



Gambling, Online Gambling and Poker Participation among Icelandic University Students

Anne Franziska Müller

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Sálfræðideild
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Leiðbeinandi: Daniel Þór Ólason

Sálfræðideild

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Abstract

The intent of the study was to evaluate gambling among Icelandic university students. The relationship between problem gambling and gambling participation, in particular online gambling and poker participation were examined. Furthermore coping strategies and attitudes towards gambling among Icelandic university students were researched for a connection with gambling behavior. The survey was conducted in March 2010 with 1230 Icelandic university students participating. The average age of the sample was 29.63 years ($SD = 8,48$) with 33% ($n = 408$) male students and 67% ($n = 816$) female students. The sample was administered the PGSI, CISS and ATGS. Most of the students (78,4%) have gambled at least once in the past year. Prevalence of problem gambling among the sample was 0,4% and moderate risk gambling 1,9%. Students who gambled both online and on terrestrial venues were more likely to be problem gamblers than participants who played exclusively on land-based venues. Poker players were more likely to have gambling problems than students who did not play poker. Coping strategies had no connection to gambling behavior. Attitudes towards gambling were significantly more positive among problematic gamblers and students who played more frequently than among other students.

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1 Introduction

Gambling can be defined as staking something of value on the outcome of an event when the probability of losing or winning is less than reliable (Korn & Shaffer, 1999). Gamblers are thus individuals who expose their money to variable, uncertain and negative expected outcomes (Mishra, Lalumière, & Williams, 2010). The reasons why individuals gamble are as various as games are diverse. Escapism, excitement, status gain, to make money or to be sociable are examples of such reasons (Reith, 2007). The inability to withstand recurrent impulses to gamble, despite disadvantageous consequences to the gambler and others, is called pathological gambling (PG) (MacLaren, Best, Dixon, & Harrigan, 2011). The distinction between gamblers and pathological gamblers is based on consequences of gambling. Pathological gambling is often defined by whether harm is experienced by the gambler or others, rather than by the gambler's gambling frequency itself (Engwall, Hunter, & Steinberg, 2004). Individuals have often lost or jeopardized a significant relationship, job or career opportunity, lied to family members and experienced unsuccessful efforts to control, cut back or stop their gambling behaviour. They are also preoccupied with gambling and have to gamble with increasing amounts of money in order to achieve the desired excitement (Fauman, 2002). Pathological gambling can therefore be summarized as a behaviour that creates negative consequences for the gambler himself, others in his social network or for the community (Wynne, 2003).

The opportunities to engage in gambling are great. They range from lottery, scratch tickets and Lotto, to different types of gambling machines, card games like black jack and poker, sports betting, horse racing or roulette. Technological innovation has always played a big role in gambling practice (Griffiths, 1999). Nowadays, the Internet is becoming a popular venue for gambling. In fact, Internet gambling is one of the fastest growing divisions of e-commerce. The gambling landscape is therefore changing. While land-based gambling is declining, Internet gambling is expanding (Gainsbury, Wood, Russell, Hing, & Blaszczynski, 2012). A subject for concern is the introduction of Internet gambling and other remote control gambling developments (such as interactive television gambling and mobile phone gambling) with regard to pathological gambling behaviour. Possibilities to influence the potential addictive characteristics of gambling activities to enhance the impulsion and excitement of the games grow as technology develops (Griffiths, Parke, Wood, & Parke, 2006).

The intent of this study was to assess gambling among Icelandic university students. Problem gambling and gambling participation, online gambling and poker participation were examined. Coping strategies and attitudes towards gambling among Icelandic university students were surveyed as well, in order to find a connection with gambling behavior.

1.1 Problematic Gambling

1.1.1 Definitions of problem and pathological gambling

The terms compulsive gambler and pathological gambler have been used interchangeably to describe individuals with irrepressible impulses to gamble. Other terms like at-risk gambling, problem gambling, in-transition gambling, disordered gambling, Level 2 gambling and excessive gambling have been coined. Each is devoted to a distinct characteristic and classification scheme (Blaszczynski & Nower, 2002). While as Hodgins, Stea, & Grant (2011) state that the terms problem gambling and pathological gambling are in published work currently salient, many others advance the view that problem gambling is the less severe form of gambling compared to pathological gambling (Engwall et al., 2004; Sassen, Kraus, & Bühringer, 2011; Stucki & Rihs-Middel, 2007; Volberg & Steadman, 1988). Exclusive use of the term pathological gambling, as adopted by the official psychiatric classification (Blaszczynski & Nower, 2002), was postulated by Moran (1970). The recent Diagnostic and Statistical Manual of Mental Disorders (DSM-V; American Psychiatric Association, 2013) on the other hand uses the term gambling disorder.

1.1.2 Gambling Disorder according to the DSM-V

The Diagnostic and Statistical Manual of Mental Disorders (DSM-V; American Psychiatric Association, 2013) lists nine criteria of problematic gambling behaviour (Table 1). To be considered as having a mild gambling disorder, individuals have to meet 4 to 5 criteria, 6 to 7 met criteria indicate moderate severity, while meeting 8 to 9 criteria represent a severe gambling disorder. Differentiated are episodic or persistent gambling disorders and if an individual is in early or sustained remission. However, if the gambling behaviour is motivated by a manic episode, the person is not diagnosed as having a gambling disorder.

Table 1. Nine indicators of problematic gambling behaviour according to DSM-V

	Description of the indicator
1	Needs to gamble with increasing amounts of money in order to achieve the desired excitement.
2	Is restless or irritable when attempting to cut down or stop gambling.
3	Has made repeated unsuccessful efforts to control, cut back, or stop gambling.
4	Is often preoccupied with gambling (e. g. having persistent thoughts of reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble).
5	Often gambles when feeling distressed (e.g., helpless, guilty, anxious, depressed).
6	After losing money gambling, often returns another day in order to get even (“chasing” one’s losses).
7	Lies to conceal the extent of involvement with gambling
8	Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling.
9	Relies on others to provide money to relieve a desperate financial situation caused by gambling.

1.2 Gambling in Iceland

1.2.1 Legal gambling environment in Iceland

Compared to other European countries, the Icelandic gambling market is very small (Olason & Gretarsson, 2009). The first Icelandic general gambling law from 1926 (Lotteries and Tombolas Act No. 6/1926) stated that without the permission of the Ministry of Justice and Ecclesiastical Affairs all gambling operations in Iceland were prohibited. Furthermore, all participation in foreign lotteries was forbidden (Ministry of Justice and Ecclesiastical Affairs, 1999). The law was aimed at keeping money in the country and limiting gambling. In the year 1933, the lottery of the University of Iceland was allowed by law and was hence the first legal gambling activity in Iceland (Olason & Gretarsson, 2009).

The Icelandic government received a letter from the European Free Trade Association Surveillance Authority (ESA) in 2004. This letter indicated the violation of the European Economic Area (EEA) agreement by Iceland’s limitation of lottery licenses to just Icelandic companies (Örnberg, 2006). Subsequently, a new Icelandic law on lottery entered into force in July 2005 (Law on Lotteries No.38/2005). Money lotteries are still only allowed to operate with a license from the Minister of Justice and Ecclesiastical Affairs or with particular authorization by law. A license in turn is only obtained by companies, institutions or associations that have the purpose of obtaining money for public benefit in Iceland. Such Icelandic benefits could be cultural and social issues, charity, sports, nursing and international humanitarian work. The Minister of Justice and Ecclesiastical Affairs can also ask lottery license holders to raise funds for research and measures in order to fight problem gambling and its consequences (Law on Lotteries No.38/2005). Those reservations make the Icelandic gambling market for foreign companies very unattractive.

