

Gambling patterns and associated risk and protective factors among Finnish young people

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Abstract

Background and aims: In recent years online gambling has become a potential risk for young people. The purpose of this study was to analyse patterns of gambling activities and their association with behavioural risk factors and protective factors. **Data and Method:** A demographically balanced sample of Finnish respondents aged 15–25 years ($N = 1200$) filled out an online survey in March–April 2017. Principal component analysis was used to reduce the variables on gambling activities to smaller sets of components, and regression analysis was used to analyse whether behavioural risk factors and protective factors were associated with the gambling patterns found. **Results:** Two main components were found: online- and skill-based competent gambling and chance-based entertainment gambling. Competent gambling had statistically significant associations with a variety of behavioural problems and risks, including psychological distress, lower social support, lower delay of gratification, hazardous drinking, regular drug use, compulsive Internet use, and problem gambling. Entertainment gambling was associated with lower delay

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gratification, hazardous drinking, and problem gambling. Entertainment gambling had a negative association with compulsive Internet use and a positive association with social support. **Conclusions:** Online-based competent gambling is a potentially hazardous form of gambling. New forms of online gambling are potential risks for younger generations. Health professionals working with young people should be aware of the role of online gambling and associated activities.

Keywords

gambling, nationwide survey, online gambling, risk factors, young people

Gambling is a common activity among young people, and various studies conducted around the world have reported a high prevalence of gambling among young people (Blinn-Pike, Worthy, & Jonkman, 2010; Calado, Alexandre, & Griffiths, 2017; Dowling et al., 2017). Recently, new opportunities for gambling have emerged via the rapid rise of information and communication technologies. These include, for example, online gambling and casino sites that have become popular particularly among active Internet users (Gainsbury et al., 2015; King, Delfabbro, & Griffiths, 2010; Raisamo, Halme, Murto, & Lintonen, 2013). Popular forms of online gambling include poker (Biolcati, Passini, & Griffiths, 2015; Griffiths, Parke, Wood, & Rigbye, 2010), online casino games (Kristiansen, Jensen, & Trabjerg, 2014; Volberg, Gupta, Griffiths, Ólason, & Delfabbro, 2010), and other types of online games such as bingo (Griffiths, 2011).

It is important to understand how new forms of online gambling are situated within the wide spectrum of gambling activities identified in previous studies. Studies on adult populations have noted, for example, that gambling activities can be separated into high- and low-action types and skill-based and chance-based types (Bonnaire et al., 2017; Goudriaan, Slutske, Krull, & Sher, 2009; Myrseth, Brunborg, & Eidem, 2010; Stevens & Young, 2010). A study of college students found that activities were clustered around readily available and informal forms (e.g., card gambling, games of skill for money, sports betting) and formal forms

(e.g., casino games and slot machines) of gambling (Goudriaan et al., 2009). Individuals who see themselves as professional or semi-professional gamblers prefer skill-based games (e.g., poker) and online gambling venues more than those who identify as amateur gamblers, who tend to prefer chance-based forms of offline gambling (e.g., lottery tickets; Hing, Russell, Blaszczynski, & Gainsbury, 2015). It is also possible that the increasing availability of new forms of online gambling has changed gambling behaviour.

The Internet provides fast access to activities that would otherwise be difficult to access for young people who have not reached the legal age for gambling (Cotte & Latour, 2008). Longitudinal findings have shown that gambling activities vary a lot during adolescence, but they become more stable with the transition to adulthood. Gambling also increases during the transition from adolescence to emerging adulthood (Delfabbro, King, & Griffiths, 2014), which is a period when risk-taking is manifested and young people tend to take risks not only in terms of economic decisions but also in terms of substance use (Adams & Moore, 2007; Arnett, 2005; Nelson, Lust, Story, & Ehlinger, 2008; Oksanen, Aaltonen, Majamaa, & Rantala, 2017; Worthy, Jonkman, & Blinn-Pike, 2010). It is also possible that many of these risky activities co-occur at a young age. Studies have shown co-occurrence of gambling with drinking and with illicit drug use (Blinn-Pike et al., 2010; Walther, Morgenstern, & Hanewinkel, 2012) and with problematic Internet use

(Yau et al., 2014). Positive gambling attitudes during adolescence and emerging adulthood are determinants of gambling involvement and its associated risks (Dixon et al., 2016; Salonen et al., 2014; Sarti & Triventi, 2017; Shin & Montalto, 2015).

