Predictors of Gamblers Beliefs About Responsible Gambling Measures

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Abstract

Responsible gambling (RG) measures are methods aimed at reducing and preventing negative consequences associated with gambling. Some RG measures are set by authorities or gambling operators while others are available as features for gamblers to use themselves (e.g. budget tools where personal monetary limits are set prior to gambling). The present study is based on a general gambler population and investigates how RG measures with some specific RG features are assessed by the gamblers. The data was collected in 2013 and 2015. The samples were drawn from the Norwegian Population Registry. In total 9129 gamblers participated. Gamblers were asked to state to which degree they agreed that ten specific RG measures help or would help them controlling their gambling. Overall, between 35 and 42% neither agreed nor disagreed, but among those with an opinion, most agreed. A multiple regression analysis identified eleven variables as significant predictors of positive beliefs about RG measures: female gender, young age, playing random games only, being a moderate risk or problem gambler, reporting high impact from gambling advertisements as well as the personality traits agreeableness, openness and neuroticism. Playing low risk games only, reporting a high amount of spending on gambling and the personality trait extraversion were inversely related to positive beliefs about RG measures. The total explained variance was however only 7.1%. Positive beliefs about RG measures can relate to needs for external based countermeasures to minimize or reduce problems. Negative views may reflect a wish to play without obstacles, take risks or to trust in self-control.

Keywords Responsible gambling · Gambling problems · Pre-commitment · Prevention · Harm reduction · Gambling

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Introduction

Responsible gambling (RG) measures can be defined as "policies and practices designed to reduce and prevent potential negative consequences associated with gambling" (Blaszczynski et al. 2004, p. 308). Common measures/tools used to enforce RG are for instance exclusion from gambling (e.g. self- or operator initiated), and limitations (e.g. on volume, time, frequency and loss) (Haefeli et al. 2011).

RG measures are regarded as an integrated part of the responsibility of the gambler and the gambling industry, aiming at costumers' protection and harm reduction. This should be distinguished from treatment which typically comprises a set of techniques administered by health professionals with the aim of improving the state of patients who already are suffering from serious gambling-related harm (Blaszczynski et al. 2004).

Over the last years, responsible gambling (RG) measures have been introduced to the gambling markets as means to prevent gambling problems or to reduce negative consequences of existing problems. For some measures, features are developed where gamblers can regulate their own gambling behaviour. Many RG measures require personal identification and are thus primarily available for online gambling and seldom applicable to land-based gambling. Some measures and restrictions can be set by authorities or gambling operators (e.g. mandatory spending limits), whereas others can be applied by the gamblers themselves (e.g. self-exclusion) (Auer et al. 2015). The specifics of implemented measures can vary across jurisdictions and between operators. In the present paper these measures are abbreviated "RG measures" when used generally and for measures set by authorities or operators. In addition, "RG features" or "RG tools" are used when referring to specific features offered for individual gamblers for their own use.

Participators in games are referred to as *gamblers*. This is line in with a proposed definition of gambling as "staking money or something of material value on an event having an uncertain outcome in the hope of winning additional money and/or material goods" (Williams et al. 2017, p. 11).

This article addresses how gamblers believe RG measures will help them to control their gambling consumption. Knowledge about how gamblers believe that RG measures will help them is important for both gambling operators and regulators. How RG tools provided by gambling operators are used by gamblers are likely to depend on how the gamblers assess such tools. The knowledge about how RG measures are viewed can contribute to the success of the RG measures offered by operators and the use by the gamblers. Knowledge of the gamblers' views can also help operators or regulators to differentiate between whether or not a RG tool (e.g. budget tool) should be mandatory or voluntary.

RG measures set by authorities or operators can normally not be altered by the gamblers. One example can be maximum stakes in certain games. Another example is maximal loss limits, which requires a form for registered play where the gamblers' identity is known to the game operator and where player data is continuously registered and stored. Because of the technical requirements associated with player account data, registered play is mostly relevant for online gambling. However, in a few countries, such as Norway, registered play is also mandatory when gambling on land-based machines (Auer et al. 2015), i.e. video lottery terminals (VLTs). There are also other land based-games in Norway which are offered as registered play only. This applies for number games, pools, sports betting and horse racing sold from retailers.

RG measures may include information provided to the gamblers about their gambling behaviour, such as time used and money spent. Information is sometimes conveyed in the

form of pop-up messages during a gambling session. Pop-up information may disrupt the gambling and make the gamblers conscious of their gambling behaviour (Gainsbury 2012). Information can also be provided in terms of statements from the gambling operator about losses over certain periods of time. Furthermore, based on analysis of individual player data, gambling companies can provide gamblers with personalized information about how their gambling behaviour develops over time (Auer et al. 2015). Measures where gamblers receive personalized type of feedback require registered play. Gamblers can also obtain information from self-assessment tests where, based on their responses, they receive information about their current problem status (Wood and Griffiths 2015). Based on the feedback, they can choose to take actions, e.g. set restrictions upon themselves.

"Pre-commitment" (Williams et al. 2012) is a type of RG measure that enable the gamblers to adjust how much time or money they can spend gambling, e.g. per day or month. Gamblers can also exclude themselves from gambling temporary or more permanent. Exclusions can be set to prevent problem gamblers from gambling. Exclusions can also help at-risk or problem gamblers to control their gambling behaviour by staying away from certain games for a specified period of time (Hayer and Meyer 2011). Such pre-commitment features will stop the gamblers from gambling when a time- or monetary limit is reached, whereas gamblers who have excluded themselves will be prohibited from gambling altogether. To be effective, these tools require registered play where the operators' systems automatically will act if a limit is reached or an excluded gambler attempts to log in.

Although RG measures have been implemented by several gambling operators worldwide there are still limited empirical research on their effectiveness (Auer et al. 2019; Ladouceur et al. 2017). However, a review of 29 articles (1999–2015) indicated some evidence of the effectiveness of the RG measures, but also pointed to several limitations of the research (Ladouceur et al. 2017).