Permitted gambling activities in Iceland today are bingo, scratch-cards, slot machines, monthly lotteries, National Lotto, Viking Lotto, football pools and fixed-odds sports betting (Olason & Gretarsson, 2009). For a long time, the minimum age to participate in gambling machines of the University of Iceland was 16 years (Reglugerð um pappírslaut peningahappdrætti Happpdrættis Háskóla Íslands nr. 455/1993). In 2001, the minimum age for gambling participations in gambling machines of the University of Iceland was raised to 18 years of age (Reglugerð um breytingu á reglugerð um pappírslaut peningahappdrætti Happpdrættis Háskóla Íslands nr. 455 15. nóvember 1993 nr.529/2001). A similar minimum age development made gambling machines that collect money for the Icelandic Red Cross, SAA- National Center of Addiction Medicine and the Icelandic Association for Search and Rescue. The minimum age of gamblers of such machines had to be 16 in 1994 (Lög um Söfnunarkassa nr. 73/1994), and a decade later it was increased to 18 years of age (Reglugerð um söfnunarkassa nr. 320/2005). Except for slot machines, there is no legal age restriction on other gambling operations. Some gambling licensees have established their own age limits though. Several arcades with slot machines, for example, prohibit individuals younger than 20 years old admission to the facility. Furthermore individuals younger than 18 are not allowed to purchase scratch cards and lottery tickets, are not able to bet on football pools and cannot participate in fixed- odds sports betting (Olason & Gretarsson, 2009).

1.2.2 Research history in Iceland

The first study in Iceland that surveyed problem gambling prevalence was conducted in year 2000 by IMG-Gallup. The sample consisted of 1500 Icelanders aged 16 to 75 with a response rate of 70%. The lifetime problem gambling prevalence rate found was 0,6%. Data about current gambling prevalence rate was not collected and the relatively small sample size encumbers the informative value of the survey, but it suggested that more research on gambling in Iceland was needed (IMG-Gallup as cited in Ólason, 2009). In late 2002 the Icelandic gambling project was initiated. The Icelandic gambling project has been financed by the University of Iceland Lottery, with subsidies of the Ministry from the Interior and public research grants, and is situated in the Psychology Department at the University of Iceland. It's intention is to estimate gambling and problem gambling prevalence for the Icelandic adolescent and adult population. First, problem gambling screening instruments had to be chosen and translated into Icelandic. The Problem Gambling Severity Index (Ferris & Wynne, 2001) and the Diagnostic Interview for Gambling Severity (Winters, Specker, & Stinchfield, 2002) were selected for surveying adult populations. In order to get an Icelandic version of

the PGSI two independent translations were made, then back translated by a professional translator. Thereafter, the scale was pretested on 24 students who were not included in the final sample. In a sample of 1266 university students Olason, et al. (2003) found prevalence rates of current gambling of 1,9% for moderate risk gamblers with a PGSI score of 3 to 7 and 0,3% problem gambler with a PGSI score of 8 or more. Chosen problem gambling measurements for adolescents were the Diagnostic and Statistical Manual of Mental Disorders 4th Edition, Multiple Response, Revised for Juveniles (DSM-IV-MR-J; Fisher, 2000) and the South Oaks Gambling Screen Revised for Adolescents (SOGS-RA; Winters, Stinchfield, & Fulkerson, 1993). Gambling participation was surveyed in a sample of 750 16 to 18 year old students in Icelandic upper secondary and comprehensive schools. Of the sample 379 students were male, 371 were female, and the average age was 17,03 years. Of those students, 96,5% had gambled at least once in their life, while 79,1% had gambled during the previous year. Furthermore 10,4% gambled at least once a week during the year preceding the study. According to the DSM-IV-MR-J 2,0% of the student sample were problem gamblers while 3,2% were at risk. The SOGS-RA on the other hand identified 2,7% of the students as problem gamblers and 4,4% as at risk for problem gamblers (Olason, Sigurdardottir, & Smari, 2006). These results denote the DSM-IV-MR-J as a somewhat more conservative measurement compared to the SOGS-RA. A few years later a second survey was performed for students aged 16 to 18, with a larger sample than the first one. With 1513 participants answering the DSM-IV-MR-J, it was found that 3,8% of the students were at risk and 3,0% problem gamblers. Compared to the first sample, gambling prevalence rates were elevated. Furthermore it was found that online gambling was much more common among the students than in the earlier study (Baldursdóttir, Ólason, Grétarsson, Daviðdóttir, & Sigurjónsdóttir, 2008). A second study on gambling behaviour of adolescents, done in 2004, was conducted on 3511 pupils (which are 77% of all adolescent in this age cohort in Reykjavik) of primary schools in Reykjavik, aged 13 to 15 years. Of all the participating students 93% had gambled at least once in their lifetime, 70% had gambled in the former year and 8% gambled at least once a week in the previous year. Problem gamblers were 1,9% of the sample and 3,7% at risk gamblers based on the DSM-IV-MR-J while as the SOGS-RA found 2,8% problem gamblers and 4,1% at risk gamblers. Both measures indicated that boys had more gambling problems than girls (Olason, Skarphedinsson, Jonsdottir, Mikaelsson, & Gretarsson, 2006).

Adults aged 18 to 70 years were surveyed in three random national samples. In the first one, conducted in 2005, 3358 out of 5000 invited adults took part in the study. The response rate

was therefore 69,8%. The PGSI was used to measure problem gambling which specified 1% of the adults as problem gamblers and 0,5% as probable pathological gamblers (Ólason, Barudottir, & Gretarsson, 2006). A second survey was performed in 2007. In the sample of 3009 Icelandic adults 67% had gambled at least once in the year prior to the study. Based on the PGSI 1,3% of the sample could be identified as problem gamblers and 0,3% as probable pathological gamblers. Compared to the previous sample, more people gambled on a regular basis (once a week or more). Furthermore, more Icelandic adults gambled on foreign websites than before. The development towards online gambling was first and foremost among Icelandic men (Ólason, 2008). In a third survey conducted in 2011, 1887 Icelandic adults participated. Compared to the survey conducted in 2007 the number of Icelandic adults who gambled at least once in the year prior to the study increased to 76%. The PGSI was used to measure problem gambling prevalence. Problem gamblers were 1,7% of the sample, probable pathological gamblers 0,8%. In comparison with both national surveys executed in 2005 and 2007, the problem gambling prevalence found in the latest survey was elevated (Ólason, 2012).

When gambling prevalence rates of the different groups are compared, it can be seen that students aged 16 to 18 years had the highest rates of gambling prevalence, followed by the younger students aged 13 to 15 years. Problem gambling rates of University students and adults were lower and did not differ much from each other.

1.4 Gambling Prevalence

Surveys on problem gambling prevalence are important to determine the problem's extent. Such research can highlight gambling trends, subgroups with higher risk can be identified, problem gambling and its connection to gambling availability can be observed and resources for prevention can be detected (Sassen et al., 2011).

1.4.1 Gambling Prevalence in general adult populations

Problem gambling prevalence rates in adult populations differ slightly between countries. Sassen, Kraus & Bühringer (2011) conducted a meta-analysis of gambling prevalence. They included 39 studies with sample sizes ranging from 104 participants to 34770. Screening instruments differed between surveys. Sassen, Kraus & Bühringer (2011) found past year prevalence rates for the adult total population in different countries range from 0,1% to 4,5% for problem gambling and from 0,02% to 2,0% for pathological gambling. The highest rate of 4,5% problem gambling prevalence was found by Cox, Enns, & Michaud (2004) in Canada,

followed by 4% problem gambling prevalence in China (Wong & So, 2003). The lowest prevalence rates for problem gambling of 0,1% was found in Switzerland (Brodbeck, Duerrenberger, & Znoj, 2009) followed by 0,3% in Germany (Bühringer, Kraus, Sonntag, Pfeiffer-Gerschel, & Steiner, 2007). The highest pathological gambling prevalence rate of 2% was found in the province Prince Edward Island, Canada (Doiron & Nicki, 2001) and Australia (Gill, Grande, & Taylor, 2006). The lowest pathological gambling prevalence rate of 0,02% was found in Switzerland (Brodbeck et al., 2009) followed by 0,15% in Norway (Götestam & Johansson, 2003).

In an earlier meta-analysis, studies on adult populations conducted between years 2000 and 2005 with participants ≥ 15 years old were analysed. The meta-analysis included 32 studies. Past year prevalence rates for problem gambling within adult populations ranged from 0,4% to 4,7% whereas past year prevalence rates for pathological gambling were found to be between 0,15% to 2,1%. In European countries the lowest gambling rates were found while Asia reported the highest rates of exaggerated gambling (number of people with problem gambling and number of people with pathological gambling). Across-the-board prevalence rates were found to be rather steady across survey instruments as well as between countries (Stucki & Rihs-Middel, 2007).