Overall, gambling is a more common activity among men than women (Delfabbro et al., 2014; Dowling et al., 2017; Volberg et al., 2010). Men are also more likely to report multi-gambling activities (Elton-Marshall, Leatherdale, & Turner, 2016; Salonen, Hellman, Latvala, & Castrén, 2018). However, there exist significant gender differences in gambling preferences and motivational reasons for gambling. Women often use gambling as a form of escapism, whereas men are generally more action oriented (Delfabbro, 2000; Holdsworth, Hing, & Breen, 2012). Men are also more likely to participate in skill-based gambling (Stevens & Young, 2010; Welte, Barnes, Wieczorek, Tidwell, & Parker, 2002), while women tend to prefer chance-based games (Holdsworth et al., 2012). Compared to women, men also tend to start gambling at a younger age and they display heavier levels of gambling (Potenza, Maciejewski, & Mazure, 2006). Furthermore, men generally hold more optimistic views about the risks involved in gambling and are more likely to overestimate their own gambling skills (Kristiansen et al., 2014).

Psychosocial factors associated with gambling behaviour are generally divided into risk factors and protective factors (Dowling et al., 2017). Among personal characteristics, impulsivity in particular has been shown to be a risk factor for problem gambling (Dowling et al., 2017; Dussault, Brendgen, Vitaro, Wanner, & Tremblay, 2011; Slutske, Caspi, Moffitt, & Poulton, 2005). People with gambling problems and other addictions are also well known for having a tendency to search for immediate gratification, and they prefer smaller immediate rewards over larger delayed rewards (Ainslie, 2001; Bickel & Marsch, 2001; Orford, 2011). These tendencies are typically examined with delay of gratification, which assesses the ability

of individuals to resist a readily available stimulus, or with a form of delay discounting that measures individuals' cognitive processes in devaluating a hypothetical large reward over an immediate small one (Reynolds & Schiffbauer, 2005). This type of delay discounting is tested by asking people whether they would prefer a smaller sum of money right away or a larger sum after some time (Green & Myerson, 2004; Mittal & Griskevicius, 2014). Present-biased preference in choices is more common among young people who prioritise fast rewards (Steinberg et al., 2009). Experimental research has further shown that problem gamblers have a tendency towards delay discounting (Dixon, Marley, & Jacobs, 2003; Green & Myerson, 2004; Petry & Casarella, 1999). Similar findings have been found among compulsive Internet users (Li et al., 2016).

Psychological distress is another risk factor in problem gambling (Bonnaire et al., 2017; Goudriaan et al., 2009). Longitudinal studies have shown that problem gambling at the age of 21 years was associated with negative emotionality at the age of 18 (Slutske et al., 2005). Studies have also shown that adolescents with problematic gambling behaviour report lower psychological wellbeing (Blinn-Pike et al., 2010). Psychological distress has been particularly associated with online gambling (Petry & Weinstock, 2007). However, a recent study suggested that mixed gambling, in particular (both online and offline) was associated with problem gambling and consumption of alcohol during gambling, and that offline gamblers had the highest levels of psychological distress (Blaszczynski, Russell, Gainsbury, & Hing, 2016).

Social support and social bonding are among the protective factors in relation to gambling problems (Dowling et al., 2017). A lack of perceived social support from close ones is also an acknowledged risk factor for developing and maintaining gambling-related problems (Hardoon, Gupta, & Derevensky, 2004; Petry & Weiss, 2009), and at-risk or problem gamblers often report lower perceived social support (Canale et al., 2017). Perceived social

support is important in the online context; previous studies have shown that strong offline bonds buffer the harms encountered on the Internet (Minkkinen et al., 2016; Turja et al., 2017). This is also an important factor in studies involving young people and gambling activities. Young excessive gamblers in particular tend to replace their pre-existing strong social ties with gambling-related social relationships (Blinn-Pike et al., 2010), which may at least partly explain the lower levels of perceived social support.