In a more recent study, a sample of gamblers with Norsk Tipping (the Norwegian state-owned gambling monopolist), were surveyed after the operator had introduced a mandatory loss limit across the whole game portfolio. The results showed that 78% were positive to the maximum loss limit, and among those who reached this limit 73% did not continue gambling with other companies. Another 10% had not gambled at all since they were stopped (Auer et al. 2019).

Recently, several studies addressing how gamblers evaluate RG measures have been published. Some studies are restricted to users of slot machines, mostly with a focus on RG measures which do not require registered play (Blaszczynski et al. 2014; Ladouceur et al. 2012; Ladouceur and Sévigny 2009; Monaghan and Blaszczynski 2010). One example is an Australian study where 299 slot machine gamblers evaluated the effectiveness of five proposed RG features: A responsible gambling message, a bank meter where the gambler could keep the winnings until the game was terminated, an alarm clock enabling gamblers to set time with reminder, demo mode play where the player could play without money, and finally a donation feature where residual amounts could be donated to good causes rather than for the gambler to use these to continue playing. The results showed that 26% of the gamblers believed that these RG features would prevent recreational gamblers from develop a gambling problem (Blaszczynski et al. 2014).

A more extensive study examined personal RG strategies in a sample of 1797 lottery gamblers recruited from UK National Lottery's customers. In addition to lottery draw games, they also played scratch cards, sports betting, bingo, slot machines, casino card games and casino table games. Games were played both land-based and online. The gamblers were asked which of five personal strategies they used to prevent not spending more

money than intended: Set spending limits, set time limits, work out what they could afford to lose, only take certain amount of cash out to play and leave ATM cards at home. Results showed that the vast majority used one or more strategies. To set a spending limit before beginning to play was most common and 90% reported they did so mostly or always. Online gamblers were asked if it was easier to keep their spending limits when they played online. For lottery draw games, slightly over 50% of the respondents said it was easier to keep the limits when lottery tickets were bought online compared to when it was bought from a shop. For all other games, the most frequent response was that it was neither easier nor harder to keep the spending limit when games were played online. Irrespective of type of game, more respondents stated that it was generally easier than harder to stick to the spending limit (Wood and Griffiths 2015).

A large study of 10,838 online gamblers recruited from 96 countries and over 100 online websites, investigated the gamblers' perception of the value of RG features. The data was collected in 2006 from gamblers who played online casino and/or online poker. Most of the respondents lived in North America and United Kingdom. The gamblers were asked if they found the following five RG features useful: Self-set spending limits, self-set time limits, self-exclusion, regular financial statements and self-assessment test. The majority of the gamblers, and particularly those who chased losses, were under the age of 35 or females, endorsed the utility of the RG features. Those who played internet casino games were also more likely to perceive three of the RG features as more useful compared to the online poker players (Gainsbury et al. 2013).

In a recent study, 2352 respondents registered as gamblers with the largest Norwegian operator were surveyed after the operator implemented a mandatory global loss limit (NOK 20,000/~2500 US $ per month) across the game portfolio (comprising lottery, casino, sports betting and VLTs) where all games, except paper-based scratch cards, are played registered. When playing online games of medium or high risk (measured through the assessment tool Gamgard) or land based VLTs, the gamblers must set personal loss limits (Auer et al. 2019). The sample was divided into three groups according to PlayScan, a player tracking system that classify the gamblers as green (low risk), yellow (medium risk) or red (high risk for problem gambling). Among the studied topics was attitude, beliefs about personal relevance and whether the limit would help the respondent to obtain an overview and control over their losses. In all, 79% of the sample had a positive attitude towards the global loss limit and the green gamblers were most often positive (82% of green, 75% of yellow and 67% of red gamblers). A total of 25% agreed (in part or entirely) that the limit was relevant to them, and the yellow and red gamblers agreed most often (18% of green, 41% of yellow and 41% of red gamblers). When asked whether the loss limit would help them to maintain overview and control the losses, 40% of the green, 56% of the yellow and 56% or the red gamblers agreed (in part or entirely). The gamblers were also asked about reasons for setting personal loss limits. One of the response alternatives was to achieve better control over their losses. A total of 29% of respondents who agreed to this reason for setting personal loss limits were red gamblers whilst red gamblers only comprised 19% of the total sample (Auer et al. 2019).

Elster describes in his book "Ulysses Unbond" (2000) general reasons and devices for pre-commitment where, among others, passions and addictions are listed. The knowledge that humans under influence of passions may deviate from their intentions or decisions creates incentives for pre-commitment. Elster describes low willpower as one of the ways where passion can lead to behaviour different from originally intended. He regards addiction as an example of lack of willpower where pre-commitment can be more reliable than will itself. One way to overcome passions or addictions is thus to eliminate options or

"throw away the key" (Elster 2000). From this perspective it becomes important to distinguish between "personal/internal" RG strategies and "external" RG measures. The internal strategies will be in the gamblers mind whilst external RG measures will be set in RG features by the gambler before gambling take place as a fortification of the original intention to e.g. not play for more than a certain amount of money or they are set by the gambling operator.

Many factors have been identified as risk factors for problem gambling or gambling addiction. If such factors relate to beliefs about RG measures is however mostly unknown. Several studies have showed that males and younger gamblers more often have gambling problems than females and older persons (Johansson et al. 2009). Ethnicity can also be a risk factor. A study in the United States showed that the prevalence rate of disordered gambling were lowest for white Americans (Alegria et al. 2009). Some of the games or how they are distributed also seem to act as risk factors for problematic gambling behaviour. Among game characteristics assumed to increase the risk of problems are event frequency (time from the stake is set to the outcome is clear and a new stake can be set) and availability (distance from home) (Gamgard 2018; Meyer et al. 2011). Gambling expenses are also related to gambling problems. Problem gamblers spend more money and time gambling than other gamblers (Williams and Wood 2004; Yani-de-Soriano et al. 2012). Furthermore, gambling advertisements seem to have greater impact on risk and problem gamblers than those without such problems and has been reported to cause relapse (Binde 2008; Hanss et al. 2015). The five-factor model for personality (Boyle et al. 2008) is a reliable and valid personality trait model and has previously been used in the analysis of gambling problems. The five factors being neuroticism, extraversion, openness, agreeableness and conscientiousness. Higher scores on neuroticism and lower scores on conscientiousness have been associated with problem gambling (Bagby et al. 2007; Brunborg et al. 2016; MacLaren et al. 2011). Neuroticism includes being nervous and prone to worry whereas conscientiousness reflects being hardworking and disciplined (Boyle et al. 2008).