In order to compare foreign gambling prevalence rates to the Icelandic one, only surveys with current prevalence rates were considered. Furthermore, research which examined a similar age range was selected. Gambling prevalence studies in Nordic countries which fit those criteria were chosen to compare Icelandic rates to its neighbouring countries. Rates of probable pathological gambling prevalence in Nordic countries range from 0,1% to 1,0%. A survey done in Finland shows the highest prevalence rate for probable pathological gambling with 1,0% (Aho & Turja, 2007 as cited in Jaakkola, 2009) followed by the results of the Icelandic adult population with 0,8% probable pathological gambling prevalence (Ólason, 2012). Prevalence rates for problem gambling in Nordic countries ranged from 0,3% to 2,1%. The Finnish adult population has the highest prevalence rate for problem gambling with 2,1% (Aho & Turja, 2007 as cited in Jaakkola, 2009) followed by the Swedish adult population with 1,9% (Statens folkhälsoinstitut, 2009). Iceland's problem gambling prevalence rates of 1,7% (Ólason, 2012) are comparable to those found in Sweden (Statens folkhälsoinstitut, 2009).

Denmark reports the lowest problem- and probable pathological gambling prevalence rates in the Nordic countries with 0,1% prevalence for pathological gambling and 0,2% for probable pathological gambling (Bonke & Borregaard, 2006 as cited in J. Linnet, 2009) followed by the Norwegian adult population with 0,3% probable pathological gambling prevalence and 0,4% problem gambling prevalence (Bakken, Götestam, Gråwe, Wenzel, & Øren, 2009). Compared to the prevalence rates found in the meta-analysis of Sassen et al. (2011) and the earlier meta-analysis of Stucki & Rihs-Middel (2007), problem- and pathological gambling prevalence rates of Nordic countries are relatively low. Table 2 displays prevalence rates found in general adult populations in Nordic countries, sorted by the year of publication.

Table 2. Prevalence rates of problem gambling in general adult populations in Nordic countries

Year	Author	Country	Measurement	Prevalence	Participants
2006	Bonke & Borregaard (as cited in Linnet 2009)	Denmark	NODS SOGS-R	Past year: 0,1% pathological gambler (NODS 5+) and 0,3% problem gamblers (NODS 3-4) In the last 12 month: 0,2% probable pathological gamblers (SOGS 5+) and 0,8% problem gamblers (SOGS 3 – 4)	8153 adults aged 18 to 74 years.
2007	Aho & Turja (as cited in Jaakkola 2009)	Finland	SOGS-R	In the last 12 month: 1,0% probable pathological gamblers (SOGS 5+) and 2,1% problem gamblers (SOGS 3 – 4)	5008 adults aged over 15 years.
2009	Bakken, Götestam, Gråwe, Wenzel, & Øren	Norway	NODS	Past year: 0,3% pathological gambler (NODS 5+) and 0,4% problem gamblers (NODS 3-4)	3482 adults aged 16 to 74 years
2009	Statens folkhälsoinstitut	Sweden	PGSI	Current prevalence rate: 0,3 pathological gamblers and (PGSI 8+) 1,9% problem gamblers (PGSI 3 – 7)	8167 adults aged 16 to 84 years
2012	Ólason	Iceland	PGSI	Current prevalence rate: 0,8 pathological gamblers and (PGSI 8+) 1,7% problem gamblers (PGSI 3 – 7)	1887 adults aged 18 to 70 years

Even though all of these surveys evaluated current prevalence rates, different kinds of measurements were used. This in turn can have an influence on the varying gambling rates and reduces their comparability. The different age groups and sample sizes in these studies could have influence on the findings as well. The Icelandic current prevalence rate for pathological gambling of 0,8% in the adult population is quite high compared to the other Nordic countries, but compared to prevalence rates found in Canada or China not eye-catching. The same applies to the Icelandic current problem gambling prevalence rate of 1,7%.

1.4.1.1 Different gambling types in adult samples

There is a wide selection of available games for potential gambling participation. Dice games, lotteries, card games, slot machines, sport games and pari-mutuel gambling are types of games that are prominent today (Thrasher, Andrew, & Mahony, 2011). Some games are more popular than others among adults. Ólason, Bárudóttir, and Grétarsson (2006) found that the most popular game played by the Icelandic population in 2005 was Lotto, followed by scratch tickets and slot machines. In national surveys performed in 2007 and 2011, Lotto was still the most popular game, followed by class lottery and scratch tickets (Ólason, 2008, 2012). An epidemiological study in Norway revealed that adults in Norway also played most often Lotto, followed by football tip and slot machines (Götestam & Johansson, 2003). In Sweden, Lotteries were the most popular games as well, followed by Lotto, Keno and Joker and horse betting. Men and women had the same game preferences, although women played all those games a little less frequently than men (Statens folkhälsoinstitut, 2009). Three prevalence surveys carried out in Great Britain (Sproston, Erens, & Orford, 2000; Wardle et al., 2011; Wardle et al., 2007) showed that British adults favour the national lottery draw, followed by scratch tickets, slot machines and horse race betting. Slot machines were a little more popular than horse races in 1999, but horse race betting gained popularity in 2007 and has remained so in 2010. In a state-wide household survey done 2006 in New York, Rainone, Marel, Gallati, and Gargon (2007) found that the state lottery tickets were by far the most popular gambling activity. Tickets were purchased by 16% of the adults that played Lotto at least once a week, while 53% played Lotto in the past year. The next popular gambling activities were raffles, pools and card games. In a South Australian prevalence survey, adults preferred also to play Lotto, followed by gaming machines and scratch tickets (Gill et al., 2006). In all the mentioned studies done on the general adult populations in different countries, playing Lotto is the most frequent gambling activity.

Icelandic adults who were moderate risk gamblers or probable pathological gamblers played mostly Lotto and slot machines, followed by scratch tickets and Poker (Ólason, 2008). Four years later Poker was the most popular game among Icelandic moderate risk gamblers and probably pathological gamblers, playing Lotto came second place followed by slot machines (Ólason, 2012). In both Icelandic national surveys it was found that adults with gambling problems indulged in a significantly wider variety of games than participants without gambling problems (Ólason, 2008, 2012). Adult problem gamblers in Finland preferred to play slot machines, followed by Lotto and scratchcards (Valkaman 2006 as cited in Jaakkola,

2009). The national helpline for problem gamblers in Sweden reported the main types of gambling among people seeking help were slot machines, followed by internet poker and casino games (Spelinstitutet, 2006 as cited in Jonsson & Rönnerberg, 2009). It is noticeable, that compared to the games chosen by the general adult populations, adults with gambling problems were more likely to name poker as a frequently played game.

1.4.2 Gambling Prevalence in student populations

European surveys conducted on university students are rare. Blinn-Pike, Worthy & Jonkman (2007) explain the lack of research on gambling behaviour of college students with the condition that college students are in between adulthood and adolescents (socially and developmentally). As European university student gambling prevalence rates are scarce, Icelandic gambling prevalence rates were compared with American, Canadian and Chinese student gambling samples.

In an Icelandic survey, 1266 students from eight different universities participated. About 54% of the sample was cohabiting or married. The mean age of the 442 male participants was 26,5 while as the mean age of the 822 female participants was 27 (Olason et al., 2003). In a Canadian sample of 585 university students, the mean age was 21,7 years and 61% of the students were female (Williams, Connolly, Wood, & Nowatzki, 2006). The Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001) was used in both surveys to determine problem gambling. The overall gambling participation was similar. Around 75% of the Icelandic students had gambled at least once during the last 12 months while as 72% of the Canadian students gambled at least once six months prior to the study. The gambling prevalence rate in the Canadian student sample was more than three times higher for moderate risk gamblers (6,2%) than found in the Icelandic sample (1,9%), while the prevalence rate for problem gambling was close to five times higher (1,4%) compared to the one found in Iceland (0,3%) (Olason et al., 2003; Williams et al., 2006). Icelandic male students were significantly more likely to be moderate risk or problem gamblers: students with a PGSI score of 8 or more were all-male (Olason et al., 2003). Most of the Canadian problem gamblers were older than students without gambling problems, of Asian ethnicity, and had superior gambling maths skills (Williams et al., 2006).