In this study, we analysed patterns of gambling activities and their association with behavioural risk factors and protective factors. We first aimed to empirically assess the patterns of gambling activities among young people. Secondly, we analysed how these patterns associate with behavioural and social psychological factors including excessive behaviour, delay of gratification, psychological distress, and perceived social support.

Method

Participants

A total of 1200 participants aged 15 to 25 years (50% female, age: $M = 21.29$, $SD = 2.85$) were recruited from a pool of volunteer respondents provided by Survey Sampling International (SSI) in March–April 2017. Survey Sampling International provides data solutions for research purposes globally, and SSI panels have been awarded with honours for consistency in independent audits (Lorch, Cavallaro, & van Ossenbruggen, 2014) and have been found to be close to official Statistics of Finland survey statistics (Lehdonvirta, Oksanen, Räsänen, & Blank, 2018; Näsi et al., 2014). The main strategy of SSI is to combine respondents from different sources and maintain consistency of the multisourced sample by prescreening respondents with reference to standard sociodemographic and other factors (for details, see Lorch et al., 2014).

The sample was stratified to mirror the Finnish population in terms of age, gender, and

residential area structure (see Sirola, Kaakinen, & Oksanen, 2018; Statistics Finland, 2017). The imposed quotas allowed only for small differences from official population statistics. A comparison of the sample with the population showed only minor deviations based on standard sociodemographic factors (Appendix A). However, the sample had a higher percentage of students (64.33%, self-reported information) compared to the population (46.81%). The statistics Finland figures for occupational status are, however, for the year 2016. Our data set also contains a lower number of respondents below the age of 18. Despite this, our sample is within the expected margins of error in terms of gender and population area, and therefore weighting the data was not considered necessary.

Our sample includes more potential at-risk gamblers than the Finnish Gambling Survey 2015 collected by the National Institute for Health and Welfare (Sirola et al., 2018; cf. Salonen & Raisamo, 2015). This is potentially due to a number of reasons. The Gambling Survey 2015 was conducted as a telephone survey, and such surveys are known to show a lower prevalence of problem gambling compared to other methods of survey administration (Lee, Back, Williams, & Ahn, 2015; Williams, Volberg, & Stevens, 2012). Young respondents are also severely underrepresented in the Finnish national gambling surveys. These surveys generally suffer from nonresponse which compromises their representativeness (Salonen, Raisamo, & Alho, 2013). This is not surprising, as over one quarter of Finnish emerging adults have had their payments and loans enforced by the state (Oksanen, Aaltonen, & Rantala, 2015). These debt problems make it very hard to contact them via phone, as many of them use only prepaid mobile phone cards. This study purposely selected the sampling method that would allow us to reach even those burdened by debt problems, and we were potentially able to attract respondents who would not normally participate in surveys.

The study was approved by the Academic Ethics Committee of Tampere region in

December 2016. All participants agreed to voluntarily participate in a *YouGamble* online survey, and they were informed about the aims and purpose of the study. The survey was designed in Finnish and conducted using LimeSurvey software on the server of the University of Tampere. It was optimised for both computers and mobile devices. The median response time for the survey was 15.50 minutes.

Measures

Gambling behaviour was measured using questions about gambling activity types that are included at the beginning of the SOGS-R scale (South Oaks Gambling Screen). The original SOGS included 10 questions about the frequency of different gambling activities (questions 1a–1j; see Lesieur & Blume, 1987, p. 1187). These questions have been slightly modified for the Finnish versions of the SOGS-R (Castrén et al., 2013; Edgren et al., 2016; Salonen & Raisamo, 2015). We further slightly modified and simplified some of the gambling activity questions of an 11-question set to make them easier for young people to understand and to better typify the common Finnish features on gambling among young people. The respondents were asked which of the following they had practiced or played during the previous 12 months: (a) slot machines (e.g., poker machines, fruit machines), (b) online casino games (e.g., fruit games), (c) online poker, (d) casino games (e.g., poker, roulette, black jack), (e) sports betting, (f) lotteries, (g) bingo, (h) scratch cards, (i) private betting (e.g., card games), (j) games of skill for money (e.g., billiard or bowling), and (k) investments (e.g., exchange of stocks or options). All of these gambling activities had answer options concerning the intensity of gambling ranging from 0 (*never*) to 6 (*daily*), and they were used for the principal component analysis.