To the best of our knowledge, no previous study on gamblers beliefs about RG measures has been based on random and representative samples drawn from national population registries. The present study analysed the beliefs about RG measures among gamblers in a complete gambling market, both land-based and online. This study investigates the beliefs about RG measures and if beliefs could be explained by risk factors such as demography, gambling behaviour, personality traits and self-reported impact from gambling advertisement.

The following research questions were addressed:

1. What are the beliefs among gamblers about how RG measures can help to control their gambling?
2. Which variables contribute to explain how the beliefs vary between gamblers?

Methods

Participants and Procedure

Sample

This study is based on quantitative survey data collected in two Norwegian prevalence studies conducted at the University of Bergen. Data were collected in 2013 and 2015. In total, 38,000 persons (24,000 in 2013 and 14,000 in 2015, gross sample) aged 16 through 74 years were randomly selected form the National Population Registry of Norway and invited to participate in postal surveys. For both years in total 15,566 valid answers (net sample) were received. After elimination of persons with wrong addresses, illness, deaths, etc., an overall response rate of 42.6% was achieved (43.6% in 2013 and 40.8% in 2015). Up to two reminders were sent both times. Data were weighted for age, gender and place of residence (county) in Norway. The questionnaires in 2015 and 2013 had completely identical questions for our purpose, and data from both years were thus collapsed into one dataset, in total containing responses from 9129 gamblers.

In the weighted net sample, a total of 58.7% had gambled the last 12 months, 54.8% for women ($n = 7624$) and 62.4% for men ($n = 7934$). Within specific age groups the gambling rate was lowest for those 16–25 years: 39.2% ($n = 2780$). The other age groups had higher rates: 26–35 years 60.2% ($n = 2809$), 36–45 years 61.4% ($n = 3035$), 46–55 years 63.7% ($n = 2836$), 56–65 years 66.7% ($n = 2451$) and 66–74 years 63.4% ($n = 1646$). Among the gamblers 54.2% were male and the average age was 45.3 year, $SD = 15.22$ ($n = 9129$).

Procedure

The gamblers were categorised according to whether they had played low risk games only or if they had played games with higher risk (i.e. medium or high). Gamgard (an assessment tool) was used to categorize the games in terms of risk for gambling problems. Gamgard scores the risk in games as *very low*, *low, medium, high* or *very high*. With this tool, ten game characteristics are considered with regards to a particular games' potential contribution to developing gambling problems, e.g. event frequency (time taken to buy a game, get the result, and buy the game again) and accessibility (how easily available a game is) (Gamgard 2018). The assessment tool also takes into consideration four RG features that reduce the risk, e.g. monetary budget tools (Gamres 2018). These four RG features were not considered in the present assessment. In all 26.5% had played low risk games only (*very low* or *low*), whereas 73.5% had played at least one medium- or high-risk game (*medium, high* or *very high*). All the games are listed below. Number games and pools were categorized as low risk games and all other games as higher risk (medium or high). As different games within one game category can have different risks, and since the questionnaire did not differentiate between all games within one category (e.g. for horse racing), the game type was consequently categorized as medium/high risk. The gamblers were categorised in terms of whether they had played random games only, or at least one skill game. Skill games imply games where the gamblers can improve their winner chances based on skills (i.e. pools, betting, horse racing, online poker and private games such as poker among friends). The non-skill or random games comprised number games, bingo and bingo machines, scratch cards, online casino, video lottery terminals (VLTs), and

games on ships (slots and table games). Online casino and games on ships were catego-rised as random because the questions about these games did not differentiate between skill and non-skill games. A total of 60.4% of the gamblers had participated in random games only, whereas 39.6% had participated in at least one game involving skill. The gamblers were also divided into two groups based on money spent. This was done to identify the gamblers who were most involved in at least one game type. Those who had spent more than 5000 NOK (~700 US $) on at least one game type within the last 12 months were categorised as high spenders (comprising 11.0% of the gamblers), whereas those who had not gambled for more than 5000 NOK on at least one a game type (89.0% of the gam-blers) were categorised as low spenders. The gamblers were asked how often they gambled on four electronic devices: Stationary computer, lap-top, tablet or mobile phone. For each device, the response alternatives ranged from never to daily. In the present study an online gambler was defined as someone who had gambled at least once using at least one of the four devices. In total 27.0% were categorised as online gamblers, whereas 73.0% were cat-egorised as land-based only gamblers.

Instruments

Gambling Participation

The respondents were asked if they during the last 12 months had participated in games (yes or no). The question contained a definition of games described as games with mon-etary stakes where results from an event or a draw could lead to monetary prizes.

Demographics

The respondents were asked about *gender* (female, male), *age* (exact age) and *place of birth* (eight alternatives: Norway, the other Nordic countries, the rest of Europe or one of the other five continents).

Games Played

The respondents were asked if they had *participated in the following games:* Number games, pools, betting, horse racing, bingo, bingo machines, scratch cards, private games (e.g. poker games with friends), online casino, video lottery terminals (VLTs), games on ships (slots and table games) and online poker. In addition to the Norwegian regulated games, the respondents were also asked if they had played games offered on foreign web-sites. The respondents confirmed participation by answering for each game the alternative for expenditure which was nearest to their gambling yearly spending (none/not gambled, *NOK 1–1000*, *NOK 1001–5000*, *NOK 5001–10,000*, *NOK–10,001–25,000* and *more than NOK 25,000*). The questions were only answered by those who initially had confirmed that they had gambled the last 12 months. Those who had gambled were also asked if they had gambled online. From the collected data four dichotomous variables were constructed: Low risk games only versus medium/high risk game participation, random games only ver-sus skill game participation, game spending (low vs. high) and online gambling (no vs. yes).