In a meta- analysis of 15 studies conducted on college students in Canada and the USA, the proportion of lifetime disordered gambling was surveyed. All 15 gambling studies used the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987). Students with SOGS scores

of 5 or more were classified as disordered gamblers. Among the 15 surveys the percentage of students with disordered gambling behaviour was rather heterogeneous. The standard deviation of disordered gambling prevalence rates between studies was 4,44%, In other words, after controlling for gender, the prevalence rate found in a study population might deviate from the North American student population by 4,44%. The overall disordered gambling prevalence rate found among college students was 7,89% (Blinn-Pike et al., 2007). Compared to the Canadian sample of Williams et al. (2006) the prevalence rate for disordered gambling or problem gambling was slightly higher. This can also be explained by the fact that Blinn-Pike, et al. (2007) considered lifetime gambling while as Williams et al. (2006) surveyed gambling prevalence of the past six months.

Another survey that measured lifetime gambling was done by Engwall, Hunter & Steinberg (2004). In a sample of 1348 students from four different universities in Connecticut problem gambling prevalence was estimated via a shortened version of the SOGS. More women participated (64%) in the research than men (36%). The majority of the sample was between 18 to 20 years (50%) and 21 to 25 (35%) years old. Most of the students (67%) had gambled in their lifetime. Problem gamblers made up 6,2% of the students with a SOGS score of three or four, whereas pathological gamblers with a SOGS score of five or more made up 5,2%. Most of the social gamblers used household money as primary source to borrow money. Problem and pathological gamblers on the other hand, were significantly more likely to borrow money from family, use credit cards, sell property or get bookie loans.

In a student sample of 1007 American undergraduate students, Weinstock and Petry (2008) administered the SOGS to measure lifetime gambling prevalence as well. Only the cut off score of ≥ 5 to identify probable pathological gamblers was used, whereas all students with scores ≤ 4 were classified as non-pathological gamblers. The average age of the students was 21,4 (SD = 4,7) years and 38,3% of the students were male, while 61,7% of the students were female. Many students (89,1%) have gambled at least once in their lifetime. Probable pathological gamblers made up 8,9% of the sample, which is 10% of the students that had gambled at least once in their lifetime. Since the standard deviation between studies found by Blinn-Pike, Worthy and Jonkman (2007) was high (4,44%), the rather high prevalence rate of probable pathological gamblers in the student sample of Weinstock and Petry (2008) as well as the lower prevalence rate found by Engwall, Hunger & Steinberg (2004) were still consistent with the findings of Blinn-Pike, Worthy and Jonkman (2007). Huang, Jacobs,

Derevensky, Gupta and Paskus (2007) surveyed 20739 U.S. college student-athletes and used the DSM-IV Gambling Screen (Stinchfield, Govoni, & Frisch, 2005) methodology with a 12-month time frame. In this national student-athlete sample, 1,2% of male students could be identified as pathological gamblers and 3,1% as problem gamblers. Female athletes were less likely to have gambling problems, as 0,3% could be classified as problem gamblers and 0,1% as pathological gamblers. Compared to the other American college student surveys the gambling prevalence rates among student-athletes was not particularly elevated which might be explained by the 12 month time frame used.

Gambling prevalence rates among Chinese college students could differ from those of other countries due to the high acceptance of gambling in the Chinese culture paired with diverse gambling opportunities, which might enhance vulnerability for problem gambling (Blaszczynski, Huynh, Dumlao, & Farrell, 1998). Wu and Tang (2012) recruited Chinese college students from diverse universities. The study had a response rate of 62% and consisted of 932 participants aged 18 to 25. Lifetime probable pathologic gambling (C-SOGS ≥ 5) was found to be 8%. The mean age of the sample was 20,64 years (SD = 1.49) with 456 male participant, 464 female and 12 who didn't identify their gender. 86% of the students had gambled at least once in their lifetime. Even though the probable pathologic gambling prevalence rate and the overall gambling participation found in the Chinese sample was quite high, the sample of Weinstock and Petry (2008) reported similar gambling prevalence rates.

Prevalence rates of probable pathological gambling in these student samples range from 0,3% up to 8,9%. But as different measurements were used to evaluate prevalence rates, the comparability of prevalence rates between the surveys is decreased. Furthermore the Canadian and the Icelandic research as well the as U.S. college student-athletes research (Huang et al., 2007; Olason et al., 2003; Williams et al., 2006) were the only ones evaluating current gambling prevalence while the others focused on lifetime prevalence, which explains the lower prevalence rate of pathological gambling in those three studies compared to the other student samples. Moreover, different types of sampling designs used in those studies. While as Huang et al. (2007) used a stratified sample and estimated the response rate between 65% - 75%, Wu & Tang (2012), Weinstock and Petry (2008), Williams et al. (2006), Engwall et al. (2004) and Ólason et al. (2003) used convenience samples. Conclusions drawn from convenience samples must be handled with care.

The Icelandic university student sample had by far the lowest pathological and problem gambling prevalence rates of all the mentioned surveys (Olason et al., 2003). The time frame surveyed could have an influence, especially in student samples. LaBrie (2003) pointed out that the prevalence during school excluding summertime might differ from prevalence during summer as students may have disposable income while having a summer job which could alter the prevalence rates during the summer.

This idea is consistent with findings of Martin, Usdan and Turner's (2012) three-month study of 20 college students who had experienced disorderd gambling in their lifetime. Gambling became more or less serious from month to month. Moreover, five students who were screened as having a gambling disorder at one point in their life no longer had gambling-related problems when the study was conducted. Nevertheless, students who showed more gambling problems were less likely to change.

Additionally, Barnes, Welte, Hoffman & Tidwell (2010) performed a study to determine whether or not there is a difference between college students and non-college young people, in terms of gambling. They found no significant difference between those two groups when considering gambling participation in general. Those findings demonstrate that even though research is conducted on college students rather than young adults at the same age, it is important to take into account that problem gambling might be a characteristic of young adulthood regardless of college status.

Among non-college young adults though, there were significantly more participants who gambled 52 times or more during the past year than among college students. Furthermore, non-college females had twice the rate for frequent gambling (12%) than female college students (6%). Female non-college young adults were also significantly more likely to have scores of two or more on the SOGS-RA than female college students. Browne & Brown (1994) found that students were more likely to decrease gambling when entering college. It might be that the college environment modifies gambling behaviour.

1.4.2.1 Different gambling types in student gambling

The most common gambling activity in the Icelandic student sample was Lotto, which 55,7% of the students played at least once in the twelve months prior to the study, followed by slot machines (38%) and scratch tickets (30,2%). Bingo on the other hand was the least popular gambling type among the Icelandic students with 3,5% participating (Olason et al., 2003). Student samples in America, Canada and China showed that playing lottery, card games, betting on games of skills and using slot machines were most popular among students

(Engwall et al., 2004; Martens et al., 2009; Huang et al., 2007; Weinstock & Petry, 2008; Weinstock, Whelan & Meyers, 2008; Williams et al., 2006; Wu & Tang, 2012).

The average number of venues where the Canadian college students gambled was 1.7 (Williams et al., 2006). Engwall et al. (2004) found in a student sample of four universities in Connecticut the average number of games students were playing was 2,6. Problem (M = 5,6) and pathological gamblers (M = 6,1) played a significantly a broader range of games than did social gamblers (M = 3,2). Moreover, men played significantly more different kinds of games (M = 3,3) than women (M = 1,9). Men and women also differed in their choice of games. The top five gambling activities women engaged in were lottery, casino gambling, slot/poker machines, bingo and playing cards. Men's favourite games were lottery, followed by playing cards, betting on sports, skill games and casino gambling. Furthermore, men were four times more likely to have played games of skill for money or bet on sports, three times more likely to have bet on animals and twice as likely to have played dice games. Pathological gamblers used all gambling activities twice as frequently compared to problem gamblers. Social gamblers were not frequent users of any of the gambling venues (Engwall et al., 2004).