Covariates of this study included sets of attitudinal and behavioural variables (see also Appendix B). Our sociodemographic controls included age and gender. The first set of

variables measured social psychological factors potentially related to gambling activities.

Delay of gratification was measured with a test of three questions concerning whether the participants would rather receive either a certain sum of money immediately or a larger sum after 33 days. The received lower sum varied from €28 to €40, and the larger sum ranged from €62 to €87. This measure is grounded in behavioural economics literature on delay discounting (Bickel & Marsch, 2001; Green & Myerson, 2004). A similar test for delay of gratification has also been used in social psychological studies on impulsivity and economic behaviour (Mittal & Griskevicius, 2014). Our scale had good internal consistency ($\alpha = .83$) and ranged from 0 to 3 ($M = 2.49$, $SD = 0.97$). A higher figure indicates higher delay of gratification.

Psychological distress was measured with the widely used 12-item General Health Questionnaire (GHQ-12; Goldberg et al., 1997; Pevalin, 2000). The scale had good internal consistency ($\alpha = .88$), with 12 questions ranging from better to worse. Bimodal scoring (0–0 –1 –1) was applied (Pevalin, 2000), and the scale ranged from 0 to 12, with higher scores indicating higher levels of psychological distress ($M = 3.71$, $SD = 3.52$).

Perceived social support was measured with a single item: “Do you feel that you get support from your close ones when needed?” The options *never*, *sometimes*, and *often* were categorised into a dummy variable indicating strong social support (0 = *never* or *sometimes*, 47.05%, 1 = *often*, 52.95%).

Compulsive Internet use was measured with the 14-item Compulsive Internet Use Scale (Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009). The scale had excellent internal consistency ($\alpha = .93$, range 0–56, $M = 18.79$, $SD = 11.13$). In addition, we used AUDIT-C (Alcohol Use Disorders Identification Test) to measure for hazardous drinking. The measure includes three items with good internal consistency ($\alpha = .82$, range 0–13, $M = 4.14$, $SD = 2.98$).

Regular drug use was measured with a set of five questions concerning the use of different

drugs with intoxicative purposes. A dummy variable was created to separate those who had not used drugs regularly from those who had used or were still using cannabis, stimulants, hallucinogens, opioids, or other pharmaceuticals. The share of those who had either previously used or were currently using drugs was 5.42%, half of whom were cannabis users.

The Attitudes Towards Gambling Scale (ATGS-8) comprises eight questions in total and is a widely used measure in studies concerning gambling (Canale, Vieno, Pastore, Ghisi, & Griffiths, 2016; Salonen et al., 2014). The alpha reliability of the ATGS was acceptable ($\alpha = .75$), and the scale ranged from 8 to 39 ($M = 23.41$, $SD = 5.09$). Higher scores indicated positive gambling attitudes.

Problem gambling was measured with SOGS-R, which has been widely used in Finnish studies on gambling and with the 15–25 age range (Castrén et al., 2013; Edgren et al., 2016; Salonen & Raisamo, 2015). The scale had excellent reliability ($\alpha = .89$) and ranged from 0 to 20 ($M = 1.59$, $SD = 2.56$). Higher scores indicated problem gambling.

Statistical analysis

We used principal component analysis (PCA) to reduce the variables on gambling activities to a smaller set of components. Each of the 11 items showed a correlation of at least 0.3 with at least one item, which indicated that the data were suitable for principal component analysis (see Appendix A). The requirements for PCA were met. The Kaiser–Meyer–Olkin measure of sampling adequacy was .93, which indicates high factorability. Also, we found that Bartlett’s test of sphericity was significant, $\chi^2(55) = 7933.35$, $p < .001$, and the off-diagonal elements of the anti-image correlation matrix were low (only 17% were $> .09$). All the variables loaded at least .3 or above on components, and we were able to keep them all. Selection of final components was based on eigenvalue (> 1.0). In the results section, we report component loadings, eigenvalues, and explained variances.