Canadian Problem Gambling Index (CPGI)

The CPGI was used to assess the extent of *gambling problems* in the Norwegian population. The CPGI consists of nine items related to gambling the last 12 months. Five of these items measure problematic gambling behaviour and four measures consequences (e.g. "Have you needed to gamble with larger amounts of money to get the same feeling of excitement?" and "Has gambling caused you any health problems, including stress or anxiety?"). The nine items are scored with a scale ranging from 0 (*never*) through 3 (*always*). The composite score thus varies from 0 to 27. Based on the composite score the respondents are divided into four groups: Non-problem gamblers (total score 0), low risk gamblers (composite score 1 and 2), moderate risk gamblers (composite score 3 through 7) and problem gamblers (composite score 8 or higher) (Ferris and Wynne 2001). In the present paper the gamblers were divided into two groups: No problem/low risk gamblers and moderate risk/problem gambler. The prevalence of moderate risk or problem gamblers was 5.2% (n = 9066). Cronbach's alpha for the CPGI in the present study was .89. Cronbach's alpha values above .70 are considered acceptable and values above .80 are preferable (Pallant 2016).

Mini-International Personality Item Pool (MINI-IPIP)

The MINI-IPIP consists of 20 items that measure the main dimensions of the five-factor model for personality (neuroticism, extraversion, openness, agreeableness and conscientiousness). Each dimension is assessed by four items (Donnellan et al. 2006). The respondents provide their answer on a scale ranging from 1 (*very inaccurate*) through 5 (*very accurate*). Neuroticism (N) is a factor where being *sad* and *scared* will be at the high end of the factor in contrast to *calm* and *stable* at the other end. The factor Extraversion (E) reflects being *warm*, *outgoing and cheerful* in contrast to being *reserved*, *solitary and somber*. Openness to experience (O) describes being *imaginative, curious and having exploratory* tendencies in contrast to being *rigid, practical and traditional*. Agreeableness (A) reflects being *generous, honest and modest* in contrast to *selfishness, aggression and arrogance*. Conscientiousness (C) reflects being *hardworking, purposeful and disciplined* in contrast to be *laid back, unambitious and weak willed* (Boyle et al. 2008). Cronbach's alpha among the gamblers for the sub-scales neuroticism, extraversion, openness, agreeableness and conscientiousness were .67, .79, .66, .71 and .67, respectively. Lower alpha values are common to find when there are few items in a scale (Pallant 2016).

Impacts from Gambling Advertising

In all, nine items on how gambling advertising had an impact on the gamblers were included. Five of the items were adopted from the Effects of Gambling Advertising Questionnaire (EGAQ) (Derevensky et al. 2007). The items are scored from 1 (*strongly disagree*) through 4 (*strongly agree*). In addition, four new items were added. Two of these were related to knowledge about gambling opportunities ("Gambling advertisement has increased my knowledge of gambling options" *and* "Gambling advertisement has increased my knowledge of gambling providers"). One item measured change in behaviour due to gambling advertisement ("I play with higher risk (use more money) because of gambling advertisements") and one related to attitude ("I think more

positively about gambling because of gambling advertisements") (Hanss et al. 2015). A total composite score was created by adding the score on each item divided by the number of items. These questions were only answered by those who had gambled during the last 12 months. Cronbach's alpha for the nine items was .76.

Responsible Gambling Measures

Ten items measured the gamblers' beliefs about RG measures and how they think that these mechanisms would help them regulating their own gambling consumption. Many of the items were based on existing RG features, e.g. prize money direct to gamblers bank account and not directly available for further gambling (Mentzoni 2013). The questions were also based on an article that explored the perception of the value of potential RG measures (Gainsbury et al. 2013). All the ten items covered mechanisms that are presently available in parts of the Norwegian gambling market. In the questionnaire, the gamblers were asked to which degree they agreed that these characteristics help or would help them regulating their own gambling consumption. There were five response alternatives for each item: *Totally disagree, disagree, neither agree nor disagree, agree and totally agree*. See Table 2. A total score ranging from 1 (*totally disagree*) through 5 (*totally agree*) was calculated by adding the scores from each item, divided by ten. A high score indicates a more positive belief about RG measures than a lower score. The mean total composite score was 2.98 ($SD = 1.12$) and Cronbach's alpha was .96. The items were subjected to an exploratory factor analysis (principle component) showing support for a one-factor solution based on Kaisers' criterion. The factor explained 74.7% of the variance and the factor loadings varied between .75 (item a) and .90 (item f, g and h). It was only respondents who had gambled the last 12 months who were asked how they believed the RG measures would help them to control their gambling. Hence the data is restricted to gamblers only. Table 2 lists the items and presents the results across the two surveys (2013 and 2015).

Table 1 shows the distribution or mean for the different study variables.

Statistics

The dependent variable comprised the gamblers beliefs about RG measures based on the composite score of the ten RG items. The results from all questions are presented in terms of frequencies or mean and standard deviation. We investigated the correlation between all study variables. A rough guideline to interpretation of correlations suggests small correlations when $r = .10$ to .29, medium correlations when $r = .30$ to .49 and large correlations from $r = .50$ to 1.00 (Cohen 1988). Finally, the data was analysed with a multiple regression analysis. Missing data was deleted pairwise. Independent variables comprised gender (women = 0, men = 1), age, place of birth (outside Norway = 0, Norway = 1), game risk (middle/high = 0, low = 1), game type (at least one skill game = 0, random only = 1), game spending (low = 0, high = 1), online gambling (no = 0, yes = 1), being a moderate risk/problem gambler (no = 0, yes = 1), extraversion, agreeableness, conscientiousness, neuroticism, openness to experience, and self-reported impact from gambling advertisement. Preliminary analyses were conducted to ensure no violation of the assumption of normality, linearity, multicollinearity and homoscedasticity.