In a sample of 159 university students, Weinstock, Whelan and Meyers (2008) found participants gambling an average of 9.3 (SD = 9,96) times during the past six months for a total of 21,8 hours (SD = 26,63). Students classified as pathological gamblers, gambled more often and for a longer duration each month. That pathological gamblers were significantly gambling more frequently and with greater amounts of money than non pathological gamblers was also observed by Weinstock and Petry (2008). Higher gambling frequency was related to more gambling problems than lower gambling frequency (Martin et al., 2012).

Pathological gamblers preferred to play cards for money and bet on sports as well as skill games. Problem gamblers on the other hand were mostly engaged in lottery and betting on sports (Engwall et al., 2004).

1.4.3 Comparison of gambling prevalence in student and general adult populations

Compared to adult samples, gambling prevalence rates in student samples are elevated. This was also found in a meta-analytic study conducted in Canada and USA (Shaffer, Hall, & Vander Bilt, 1999). The meta-analysis of 16 surveys conducted among college students found lifetime pathological gambling prevalence to be 4.67% and the lifetime prevalence rate for sub-clinical levels of gambling problems of college students was 9.28%. Another meta-analysis including 50 surveys found lifetime pathological gambling prevalence among the general adult population to be 1,60% while the lifetime prevalence for sub-clinical levels of gambling problems was 3,85% (Shaffer et al., 1999). Two years later an updated meta-

analysis in USA and Canada was carried out. Summarizing 19 gambling prevalence surveys among college students, the lifetime prevalence for pathological gambling added up to 5,56, while the lifetime prevalence rate for sub-clinical levels of problem gambling was 10,88%. The lifetime prevalence rates in the general adult population increased as well. A summary of 66 surveys regarding pathological gambling indicated that the lifetime prevalence of pathological gambling was 1,92%, while as the lifetime prevalence rate for sub-clinical gambling problems added up to 4,15% (Shaffer & Hall, 2001). A more recent meta-analysis of college students in Canada and USA indicated a lifetime prevalence rate of 7.89% for disordered gambling. Differing from the meta- analysis mentioned above, only studies that used the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987) were considered in the study (Blinn-Pike et al., 2007). Blinn-Pike, Worthy and Jonkman (2007) assume that the increase of problem and pathological gamblers over the years may be due to the rise in gambling opportunities.

When the mentioned studies of adult gambling and student gambling prevalence are compared, it is obvious that students were much more likely to be problem gamblers than adults (Bonke & Borregaard, 2006 as cited in Bakken et al., 2009; Engwall et al., 2004; Huang et al., 2007; Linnet, 2009; Ólason, 2012; Olason et al., 2003; Sassen et al., 2011; Statens folkhälsoinstitut, 2009; Stucki & Rihs-Middel, 2007; Weinstock & Petry, 2008; Williams et al., 2006; Wu & Tang, 2012). It should be taken into account that the surveys that considered the adult population exclusively dealt with current gambling prevalence, while the student samples consisted of both lifetime and current gambling prevalence. In lifetime prevalence research the gambling prevalence rates found were higher (Blinn-Pike et al., 2007; Engwall et al., 2004; Weinstock & Petry, 2008; Wu & Tang, 2012). If the current students prevalence gambling rates alone were compared to the adult prevalence rates, the student rates remain elevated (Huang et al., 2007; Ólason, 2012; Olason et al., 2003; Sassen et al., 2011; Stucki & Rihs-Middel, 2007; Williams et al., 2006).

1.5 Demographics of gambling

1.5.1 Demographics of gambling in general adult populations

In almost every gambling research conducted on adult populations, males were more likely than females to have gambling problems (e.g. Götestam & Johansson, 2003; Lostutter, Larimer, Neighbors, & Kaljee, 2011; Olason, Barudottir, et al., 2006; Petry & Mallya, 2004; Volberg, 2004; Volberg, Abbott, Rönnerberg, & Munck, 2001). Men also participate more often in online gambling than women (Götestam & Johansson, 2003; Ólason, 2008, 2012; Wardle

et al., 2011). Additionally, Wardle et al. (2011) found that men indulged in more gambling activities ($M = 2,3$) than women ($M = 1,6$). Marital status also seems to play a role. Some studies have shown that singles are more likely to gamble than individuals living in a marriage or in a relationship (e.g. Götestam & Johansson, 2003; Martinotti et al., 2006; Olason et al., 2006; Volberg et al., 2001). Other surveys show that divorced individuals seem to be slightly more likely to gamble than married individuals, but both groups are more likely to gamble than singles (= individuals who have never been married) or widowed individuals (Sproston et al., 2000; Wardle et al., 2011; Wardle et al., 2007). Gambling behaviour is related to education and income. Low education levels and low income have been associated with greater rates of problem Gambling (Olason, Barudottir, et al., 2006; Scherrer et al., 2007; Volberg et al., 2006; Wardle et al., 2011). Age seems also to play a role, as problem gamblers are often younger than non-problem gamblers (Gill et al., 2006; Götestam & Johansson, 2003; Olason, Barudottir, et al., 2006).

1.5.2 Demographics of gambling in student populations

As in the general adult population, male students were much more likely to gamble than female students (Browne & Brown, 1994; Huang et al., 2007; LaBrie et al., 2003; Lightsey & Hulse, 2002; Olason et al., 2003; Stuhldreher, Stuhldreher, & Forrest, 2007). Furthermore, male students were also more likely to be problem and pathological gamblers than female students (Engwall et al., 2004; Huang et al., 2007; Olason et al., 2003; Stuhldreher et al., 2007; Weinstock & Petry, 2008). Students who gambled were older than 20 (LaBrie et al., 2003) and more probable to have parents and peers who gamble. Moreover, students who had parents with a gambling problem were more likely to be pathological gambler themselves. King, Abrams and Wilkinson (2010) found that a family history of gambling problems and the disposition to experience negative emotions, especially for males, can predict not only gambling problems but also time spent gambling. Additionally, men were more affected by having gambling friends than women, which was related to spending more money on lotteries and doing so more frequently (Browne & Brown, 1994; Weinstock et al., 2008). Furthermore, college students with parents who did not have a 4- year college degree were at higher risk to become problem gamblers (LaBrie et al., 2003). In line with that, the grades of students who were pathological gamblers were significantly lower than the ones of non-pathological gamblers (LaBrie et al., 2003; Weinstock et al., 2008).

Olason et al. (2003) and LaBrie et al. (2003) found that relationship status played a role. University students who were married or living together with a partner were less likely to gamble than single students.

Availability seemed to play a role in gambling behaviour as well. Local gambling exposure, e.g. having two or more legalized forms of gambling in the state where students studied, was related to more gambling (LaBrie et al., 2003). Demographic variables, though, were found to play just a small role in pathological gambling status (Weinstock et al., 2008).

1.6 Online gambling

At all times, technological innovation has played a role in gambling practice (Griffiths, 1999). The Internet gambling industry is growing and developing fast which in turn influences gambling behaviour. The term online gambling is often replaced by the term Internet gambling and denotes all forms of gambling via Internet. Nowadays it is possible to do so by using all kinds of wireless devices, mobile phones and computers (Gainsbury et al., 2012). Since the introduction of the Internet, a new point of concern regarding problematic gambling behaviour has increased (Griffiths, Parke, Wood, & Rigbye, 2010).

1.6.1 Prevalence of online gambling

Several surveys have been performed to measure the amplitude of online gambling. In 2011 an Icelandic adult survey was conducted. 18,9% of the sample had gambled at least once online in the year before the study. In an Icelandic adult sample from 2007 just 15% of the adults did so. Furthermore, 1,6% of the sample in 2007 had gambled on foreign websides at least once the year prior to the study, while in 2011 3,3% had done so. Online gambling has therefore grown in popularity among Icelandic adults (Ólason, 2008, 2012).

Icelandic adolescents replicated this developement. In a survey arranged in the school year 2003 - 2004 1,9% of the 13 to 15 year old adolescents gambled online the year preceding the survey (Olason, Skarphedinsson, et al., 2006). Of the Icelandic adolescents who were aged 16 to 18 in spring 2003 2,4% gambled online the year prior to the study (Olason, Sigurdardottir, et al., 2006). Two years later 16% of adolescents 16 to 18 years of age had already gambled online at least once in the year preceding participation in the survey (Baldursdóttir et al., 2008). Furthermore, in the school year 2007 – 2008 almost one fourth (24,3%) of adolescents 13 to 18 years of age had gambled online at least once in the past 12 months prior to the study (Olason et al., 2010).