We applied ordinary least squares regression (OLS) to the component scores to better understand what kind of risk and protective factors were associated with the gambling components found. All the required assumptions of OLS were noted and tested. There were no issues with multicollinearity (mean variance inflation factor of full model 1.11). We ran the models using Huber–White standard errors (i.e., robust standard errors) because of heteroscedasticity of the residuals. In the following section, we present the effects of the independent variables with the coefficients (unstandardised B and standardised β) and robust standard errors (SE). We also report the statistical significance (p) for every variable and variances accounted for each model (R^2).

Results

Our results show that the prevalence of gambling during the past 12 months was 85.3% among the respondents. Slot machines, lotteries, and scratch cards were the most common gambling activities. For example, 68.3% had played scratch cards and 59.2% had played slot machines at least once. The least common gambling activities were online poker (21.2% at least once), casino games (25.3%), private betting (25.5%), games of skill for money (25.5%), and financial investments (25.5%). All the gambling activities had statistically significant correlations with each other ($p < .001$; Spearman’s ρ ranging from .29 to .70).

The parameters of the principal component models showed that gambling activities loaded on two components with eigenvalues higher than 1. The first component had an eigenvalue of 6.20 and explained 56% of the variance. The figures for the second component were 1.11 and 10%, respectively. We restricted the analysis to these two components, which together explained 66% of the variance. The rest of the components explained between 2% and 7% of the variance each, had low eigenvalues, and were hence excluded from further analysis.

The two selected components are shown in Table 1. The first component had the highest

Table 1. Component loadings and explained variance of gambling activities.

	Component 1	Component 2	Explained
	Competent gambling	Entertainment gambling	
Slot machines (e.g., poker machines, fruit machines)	0.26	0.53	0.72
Online casino games	0.31	0.27	0.67
Online poker	0.34	-0.13	0.71
Casino games (poker, roulette, black jack)	0.33	-0.15	0.72
Sports betting	0.29	0.32	0.65
Lotteries	0.26	0.38	0.59
Bingo	0.31	-0.19	0.65
Scratch cards	0.29	0.09	0.52
Private betting (e.g., card games)	0.33	-0.29	0.74
Games of skill for money (e.g., billiards, bowling)	0.31	-0.32	0.72
Investments (e.g., exchange of stocks or options)	0.27	-0.36	0.59
Eigenvalue	6.16	1.11	
Variance explained	.56	.10	

Note. Boldface indicates loadings > .3 or < -.3.

loadings on activities related to online gambling (e.g., online poker, online casinos, bingo), card games in general, and betting on games involving personal skill, such as billiards. This component was hence named *competent gambling*. The second component had the highest loading for slot machine playing. It also had a loading of more than 0.3 for lotteries and sports betting. This component had negative loadings for both games of skill for money and financial investments. We named this component *entertainment gambling*.

We used component scores for the linear OLS regression analyses. Competent gambling had a mean value of 0 (*SD* = 2.48, ranging from -1.99 to 11.39), and entertainment gambling had a mean value of 0 (*SD* = 1.05, ranging from -6.09 to 6.10). Higher scores indicated a higher level of either competent or entertainment gambling. The regression models were run separately for both components. Both Tables 2 and 3 include first gender, age, and psychological measures as the first step (Model 1). The second step includes hazardous drinking, regular drug use, and compulsive Internet use (Model 2). Finally, the last step includes attitudes towards gambling and problem gambling.

Table 2 shows the results for competent gambling. The first model showed that competent gambling was associated with male gender ($\beta = .31, p < .001$), older age ($\beta = .07, p = .003$), lower delay of gratification ($\beta = -.17, p < .001$), psychological distress ($\beta = .08, p = .006$), and weak social support ($\beta = -.09, p = .002$). Psychological distress was not significant in Model 2, which also included excessive behaviour. In Model 2, hazardous drinking ($\beta = .13, p < .001$), regular drug use ($\beta = .09, p = .013$), and compulsive Internet use ($\beta = .18, p < .001$) were associated with competent gambling. Model 3 showed that all previous associations remained significant, except for regular drug use ($\beta = .06, p = .083$). We found that competent gambling was associated with both positive attitudes toward gambling ($\beta = .14, p < .001$) and problem gambling ($\beta = .40, p < .001$).