Table 1 Descriptive statistics: percentages or mean and standard deviation (SD) of the studied variables among the gamblers ($N = 8588$–9129)

Variable	Percentage	Mean (SD)
Gender		
Women	45.8	
Men	54.2	
Age (16–74)		45.26 (15.22)
Place of birth		
Europe, North America, Oceania	5.5	
Africa, Asia, South or Central America	2.4	
Norway	92.1	
Participated in games with low or higher risk		
Played higher risk games (medium and high)	73.5	
Played low risk games only	26.5	
Participated in random or skill games		
Played both random and skill games or skill only	39.6	
Played random games only	60.4	
Game spending		
Low	89.0	
High	11.0	
Gambled online		
No	73.0	
Yes	27.0	
PGSI		
Non-problem gambling (PGSI 0)	81.8	
Low-risk gambling (PGSI 1–2)	13.0	
Moderate risk gambling (3–7)	4.0	
Problem gambling (8+)	1.2	
Moderate risk of problem gamblers (PGSI 3+)	5.2	
Personality traits		
Extraversion		13.99 (3.46)
Agreeableness		16.57 (2.72)
Conscientiousness		15.84 (2.97)
Neuroticism		10.00 (3.33)
Openness		13.78 (3.21)
Self-reported effect from gambling marketing		1.91 (0.56)
Total score—beliefs about RG measures		2.98 (1.12)

Results

Table 2 shows that gamblers often did not have a strong opinion about the regulation mechanisms and between 35 and 42% neither disagreed or agreed to that the mechanisms would help them regulate their gambling consumption. When comparing the frequencies for all 10 items, those with an opinion (who agreed or totally agreed compared to those who disagreed or totally disagreed), more often agreed than disagreed. However, when comparing

Table 2 Descriptive statistics: percentages, mean and standard deviation (SD) for the ten items used to construct the total score for the Beliefs about RG measures ($N = 8791$–8859)

The following factors help me or would help me to regulate my gambling consumption	Totally disagree % (1)	Disagree % (2)	Neither disagree nor agree % (3)	Agree % (4)	Totally agree % (5)	Mean	SD
a. Prizes go direct to my bank account	21.1	5.6	38.8	18.7	15.8	3.03	1.311
b. Upper limit for stakes	22.5	6.8	36.3	18.8	15.6	2.98	1.334
c. Continuous feedback from the game on my losses	20.7	5.7	35.4	21.8	16.6	3.08	1.326
d. Continuous feedback from the game on my time spent gambling	21.9	7.3	42.1	16.6	12.0	2.89	1.259
e. Upper limit for prize size	25.4	9.5	38.6	14.9	11.5	2.78	1.294
f. The game has predefined limit for losses	20.5	5.7	36.8	20.5	16.4	3.07	1.318
g. Prior to gambling, I can set a loss limit in the game	19.2	5.2	35.2	22.9	17.6	3.14	1.316
h. Prior to gambling, I can set a time limit in the game	20.9	7.0	41.6	17.6	12.9	2.95	1.263
i. I can tell the game to ban me for a certain period	21.7	6.6	39.8	17.4	14.6	2.97	1.299
j. Through the game I can take a self-test and get feedback if I have gambling problems	21.5	6.2	42.0	16.2	14.1	2.95	1.283

The characteristics a, b, e and f are measures were the gamblers have no options to change the parameters, and the measures are set by authorities or gambling operators. c, d and j are measures where the gamblers get feedback about their gambling behaviour. g, h and i are tools where the gamblers, prior to gambling, can set limits for how much time or money they want to use for gambling or exclude themselves from gambling. Tools where the gamblers can set limitations for money and time consumption can be mandatory or voluntary to use

those who only responded *totally agree* with those who responded *totally disagree* there were more gamblers who totally disagreed. A one-way repeated ANOVA was used to identify the most valued regulation mechanisms. Overall, there was a significant difference in terms of how the mechanisms were valued ($F_{9,65194} = 183.1$, $p < .001$; Greenhouse–Geisser correction). Bonferroni-corrected post hoc tests revealed that the most valued mechanisms were item g, "Prior to gambling, I can set a loss limit in the game", which was valued significantly higher than all other items ($p < .001$). Item c, "Continuous feedback from the game regarding my losses", was valued significantly higher than all other items than f and g ($p < .001–.005$). Item f, "The game has predefined limit for losses", was valued significantly higher than all other items except item a, c, and g ($p < .001$). In the further analyses, only the total average score summarized across all ten mechanisms was analysed. In the following the gamblers view will be expressed as positive or as a positive evaluation when gamblers agreed that the RG measures will help them. When gamblers disagreed, the view will be expressed as negative.

Table 3 shows that the view on responsible gambling measure had significant zero-order correlations with many of the independent variables, however no significant correlation with *Game type (random only or at least one skill game)*, *Gambled online/land-based* and *Extraversion* were found. The strongest zero-order correlations with beliefs about RG measures was found for *Age* ($r = -.19$) and for *Self-reported impact from gambling advertisement* ($r = .15$).

The results from the regression analysis are shown in Table 4. The predictors explained a total of 7.1% of the variation of the dependent variable "Beliefs about RG measures".

Table 4 shows that 11 of the independent variables were significant predictors of beliefs about RG measures whereas three independent variables did not reach significance (*Place of birth*, *Gambled online/land-based* and *Conscientiousness*). The total regression model was significant ($R^2 = .071$, $F_{14,8261} = 44.901$, $p < .001$).

When looking at the standardized beta coefficients, the strongest predictors were *age* and *self-reported impact from gambling advertisement*. Older gamblers evaluated the mechanisms less positive and gamblers who self-reported strong impact from gambling advertisement assessed the mechanisms more positive. *Gender* had also an impact, where female gamblers had more positive beliefs than males.