The same trend could be observed in two national surveys in Britain. The Internet was used to gamble by 14% of the adults prior to the study in 2010 while 6% of the participants in the survey 2007 gambled online in the past year. Online gambling increased more among women than men. This large difference in gambling prevalence rates can be attributed to a more

conservative measure in the British survey conducted in 2007, where purchasing Lotto tickets online was not taken into account. Applying the same measure in the survey from 2010. Internet gambling had grown from 6% in the year 2007 to 7% in 2010 (Wardle et al., 2011; 2007).

In the two Icelandic and both British studies, men were more likely to gamble online than women. In both Icelandic samples it was found that participants with higher income gambled more online than others with less income. Being in the age group of 26 to 40 years predicted online gambling and individuals who were married, living together with their partner or were divorced gambled more often online than singles or widowed individuals (Ólason, 2008, 2012). Age group and relationship status could be related though. In a Canadian telephone survey with 8498 participants, Wood and Williams (2009) identified 179 Internet gamblers (2,1%). Most of the online gamblers were male (82,4%) and were rather educated (ranging from 1 = non schooling to 9 = professional degree/graduate degree, online gambler had an average of 6,48). Most online gamblers were married or living in a relationship (45,7%). In a study carried out among U.S. adults who were waiting at medical and dental clinics, 6,9% of the 1414 participants had gambled on the Internet at least once in their lifetime (Petry, 2006). 2,8% Internet gamblers gambled frequently. Individuals who had tried to gamble online were most likely singles (59,6%) as well as the more frequent Internet gamblers (36,6%) who gambled online more than 10 times. In both groups, lifetime probable pathological gambling prevalence rates (SOGS ≥ 5) were elevated (29,8% and 65,9% respectively) compared to non-Internet gamblers (7,6%).

Online gambling seems to be undergoing a rise in popularity. A decade ago, Griffiths (2001) found in a prevalence study just 1% of the individuals had gambled occasionally on the Internet (less than once a week) and none of the participants gambled regularly online. Moreover Petry and Mallay (2004) carried out a survey among 2986 employees at a university health center where 1,2% had tried gambling on the Internet and 0,1% had gambled online more than 10 times. The majority of their sample was female which could have an influence on the gambling prevalence rate found. Taking into account only the newer surveys (from 2007 forward), online gambling participation in the different samples ranges from 2,1% to 18,9%, depending on whether or not purchasing a Lottery ticket online are included (Ólason, 2008, 2012; Wardle et al., 2011; Wardle et al., 2007; Wood & Williams, 2009).

It is important to note that those online gambling surveys also used different time frames. Some sample online gambling behaviour in the past year, others over the individual's lifetime. This factor makes it difficult to draw correct comparisons.

1.6.2 Online gambling in student populations

Students these days must have access to a personal computer. Internet gambling is therefore accessible at any time (Engwall et al., 2004). A recent online survey among 209 university students in the U.K. who gamble online revealed that the dispersal of online problem gambling is plentiful. Of these students 60% were male and 40% female and their age ranged from 18 to 29 years with the average of 21,4 years ($SD = 4,39$). The response rate of the sample was 34,8%. In order to evaluate problem gambling behaviour, the SOGS was administered. Among those students 13% were probable pathological gamblers ($SOGS \geq 5$) and 47% at risk gamblers ($SOGS \geq 1$ and ≤ 4). In both groups there were more male students than female ones (Yani-de-Soriano, Javed, & Yousafzai, 2012). The observed prevalence rates are unusually high. This might be due to the fact that the SOGS (Lesieur & Blume, 1987) cut-off score of 1 to 4 for at risk gambling is relatively broad. Yani-de-Soriano, Javed, & Yousafzai (2012) observed that students who were probable pathological gamblers had a significantly higher degree of relationship problems with their partner, friends, family or teachers, followed by the at-risk gamblers. Furthermore, probable pathological gamblers were significantly more likely to have a higher degree of academic problems than at-risk gamblers and non-problem gamblers. Having parents that gamble was significantly likely to be the case among students who were probable pathological gamblers (53%), 25% of the students who were at-risk gamblers and 17% of the non-problem gamblers had parents that gamble. Additionally, having peers that gamble was significantly more common among probable pathological gamblers (78%) than at-risk gamblers (67%) and non-problem gamblers (34%). Another online survey conducted among 148 online gambling university students of Tasmania administered the CPGI (Ferris & Wynne, 2001). The self selected sample consisted of 108 males (73%) and 40 females (27%) and students were aged between 18 and 59 years ($M = 24,98$ years, $SD = 7.6$) who gambled at least once online in the past three month. Of the students, 10,8% were identified as problem gamblers (CPGI score ≥ 8) and 15,5% at-risk gamblers (CPGI score ≥ 3 and ≤ 7) (Ly, 2010). Compared to the study of Yani-de-Soriano, Javed, & Yousafzai (2012), prevalence rates of problem gambling were not as high but then two different measurements were used.

Matthews, Fransworth and Griffiths (2009) sent 3000 students their survey via e-mail. 127 university students of the U.K. who were self defined online gamblers and had gambled on the Internet at least once in their lifetime answered the invitation. The average age of the sample was 20,8 and 68% were male while 32% were female. The SOGS was the measure of choice for problem gambling. Students with a SOGS score between 3 and 4 were classified as problem gamblers (18%) while as students with a SOGS score of 5 and more were identified as probable pathological gamblers (19%). Probable pathological gamblers were more likely to gamble online 2 to 5 times a week or every day, compared to problem gamblers and non-problem gamblers. The prevalence rate of 19% probable pathological gamblers can be compared to the 13% probable pathological gambler prevalence rate of Yani-de-Soriano, Javed & Yousatzai (2012), since both surveys used the same measurement and the same cut off score. In all three studies it is notable that students who gamble online have elevated prevalence rates of problem gambling. This in turn could either mean that Internet gambling is more addictive or that individuals with gambling problems gamble more often online than those who have no gambling problems (Wood & Williams, 2007).

1.6.3 Online gambling vs. Land-based gambling

Since online gambling is rapidly growing (Gainsbury et al., 2012), the question arises as to whether there is a difference between users of online and land-based venues. Gainsbury, Wood, Russell, Hing, and Blaszczynski (2012) looked into who is gambling online and why. In an online study, 6682 Australian gamblers responded and 4724 completed the entire survey. The completion rate was therefore 64,4%. The participants were aged 16 to 100 years ($M = 45$ years, $SD = 15,1$), in most cases they were married (46%), male (86%) and employed full time (59%). The majority of the sample (70%) gambled at least once online in the past year and were therefore classified as Internet gamblers. Those who did not gamble online in any form were classified as non- Internet gamblers. Internet gamblers had higher income than non Internet gamblers, were better educated and more likely to be male and married. There was no significant difference of age between those two groups. Non-Internet gamblers on the other hand were more often never married, divorced or separated, compared to online gamblers. Internet gamblers gambled on a higher frequency (2 - 3 times a week or 4 or more times a week) than non internet gamblers. To not have to leave the house and drive somewhere was perceived as the best advantage of online gambling (54,9%), followed by the 24 hours availability (46,2%) and the fact that crowds can be avoided (31,%). Wood, Williams, & Lawton (2007) examined as well, why Internet gamblers prefer online gambling over land-

based venues. Data came from an online survey conducted in 2003 to 2004 among 1920 American online gamblers. If an individual insinuated that he favoured online gambling, he got an open-ended question to explain the reason for that preference. 536 online gamblers answered that open-ended question which implies 38% of all the online gamblers preferred online gambling over terrestrial gambling. Convenience was cited most often (12,9%) followed by ease (12,2%) and comfort (11,7%). Distance from casino (10%) and privacy (9,8%) were also reasons often cited for favouring online gambling. Even though reasons for preferring online gambling venues are labelled differently in those two surveys (Gainsbury et al., 2012; Wood et al., 2007), they are quite similar.