Table 3 shows the results for entertainment gambling. In Model 1, entertainment gambling was associated only with age ($\beta = .18, p < .001$), lower delay of gratification ($\beta = -.08, p = .023$), and strong social support ($\beta = .09, p = .017$). Model 2 showed that only hazardous drinking was associated with

Table 2. Regression models explaining competent gambling (unstandardised and standardised regression coefficients, standard errors, and statistical significances).

	Model 1				Model 2				Model 3			
	B	SE	β	p	B	SE	β	p	B	SE	β	p
Male	1.56	0.14	.31	<.001	1.51	0.14	.30	<.001	0.93	0.13	.19	<.001
Age	0.06	0.02	.07	.003	0.06	0.02	.06	.014	0.05	0.02	.06	.015
Delay of gratification	-0.43	0.08	-.17	<.001	-0.41	0.08	-.16	<.001	-0.27	0.08	-.11	.001
Psychological distress	0.06	0.02	.08	.006	0.01	0.02	.01	.734	-0.02	0.02	-.03	.196
Strong social support	-0.45	0.14	-.09	.002	-0.45	0.14	-.09	.002	-0.30	0.13	-.06	.018
Hazardous drinking					0.11	0.03	.13	<.001	0.05	0.02	.06	.040
Regular drug use					0.99	0.40	.09	.013	0.61	0.35	.06	.083
Compulsive Internet use					0.04	0.01	.18	<.001	0.03	0.01	.14	<.001
Attitudes towards gambling									0.07	0.01	.14	<.001
Problem gambling									0.38	0.04	.40	<.001
R ² adj.	.15				.20				.35			

entertainment gambling ($\beta = .17$; $p < .001$), but not regular drug use. Compulsive Internet use was negatively associated with entertainment gambling ($\beta = -.08$, $p = .023$). Finally, in Model 3 we can see that delay of gratification is not significant. The model also shows that unlike competent gambling, entertainment gambling was associated with strong social support and lower compulsive Internet use scores. It was also associated with positive gambling attitudes ($\beta = .12$, $p < .001$) and problem gambling ($\beta = .15$, $p = .009$).

Discussion

The aim of this study was to analyse patterns of gambling activities and their association with behavioural risk factors among Finnish young people. Based on principal component analysis, we reduced different gambling activities to two principal components: competent gambling and entertainment gambling. Competent gambling was based on online gambling and personal

skill. Entertainment gambling was more chance based and grounded on activities such as slot-machine playing and lotteries. Our findings are hence in line with some of the previous studies drawing the line between skill-based and chance-based gambling (Goudriaan et al., 2009; Myrseth et al., 2010; Stevens & Young, 2010). Earlier research has also suggested that both online gambling and skill-based games tend to be preferred by persons identifying as professional or semi-professional gamblers (Hing et al., 2015).

Our regression analyses show some similarities and some major differences between these patterns. Both patterns were associated with older age, weaker delay of gratification, hazardous drinking, positive gambling attitudes, and problem gambling. The results concerning age are understandable, as gaining a legal age of 18 increases opportunities for gambling. These results are also in line with the findings of previous studies that have shown an increase in gambling from adolescence to emerging

Table 3. Regression models explaining entertainment gambling (unstandardised and standardised regression coefficients, standard errors, and statistical significances).