High spenders had a more negative belief than low spenders. *Moderate risk or problem gamblers* had more positive beliefs than non-problem/low-risk gamblers. Those playing *low risk games only* had a more negative belief than those playing at least one moderate/high risk game. *Playing random games only* was positively associated with beliefs about RG measures.

Four of the five personality factors turned out significant. Three (agreeableness, openness to experience and neuroticism) were positively associated with beliefs about RG measures whilst one (extraversion) was negatively associated with the belief.

Discussion

The results show that gamblers in general often do not have a strong opinion about RG measures. However, among those with an opinion, more were positive rather than negative. The multiple regression analysis showed that 11 of the 14 independent variables had a significant impact on how RG measures were valued among gamblers. In total, the predictors

Table 3 Pearson product-moment correlation coefficients, point-biserial correlation coefficients and Phi coefficients between all variables ($N = 8276$–9129)

	Beliefs about RG measures	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Gender (women 0, men 1)	−.070***													
2 Age	−.187***	−.065***												
3 Place of birth (outside Norway 0, Norway 1)	−.036**	−.004	.072***											
4 Game risk (at least one medium/high 0, low only 1)	−.087***	−.057***	.298***	.018										
5 Game type (at least one skill game 0, random only 1)	.007	−.298***	.124***	.007	.369***									
6 Game spending (low 0, high 1)	−.099***	.133***	.107***	.013	−.031**	−.136***								
7 Gambled online (no 0, yes 1)	.018	.245***	−.237***	−.022*	−.123***	−.308***	.136***							

Table 3 (continued)

	Beliefs about RG measures	1	2	3	4	5	6	7	8	9	10	11	12	13
8	Moderate risk/ problem gambler (no 0, yes 1)	.043***	.099***	−.121***	−.126***	−.115***	−.170***	.212***	.196***						
9	Extraversion	.012	−.048***	−.089***	.004	−.035**	−.030**	−.040***	−.044***	−.030**					
10	Agreeableness	.076***	−.312***	−.028**	.067***	−.001	.105***	−.066***	−.105***	−.107***	.343***				
11	Conscientiousness	−.046***	−.176***	.169***	.023*	.122***	.101***	−.028**	−.087***	−.145***	.132***	.202***			
12	Nevrotisisme	.075***	−.157***	−.078***	−.107***	−.047***	.022*	−.010	−.024*	.100***	−.151***	−.046***	−.192***		
13	Openness to experience	.079***	.090***	−.218***	−.063***	−.096***	−.034**	−.048***	.060***	.020	.259***	.200***	−.047***	−.013	
14	Self-reported impact from gambling advertisement (scale 1–4, disagree to agree)	.152***	.134***	−.248***	−.042***	−.178***	−.210***	.057***	.219***	.200***	.020	−.069***	−.148***	.111***	.067***

$*p < .05$; $**p < .01$; $***p < .001$

Table 4 Regression analysis summary for demographic, gambling and personality variables predicting beliefs about RG measures ($N = 8275$)

Predictors	Unstandardized coefficient		Standardized coefficient		
	Beta	Std. Error	Beta	t	p
Gender (women 0, men 1)	−.134	.028	−.059	−4.844	.000
Age	−.010	.001	−.132	−10.928	.000
Place of birth (outside Norway 0, Norway 1)	−.064	.045	−.015	−1.430	.153
Game risk (at least one medium/high 0, low only 1)	−.088	.030	−.035	−2.901	.004
Game type (at least one skill game 0, random only 1)	.066	.028	.029	2.312	.021
Game spending (low 0, high 1)	−.288	.040	−.081	−7.224	.000
Gambled online (no 0, yes 1)	−.035	.030	−.014	−1.177	.239
Moderate risk/problem gambler (no 0, yes 1)	.135	.058	.027	2.345	.019
Extraversion	−.011	.004	−.033	−2.823	.005
Agreeableness	.027	.005	.065	5.307	.000
Conscientiousness	−.006	.004	−.015	−1.278	.201
Neuroticism	.010	.004	.030	2.632	.008
Openness to experience	.012	.004	.035	3.083	.002
Self-reported impact from gambling advertisement	.251	.023	.126	10.977	.000

Dependent variable: beliefs about RG measures. $R^2 = .071$, $F_{14,8261} = 44.901$, $p < .001$

explained 7.1% of the variation. This means that the predictors altogether did not have a very strong explanatory power.

The previous mentioned study by Gainsbury et al. (2013) also showed that the majority of the gamblers were positive to RG measures and valued them as useful.

In the present study the beliefs about RG measures correlated significantly, but not strongly, with most of the independent variables. The strongest correlations were found for age and self-reported impact from gambling advertisement.

The results from the regression analysis showed that men were more negative than women in their view on RG measures. Support for our findings that women are more positive to RG measures is found in a study comprising 657 students in California. That study showed that men take more risks and that women judge the negative consequences of gambling as more likely to occur and as more severe (Harris et al. 2006). This finding is also in line with a meta-analysis showing that men in general take more risks than women (Byrnes et al. 1999). More positivity from female gamblers towards RG measures was also seen in the large study of online casino and poker players (Gainsbury et al. 2013).

Our data showed that older gamblers were less positive to RG measures than younger ones. This is also in line with the results from Gainsbury et al. (2013). Young age is a significant risk factor for problem gambling (Johansson et al. 2009), which can be explained with more impulsivity and risk-taking among the younger. From a social neuroscience perspective, risk taking declines from adolescence towards adulthood because of changes in the brain's impulse control system (Steinberg 2008). This notion is in line with a study of 528 participants in the age of 18 to 93 years, that mainly showed tendencies of reduced risk-taking with age (Rolison et al. 2014). It is suggested that RG measures are more often viewed as helpful by younger gamblers because the measures are perceived as external help to control impulsivity.

Our analysis shows that gamblers who played low risk games only were less positive to RG measure than those who played games with medium or high risk. A plausible explanation for the low risk gamblers' belief is that they play games where the risk for problematic behaviour is low, and therefore seldom or never experience a personal need for RG measures.