In a study of 8498 Canadian adults contacted via telephone and 12521 participants completing one or more sections of an online survey, Wood and Williams (2009) found that problem gambling was three to four times higher among online gamblers than land-based gamblers (problem gambling was evaluated with 29 items comprising four different gambling scales). A few years earlier, Petry (2006) made similar observations. In a sample of 1414 American adults, recruited in the waiting areas of a medical and a dental clinic, internet gambling was researched. 70% of the sample was female. Of all adults approached, 80% participated in the study. Problem gambling was measured with the SOGS (Lesieur & Blume, 1987) with the cut off score of $5 \geq$ to categorise probable pathological gamblers. Of the U.S. adults, 1316 (93%) had never gambled on the Internet, 57 (4%) had gambled online one to ten times and 41 (3%) had gambled online 10 times or more. Of the regular online gamblers (10 times or more), 65,9% were classified as probable pathological gamblers, 29,8% of the online gamblers who gambled one to ten times online and 7,9% of the participants who never gambled online were identified as probable pathological gamblers. Participants who gambled regularly online were therefore much more likely to have gambling problems than individuals who did not gamble online or had just a few times in their life.

In student samples those findings were replicated. Griffiths & Barnes (2008) contacted 2000 university students via e-mail. 473 self-selected students answered the online survey. Those students were between 18 and 52 years old ($M = 22$; $SD = 5,7$) and 213 were male, 260 female. The SOGS (Lesieur & Blume, 1987) was applied to measure problem gambling. Students who scored 5 or more on the SOGS scale were identified as probable pathological gamblers. Of the students 371 (78%) had gambled on terrestrial venues, on the Internet just 105 (22%). Male students were more likely to gamble on the Internet (42%) than females (6%). Probable pathological gamblers were 5,5% of the surveyed students. Of those 77%

were online gamblers and 23% non-online gamblers. Furthermore, males (10%) were more likely to be problem gamblers than females (2%).

These findings suggest that Internet gamblers prefer online venues because of the benefits that online gambling provides and that these features are perceived as unavailable in land-based venues. The reason why individuals who prefer online gambling are more often problem gamblers than non-Internet gamblers are still not clear. Future research is necessary to understand why individuals who gamble online are more often problem gamblers than offline gamblers and to find out where the differences between these groups lie.

1.7 Poker and online poker

Early in the 21st century poker became very popular, likely because of the emergence of online poker (Rubin & Watson, 2011). Over the last few years popularity and participation of online poker has increased explosively around the globe. Factors which have provoked an increase in online poker could be the growing number of celebrities indulging and playing poker, the increasing media focus on poker games, possibilities to learn poker playing for free online, possibilities to play for low stakes, 24 hours accessibility to play via Internet and the potential to win because there is an element of skill in poker (Wood, Griffiths, & Parke, 2007).

This rise in poker popularity has created more and more professional poker players. This relatively new type of gambler makes a living from playing poker (McCormack & Griffiths, 2012). McCormack & Griffiths (2012) looked into the difference between recreational poker players and professional poker players. Their sample consisted of 9 poker players: three of them were professional poker players, one was a semi- professional poker player and five were recreational poker players. They were aged between 23 and 47 years ($M = 31$ years, $SD = 7,4$ years), eight were male and one female. McCormack & Griffiths (2012) found that professional poker players were more disciplined than recreational poker players, were less likely to indulge in chasing losses and took fewer risks. Professional poker players treated poker as their work and played more logically and in a controlled manner. Furthermore, they were more likely to play multi-table poker online and played longer sessions in order to raise the amount of winnings. Recreational poker players played poker under the influence of alcohol or drugs, took more risks, were more likely to indulge in chasing behaviour and showed signs of lack of control. They also played just one or two games at a time. McCormack & Griffiths (2012) conclusion was that it is possible to play poker for living, but only for a minority of players. To live on playing poker takes dedication, talent, disposition,

patience and discipline. The dream to live on playing poker could be a trap for many gamblers.

In 2004, 3,4 % of the callers to the Swedish National Helpline for Gambling Problems reported their main type of problem gambling as online poker. A year later, Internet poker (22.4 %) was after gaming machines (34.7%) the second most often reported type of problem gambling reported to the Swedish National Helpline for Gambling Problems (Spelinstitutet 2006 in Jonsson & Rönnberg, 2009). In 2006, online poker was introduced by SvenskaSpel, and Sweden is therefore the first country in the world with a state-owned Internet poker website (Binde 2007 in Jonsson & Rönnberg, 2009). Goudriaan, Slutske, Krull & Sher (2009) found in their four year longitudinal study that card gamblers were at higher risk for problem gambling. Wardle et al. (2011) found that individuals playing poker in a pub/club had the highest engagement in gambling activities and gambled on average in 7,6 different games over the past year.

1.7.1 Poker and online poker in student samples

Poker and online poker are also growing in popularity among university students. Ly (2010) found that among 148 Tasmanian online gambling university students, poker was the favourite game played online, with 32% of the sample playing it. Furthermore, in a sample of 1348 students enrolled in different universities in Connecticut, Engwall et. al (2004) observed, that playing cards for money was the most frequent gambling activity among pathological gamblers. Wood, Griffiths, & Parke (2007) surveyed online poker playing in a student sample. They contacted approximately 10 000 students by e-mail asking for online poker players to participate. The assumption that 5% of the U.K. population plays poker online led to the expectation that about 500 students would be online poker players. As 422 students responded the sample was deemed to be representative. 362 of the online poker players were male and 60 female. The students were aged between 18 and 47 years ($M = 21$ years, $SD = 3,4$ years). The survey included the DSM-IV diagnostic criteria for pathological gambling (American Psychiatric Association, 1994). Most of the students (66%) started playing online poker in the past 12 months prior to the survey, and just 18,9% of the students had played online poker for over 18 months. The majority (62%) started to play poker online because of their playing friends, about one fourth (23%) named poker playing on television as the reason for starting to do so and 11,4% started because they got offered a free run through a spam e-mail or a pop-up. More female players (30%) than male players (12%) reported gender swapping. Both genders believed that female players would not be taken seriously. This

assumption led female players to pretend to be male, whereas male players saw an advantage in pretending to be female. Of those online poker players, 18% could be identified as probable pathological gamblers (four or more of the ten DSM-IV criteria for pathological gambling were matched). Another 30% matched two or three criteria of the DSM-IV, which could mean that those students had some gambling problems. Adding both groups together suggests that almost half of the self-selected online poker player sample had some gambling problems. Those findings fit with press reports in the United Kingdom. According to them, a large number of university students' financial problems may be due to online poker play (Wood et al., 2007). Griffiths, Parke, Wood, & Rigby (2010) found that problem online poker players of the student sample taken in 2007 (with a score of four or more on the DSM-IV) were less disciplined and spent more money than they planned. They were also more likely to swap genders when playing, played more frequently and for longer periods of time. Even though there is a small amount of skill involved in poker, skill could not predict problem gambling. On the other hand the financial success of poker players could be predicted by disciplined gambling behaviour (when students did not spend more than their monthly gambling budget), by playing at higher stakes, not over-estimating the skill involved in poker and by perceiving themselves to be more skilful.

Linnet, Gebauer, Shaffer, Mouridsen and Møller (2010) examined the difference between experienced and inexperienced poker players among students of Aarhus university. Poker players had to play poker at least for one year and once a week to be categorised as experienced poker players. Inexperienced poker players had to know the rules of poker but otherwise have no poker playing experience. All in all nine participants could be recruited, five experienced poker players (all male) and four inexperienced poker players (all female). The participants had to take part in 50 poker task trials with no feedback in between. Results showed that experienced poker players were more likely to overestimate probability of winning while inexperienced poker players were more likely to underestimate winning chances. In spite of that, experienced poker players made better decisions than inexperienced poker players. Among the poker players, online poker was preferred over other kinds of poker games. Wood, Griffiths, & Parke (2007) assume that reasons for the high participation of university students in online poker could be due to availability, as students have access and are familiar with the Internet.