	Model 1				Model 2				Model 3			
	B	SE	β	p	B	SE	β	p	B	SE	β	p
Male	0.05	0.06	.02	.468	0.01	0.06	.00	.912	-0.11	0.06	-.05	.090
Age	0.07	0.01	.18	< .001	0.05	0.01	.12	< .001	0.04	0.01	.12	< .001
Delay of gratification	-0.09	0.04	-.08	.023	-0.07	0.04	-.07	.062	-0.05	0.04	-.04	.226
Psychological distress	0.00	0.01	-.01	.667	-0.01	0.01	-.03	.435	-0.01	0.01	-.04	.188
Strong social support	0.20	0.06	.09	.001	0.15	0.06	.07	.018	0.17	0.06	.08	.007
Hazardous drinking					0.06	0.01	.17	< .001	0.05	0.01	.14	< .001
Regular drug use					0.07	0.19	.01	.723	0.00	0.19	.00	.994
Compulsive Internet use					-0.01	0.00	-.08	.023	-0.01	0.00	-.09	.013
Attitudes towards gambling									0.03	0.01	.12	< .001
Problem gambling									0.06	0.02	.15	.009
R ² adj.	.04				.08				.11			

adulthood (Delfabbro et al., 2014). Gambling was also associated with lower delay of gratification. More specifically, competent gamblers particularly sought a smaller immediate reward and were reluctant to wait for a reward that would be more than two times greater in 33 days. This finding is in line with previous research on delay discounting that has shown that addicts and gamblers are especially likely to make poor judgements and select smaller immediate rewards over larger delayed rewards (Ainslie, 2001; Bickel & Marsch, 2001; Dixon et al., 2003; Orford, 2011). Furthermore, our results indicate that online and skill-based gambling are especially popular among those who tend to make impulsive decisions.

In addition, our finding on the association of hazardous drinking with both forms of gambling was expected in light of previous findings (Blinn-Pike et al., 2010; Dowling et al., 2017; Walther et al., 2012). Positive gambling attitudes have been associated with gambling frequency and a high number of game types

played in previous studies (Salonen et al., 2014). Gambling itself is naturally a risk for developing more severe forms of gambling problems or a gambling disorder, as they are currently categorised in the newest edition of the *Diagnostic and statistical manual of mental disorders (DSM-5)*; Petry, Blanco, Stinchfield, & Volberg, 2013).

Besides these similarities, there were also major differences between competent gambling and entertainment gambling. Competent gambling was marked by male gender. This finding is perhaps not surprising, as males have been found to prioritise action-oriented and skill-based gambling (Bonnaire et al., 2017; Delfabbro, 2000; Holdsworth et al., 2012; Stevens & Young, 2010; Welte et al., 2002). One of the most interesting findings was that competent gambling was associated with lower perceived social support and entertainment gambling with higher perceived social support. As social support is considered a protective factor against the development of gambling problems (Dowling

et al., 2017), competent gambling could be considered a riskier gambling pattern. This finding was further underlined by the discovery that psychological distress and regular drug use were associated with competent gambling. It is possible that young people who are strongly engaging in competent gambling patterns tend to replace their close social relationships with gambling-related social ties (Blinn-Pike et al., 2010) and thus receive less social support from their close ones. It appears that this is not the case with entertainment gamblers, who demonstrated a higher association with perceived social support.

We also noted that competent gambling was associated with higher compulsive Internet use scores and entertainment gambling with lower compulsive Internet use scores. Competent gambling is clearly a more online-based form of gambling. Hence, this result is not surprising. However, we wish to note that in today's world the distinction between the strictly online world and strictly offline world has become blurred because people are using smartphones and have continuous Internet access. The constant development of the Internet is also making the regulation of content and online activities a very difficult task, although efforts have been made to do so (Keipi, Näsi, Oksanen, & Räsänen, 2017). We believe that online opportunities may also encourage some young people to look for offline-based gambling opportunities. Finally, we wish to note that these findings contribute to an urgent need to understand the role of the online sphere in terms of gambling behaviour. Many young people actively participate in gambling-related online communities, which may promote positive gambling attitudes and encourage excessive gambling, possibly leading to further financial, social, and psychological difficulties (Sirola et al., 2018). These findings imply that policy makers in Finland have to understand the potential risks related to online gambling.