Gamblers who played random games only were more likely to be positive towards RG measures than those who played at least one skill game. This is partly in line with Gainsbury et al. (2013) where those who played internet casino games, compared to the online poker players, were more likely to perceive three of the RG features as more useful. Playing games with elements of skill can be related to "illusion of control", implying that the gamblers feel they can trust their skills in gambling situations when also chance is involved, which can lead to inappropriate confidence (Johansson et al. 2009). If gamblers of skill games more often feel they have control over their gambling and the outcome, they might also regard external RG measures as less useful and needed.

The gamblers with high spending were more likely to be negative to the RG measures compared to those with lower spending. It can be argued that the former group may perceive RG measures as tools that will inhibit their gambling too much, and therefore they might oppose RG measures. On the other hand, moderate risk or problem gamblers tended to be positive to the RG measures. In the latter group there will be gamblers who experience problematic gambling behaviour and consequences and they may as such regard RG measures as helpful to reduce their problems and negative consequences of gambling. This is in line with Auer et al. (2019) showing that the gamblers who according to a player tracking system have medium or high risk for problem gambling, more often are self-aware and know that loss limits are useful to them.

Four of the five personality traits showed a significant association with how RG measures were valued. Gamblers with higher score on extraversion were less positive to RG measures. In general, extraverted people like to be stimulated and their behaviour are often driven by external rewards which is in line with MRI studies supporting differences between introverts and extroverts when it comes to the sensitivity of the brain's reward systems (Hirsh 2010). Accordingly, extraverted are assumed to regard RG measures as an obstacle for stimulation and rewards, which may explain why this trait were inversely associated with beliefs about RG measures.

The personality trait agreeableness was a positive predictor of how RG measures were assessed. In a Norwegian study with 218 students, agreeableness was significantly and negatively associated with four behavioural addictions (internet addiction, exercise addiction, mobile phone addiction, and compulsive buying), thus high scores on agreeableness was considered to be a protective factor against developing addictions (Andreassen et al. 2013). Positive views on RG measures is in line with this and RG measures will assumingly act as a protection against interpersonal problems and conflicts created from gambling. This notion would be in agreement with the nature of those with high scores on agreeableness.

Neuroticism showed a positive association with beliefs about RG measures. Those scoring high on this trait may be inclined to look out for threats. A study of students showed that neuroticism was significantly and positively associated with four behavioural addictions (internet addiction, exercise addiction, compulsive buying and study addiction). A suggested explanation was that neuroticism is a risk factor for excessive behaviour and related to being prepared, or to be on top of things (Andreassen et al. 2013). From this perspective a positive belief about RG measures can be expected among those with high scores on neuroticism as these measures contribute to, or satisfy, a need for predictability and external regulation to reduce risks and uncertainties.

The last personality trait with a significant impact on the assessment of RG measures was openness to experience. Higher scores predicted more positive views. Openness to experience describes being curious and exploratory in contrast to being traditional (Boyle et al. 2008). Since many of the assessed RG measures are relatively new in gambling markets (Auer et al. 2015), it can be argued that gamblers with higher score on this personality trait consequently will have a positive outlook on new methods for regulating gambling.

Some traits (e.g. agreeableness) were positively associated with attitudes towards RG measures whilst at the same time negatively associated with having problems with gambling (risk or problem gambling). Still, at risk and problem gamblers were more positive towards RG measures than gamblers without problems. This may seem as inconsistent findings but reflect that these factors (traits and gambling problem status) independently were associated with attitudes towards RG measures. As all data in the present study were based on self-report, it would be of interest to investigate these relationships using objective data on the use of RG measures.

The final variable that significantly affected how RG measures were viewed was self-reported impact from gambling advertisement. The more the gamblers said they were affected by such marketing, the more positive they were to the RG measures. Studies have showed that marketing makes it harder for problem gamblers to stick to their previous decisions to reduce or stop gambling (Binde 2008; Hing et al. 2014). The gamblers who self-report high impact from gambling adverts know they are sensitive to external stimuli, and therefore it can be proposed that they accordingly recognize a need for external control.

Many of the factors in the present study found to be positively associated with beliefs about RG measures. This can be explained as a reflection of a need for external regulation of own behaviour and inclinations. Accordingly, younger gamblers may endorse external regulation in order to control impulsivity and gamblers with high scores on agreeableness or neuroticism may embrace external measures helping them by providing protection and predictability. Hence, for some the pre-commitment will be more reliable than the will itself (Elster 2000).

In a study describing the development of the *Positive Play Scale* (PPS) (Wood et al. 2017) a four-item subscale for pre-commitment was identified ("I only gambled with MONEY that I could afford to lose", "I considered the amount of MONEY I was willing to lose BEFORE I gambled" and two corresponding items for time consumption). The higher score, the more pre-commitment. In a sample of 412 gamblers, the score on the subscale correlated significantly and negatively with the PGSI score and the personality trait neuroticism. A positive correlation was found towards the trait conscientiousness. This present study found significant, but weaker, correlations between the beliefs in RG measures and the same variables, albeit in the opposite direction. In this regard it should be noted that the PPS subscale was based on items which measured behaviour and pre-commitment in terms of personal strategies. The present study however measured gamblers beliefs about external RG measures only. Thus, the contradictory findings emphasize the importance of distinguishing between internal/personal RG strategies and external RG measures.

To pre-commit or to use a strategy, internally or externally, for self-control is not only a measure used related to gambling. In the book "Ulysses Unbound", Elster describes several reasons for pre-commitment. One reason is passion described in a broad sense as emotions or cravings, which may cause people to deviate from plans laid in cooler moments. Elster outlines four ways where passions can cause the behaviour to differ from initial intentions. "They may do so by distorting cognition (inducing false believes about consequences), by clouding cognition (blotting out awareness of consequences), by inducing weakness of will (options with worse perceived consequence over options with better consequences), or by

inducing myopia (changing the decision weights attached to the consequences)" (Elster 2000, p. 8).

