4430 CLIPSYD «Clinical Psychology, Psychoanalysis and Development», Paris Nanterre University, Nanterre, France

⁴ IFAC – CHU de Nantes – Hôpital St Jacques, Bâtiment Louis Philippe, 85 rue St Jacques, 44093 Nantes Cedex 1, France