Limitations and strengths

Our study is limited by its cross-sectional design, as longitudinal studies have shown that

youth gambling activities are not stable during the transition to adulthood (Delfabbro et al., 2014; Sagoe et al., 2017). Another limitation is the use of participant self-report. A further potential limitation is that our study relied on online panels, which have some acknowledged weaknesses that have also been discussed in the literature (Callegaro et al., 2014; Spijkerman, Knibbe, Knoop, Van De Mheen, & Van Den Eijnden, 2009). However, due to the rising costs of surveys and decreasing response rates, new methods of data collection have been acknowledged. They have been also recognised as more reliable compared to traditional survey studies, especially when studying sensitive topics (Lee et al., 2015). Online panels have been increasingly used in studies published in leading sociological journals (e.g., Martin, 2009; O'Brien, 2017), and they have been widely accepted in studies investigating health and addiction from social scientific perspectives (e.g., Nieboer, Koolman, & Stolk, 2010; Scheuermann et al., 2015; Wolf, Welte, Barnes, Tidwell, & Spicer, 2015). In psychology, online panels have been welcomed as many of the studies have been limited to college populations (Buhrmester, Kwang, & Gosling, 2011). Considering these aspects, our study has noteworthy strengths. The study employed a sizeable sample of young Finnish participants. Compared to other national samples, this data set represented a higher response rate from younger respondents, who are typically underrepresented in national surveys. Second, the study was able to demonstrate existing gambling patterns and the risk factors associated with them.

Conclusions

Online-based competent gambling is a potentially hazardous form of gambling, whereas entertainment gambling is less so. New forms of online gambling are potential risks for members of the younger generations, who have an increasing online presence. Policy makers and health professionals working with young people should be aware of the role of online gambling

and associated activities, and implement new policies accordingly.

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Appendix A. YouGamble Finland 2017 sample compared to the population of 15 to 25-year-olds in Finland.

	Sample	Population
Male	50.00%	51.35%
Age		
15–17 years	17.92%	25.30%
18–21 years	40.83%	35.28%
22–25 years	41.25%	39.42%
Residential area		
Helsinki area	26.59%	27.25%
Other towns or cities	61.29%	60.37%
Countryside	12.12%	12.38%
Student	64.33%	46.81%
At least second-degree education	56.25%	46.90%
Born abroad	4.08%	6.84%

Note. Population statistics are based on official population census (see Statistics Finland, 2017). The newest figures for occupational status (student) and education are from 2016.

Appendix B. Means and standard deviations for the outcome variable and scaled predictive variables. Percentages for categorical variables.

Variables	Range	α	<i>M</i>	<i>SD</i>
<i>Outcome variables</i>				
Slot machines	0–6	–	1.15	1.35
Online casino games	0–6	–	0.67	1.19
Online poker	0–6	–	0.47	1.07
Casino games	0–6	–	0.48	1.02
Sports betting	0–6	–	0.87	1.32
Lotteries	0–6	–	1.15	1.35
Bingo	0–6	–	0.48	1.00
Scratch cards	0–6	–	1.02	1.02
Private betting	0–6	–	0.48	1.03
Games of skill for money	0–6	–	0.49	1.03
Investments	0–6	–	0.56	1.16
Competent gambling (component)	–1.99–11.39	–	0	2.48
Entertainment gambling (component)	–6.09–6.10	–	0	1.05
<i>Predictive variables</i>				
Age	15–25 years	–	21.29	2.85
Delay of gratification	0–3	.83	2.49	0.97
Psychological distress (GHQ-12)	0–12	.88	3.71	3.52
Hazardous drinking (AUDIT-C)	0–13	.82	4.14	2.98
Compulsive Internet use (CIUS)	0–56	.93	18.79	11.13
Attitudes towards gambling (ATGS-8)	8–39	.75	23.41	5.09
Problem gambling (SOGS-R)	0–20	.89	1.59	2.56
			%	
Male	0/1	–	50.00	–
Strong social support	0/1	–	52.95	–
Regular drug use	0/1	–	5.42	–

GHQ-12 = 12-item General Health Questionnaire; AUDIT-C = Alcohol Use Disorders Identification Test; CIUS = Compulsive Internet Use Scale; ATGS-8 = Attitudes Towards Gambling Scale; SOGS-R = South Oaks Gambling Screen.