The aforementioned ways passion can lead one astray are relevant for gambling. A passionate gambler's emotions can affect how the outcome of gambling is perceived e.g. the chances of winning. Passion can be so strong that negative consequences are out of sight, and a game might be played for longer than first intended. When playing a game, the gambler can perceive the consequences of the gambling differently to when not gambling. Eliminating options and creating delays are among the devices Elster presents as countermeasures. Passions can be so strong that they must be neutralized by avoiding the situations where emotions are triggered. Delays can also be useful, both for passions and for cravings related to addictive substances. To be effective the delays must be set in advance and before a passion induced situation emerges (Elster 2000).

Avoidance and delays as strategies for pre-commitment are in line with RG measures featured in the present study. Through RG features, gamblers can avoid gambling situations by excluding themselves from games temporarily or more permanent. Gamblers can also set personal limits for spendings so that they cannot continue playing once a limit is reached, and this RG feature can be facilitated in such a way that if a gambler want to exceed a spending limit there is a delay before the new and wider limit is activated (Auer et al. 2015). A feature where winnings are transferred directly into a bank account, instead of being instant available for gambling, also creates a delay. For individuals with addiction problems, Elster describes one strategy as "throwing away the key" when a person makes the addictive substance physically unavailable. Another strategy is to "give away the key" to others and let others help to protect the addict from him or herself (Elster 2000). When it comes to RG measures, a decision to restrict oneself from gambling lies with the gambler. The gambler should then expect the gambling operator to refuse the gambler's eventual wishes to eliminate constrains that are set.

There are both obstacles and objections to pre-commitment strategies. Two of these are described in the present study. Pre-commitment might not be available, and when activated it can represent loss of flexibility (Elster 2000). In gambling markets RG measures are more easily available for online gambling and less available in the land-based marked (Auer et al. 2015).

Our analysis did identify groups of gamblers (e.g. males, extroverts, high spenders with no reported gambling problems) who are more likely to assess RG measures negatively. *Pre-commitment, even when desirable, may not be feasible or effective; when feasible and effective, it might not be desirable* (Elster 2000, p. 77).

The notion and practice of harm reduction have for long been noted within the field of drug addiction. One example is the introduction of educational and needles exchange programs in the 1980s which proved effective in terms of reducing HIV risk behaviours associated with injecting drugs (Cross et al. 1998).

Practical Implications

Based on the current findings, we suggest it is important to distinguish between internal RG strategies and external RG measures, the latter being studied here. Different groups of gamblers can have different views on RG measures. Different factors may be related to the beliefs about internal strategies and external RG measures. Further research should accordingly study the factors that can explain both the views and the use of internal RG strategies as well as external RG measures. Some gamblers will believe that it is sufficient

to have an internal intention to gamble responsible, whilst others might find it useful, and maybe necessary, to have their intentions for responsible gambling fortified with external RG measures. Knowledge about the different views and factors related to these views are important for operators and regulators. Such knowledge can be used in decisions on how to market and present RG measures for the gamblers in such ways that relevant groups of gamblers find the RG features useful.

Strengths and Limitations

To the best of our knowledge the present study is the first where gamblers' beliefs about RG measures are analysed based on a sample representing the general population of gamblers in a country (as they were drawn from a national population registry). The present study is also the first where the views about external RG measures are analysed against personality traits. Even if the sample size is relatively large, it was considered too small to warrant separate analysis of smaller groups of gamblers (e.g. among gamblers playing specific games).

The assessment of RG measures can also be influenced by cultural differences. In a study of focus groups in Canada, Germany, Sweden, UK and USA it was reported that players preferred RG features as a personal choice and not as a mandatory requirement (Parke et al. 2012). The present study has shown that among Norwegian gamblers with an opinion about the RG measures, most agree that mandatory measures will help them to control their gambling consumption. In this regard Auer et al. (2019) mention cultural differences as one of the possible reasons behind the large percentage of Norwegian gamblers with a positive attitude towards mandatory loss limits. Another possible explanation is that the Norwegian gamblers generally are familiar with external RG measures (Auer et al. 2019). This implies that the current findings cannot be generalized to other cultures without reservations, thus cross-cultural studies on this topic are warranted.

The present paper comprises gambler's subjective views on the use of RG measures. Although this arguably is of interest to gambling operators and regulators, it should still be acknowledged that no records of actual/objective use of RG measures were included in the study. Thus, future studies should investigate peoples view on actual RG measures, including behavioural tracking data showing real-life use of such measures and factors (e.g. demographic and personality) associated with their usage.

The fact that the independent variables together only explained 7.1% of the variance in beliefs about RG measures may reflect that the dependent variable (beliefs about RG measures) was purely subjective and that the respondents reflected a heterogeneous population of gamblers. Still we believe that the small proportion of explained variance may also reflect that some relevant independent variables were not included in the survey, alas not included in the model.

Only respondents who had gambled during the 12 months were asked about their views on RG measures. This may be regarded a limitation. Thus, future studies should also assess the general view of non-gamblers on RG measures.

Conclusions

Gamblers with an opinion about RG measures, agree more often than they disagree that the RG measures will help them to control their gambling consumption. The three RG features that most gamblers assessed positively were budget tools where they can set loss

limits prior to gambling, continuous feedback on their losses and predefined limits for losses. Eleven variables were identified as significant predictors for how RG measures were assessed. Younger gamblers and those who say they are affected by gambling adverts were more positive to RG measures than their counterparts. Female gamblers were more positive than men. When it comes to gambling behaviour, the gamblers who played games with low risk only, those who played skill games and those who gambled with the highest spending were more often negative. Gamblers with a problematic gambling behaviour were more positive. Four of the personality traits in the five-factor model for personality were significant predictors. Three of them (agreeableness, neuroticism and openness to experience) were positively associated with positive view on RG measures. Extraversion showed the reversed pattern. We suggest the positivity to the RG measures for some are related to the need for predictability, security, stability and external help to keep self-control and reduce problems. The negative view on the RG measures seems to be related to a wish to play without obstacles, take risks or a strong believe in self-control without any need of external RG regulation.

Compliance with Ethical Standards

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