1.8 Coping behaviour and gambling

Stress is an unavoidable factor of life. It can be defined as a relationship between the person and the environment that is assessed by the person as overrunning his or her resources and compromising his or her well-being (Bodenmann, 2007). What is considered as stress varies therefore between individuals (Bergevin, Gupta, Derevensky, & Kaufman, 2006). Responses to stress also vary from person to person. Coping strategies account for individual methods to deal with stress (Lazarus & Folkman, 1984). The theory of coping commonly posits three central strategies, which are task-, emotion-, and avoidance- specific behaviours (Endler & Parker, 1990; Parker & Endler, 1992). Individuals who use task- or problem directed coping show the effort to change the circumstance of the stressful occurrence or to look for more information about ways to solve the stressful event. Emotion-based coping on the other hand is the attempt to adjust emotional distress by changing one's perception or interpretation of the stress factor. Therefore, cognitive or behavioural efforts are often used, such as minimization, positive comparison, and configuring positive value from negative situations (Lazarus & Folkman, 1984). Avoidant coping strategies, such as busying oneself in diverting behaviours in order to avoid stress, are usually considered maladaptive. If gambling is used as a distracting activity to avoid stress, after a while, financial problems and time spent gambling can collaborate to cause stress. Hence, it is assumed that using avoidant coping strategies could lead to disordered gambling (Lostutter et al., 2011).

In a Vietnamese research, 880 participants, who were randomly selected out of a bigger study pool, were surveyed with respect to avoiding coping strategies and gambling behaviour. The response rate of the sample was 51,97%. The average age of the participants was 20,1 years (SD = 2,63) and ranged from 16 to 24 years. Of the participants, 53% were female and 47% male. The SOGS (Lesieur & Blume, 1987) was used in order to measure gambling problems. For measuring avoidant coping the Avoidant Coping Subscale (ACS; Patterson & McCubbin, 1987) was adapted to Vietnamese culture (e.g. "ride around in the car" was altered to "ride around on the bike/motorbike" as cars are luxury items in Vietnam). Somewhat more than half of the sample (53%) had gambled in the past six month. As at risk gamblers with a SOGS score of 3 to 4 were 8,5% of the participants classified, while 6,6% had a SOGS score of ≥ 5 and were therefore categorised as probable pathological gamblers. Avoidant coping was significantly higher for probable pathological gamblers compared to the others. On the other hand, differences in avoidant coping between at-risk gamblers, social gamblers and non-

gamblers could not be found. The hypothesis that avoidant gambling is related to problem gambling was approved but with limitations (Lostutter et al., 2011).

1.8.1 Coping behaviour and gambling in student populations

In their survey on college students, Weinstock & Petry (2008) observed that students who were pathological gamblers perceived significantly less social support than non-pathological gamblers. Weinstock & Petry (2008) speculated that these differences between non-pathological and pathological gamblers could be related to the activation of different coping strategies. Recently, Benson, Norman and Griffiths (2012) surveyed an opportunity sample of 109 university students to find out if there is a difference in terms of gambling behaviour between individuals with problem-focused and emotion-focused coping strategies. Their sample consisted of 79% female and 21% male students. The age range of the sample was 18 to 33 years with the mean age of 20,5 years ($SD = 2,29$). In order to evaluate coping styles among the students the Student Coping Scale (SCOPE; Struthers, Perry, & Menec, 2000) was administered. Six items taken from the SOGS (Lesieur & Blume, 1987) were used to measure gambling frequency. Contrary the assumption, no significant difference could be found between students with those two different coping strategies with respect to gambling behaviour (Struthers et al., 2000). In a student sample among 202 participants, Lightsey and Husley (2002) researched whether individuals who use effective coping skills may be less likely to gamble than others. Task- focused coping style was evaluated as useful in maintaining control over behaviours. Such a coping strategy can reduce stress and improve the relationship between the individual and his environment. It was assumed that students who use a task-oriented coping style would be less likely to gamble than students using avoidance or emotion-based coping. The student sample consisted of 51% females and 49% males and had an age range between 17 to 53 years ($M = 24,7$ years). In order to measure gambling problems the SOGS (Lesieur & Blume, 1987) was applied, and to evaluate coping strategies the CISS (Endler & Parker, 1990; Endler, Parker, & Multi-Health Systems, 1999) was selected. Results showed that coping strategies could not predict gambling behaviour among women, whereas for men higher task coping and lower emotional coping strategies were related to less gambling (Lightsey & Hulsey, 2002). Not many studies have been conducted on the relationship between coping strategies and gambling behaviour. Both student samples on the topic introduced above could not confirm their assumptions completely so further research is warranted.

1.9 Attitudes towards gambling and gambling behaviour

Attitudes refer to the extent to which a person has a unfavourable or favourable rating concerning a particular behaviour (Thrasher et al., 2011). Wardle et al. (2011) developed a shortened version of the Attitudes Towards Gambling Scale (ATGS), which includes 8 items out of the 14 items of the longer version (Wardle et al., 2007). In their national survey conducted 2010, Wardle et al. (2011) found that average attitudes towards gambling were in general slightly negative. Additionally, men had on average more positive attitudes towards gambling than women. Attitudes did not diversify by age. Regular gambler and past week gamblers were more positive towards gambling compared to participants who did not gamble the previous year or gambled on an irregular basis, although the overall attitude towards gambling was still negative. When compared to attitudes towards gambling evaluated in the 2007 national survey in Britain (Wardle et al., 2007) it could be observed that they became significantly more positive. This increase applied for both genders. Overall though, the attitudes towards gambling in the British public were rather negative than positive. Most participants saw gambling as more disadvantageous than conductive for both individuals and society. The majority thought that there were too many gambling possibilities these days and that gambling should be discouraged. On the other hand, total prohibition of gambling was rejected by most of the participants (Wardle, et al., 2011). Attitudes towards gambling were significantly related to gambling behaviour. The more gambling activities the individual participated in during the past week or year, the more positive was his attitude towards gambling (Wardle et al., 2007). Furthermore in Britain's national survey 2010, half of the sample received an extra instruction, which defined gambling amongst others as including the National Lottery and bingo. As some participants do not classify such activities as gambling, this extra description produced a small but statistically significant rise in attitude scores compared with those who did not get the extra specification (Wardle, et al., 2011). In an online survey conducted among 6682 Australian gamblers, aged 16 to 100 years ($M = 45$ years, $SD = 15$ years) the Gambling Attitudes Scale (consisting of three items) (Williams 2003 as cited in Williams et al., 2006) was applied. Results showed that Internet gamblers had significantly more positive attitudes towards gambling than non Internet gamblers. In addition Internet gamblers were more likely to gamble 2 to 3 times a week or 4 or more times a week than non- Internet gamblers (Gainsbury et al., 2012). All these examples show that attitudes towards gambling and actual gambling behaviour might be related. It is therefore important to keep track of attitudes towards gambling in populations. Additionally, it would be interesting to see if there is a relationship between attitudes towards gambling and participation in particular types of games.

1.9.1 Attitudes towards gambling in student populations

Attitudes towards gambling were evaluated in a sample among students of the University of Oregon. 1600 e-mails were sent to invite students to an online survey. After the first 450 initiated answers, the survey was closed, with 439 students completing the survey. Of those students, 17% were against gambling for religious and moral reasons. That gambling was about skill was believed by 21% of the sample, whereas 79 % participants disagreed. The majority (62%) of students perceived gambling problems as possible to change through will power but most of the participants (87%) recognised gambling as an addiction. Treatment of problem gambling was perceived as usually successful by 64% of the students (Johnson & McCaslin, 2010). In order to determine attitudes towards gambling among students, Williams, Connolly, Wood & Nowatzki (2006) used the Gambling Attitudes Scale (Williams, 2003 as cited in Williams et al., 2006). Their sample consisted of 585 students with an average age of 21,7 years ($3,7 = SD$). Of those students 61% female were and 39% male. Problem gambling was measured with the CPGI (Ferris & Wynne, 2001). A more positive attitude towards gambling could predict problem gambling (Williams et al., 2006). Consistent with that, Wu, & Tang (2012) found in a Chinese sample of 932 students aged 18 to 25 ($M = 20,64$, $SD = 1,49$) that positive attitudes toward gambling preceded intention to gamble. This in turn was a prominent promoting factor of problem gambling among Chinese college students. Wu, & Tang (2012) used 4 items to measure gambling expectancy and the SOGS (Lesieur & Blume, 1987) to evaluate problem gambling behaviour among the Chinese college student sample. Studies that assess attitudes towards gambling in student samples are rare. But because attitudes might relate to gambling behavior it is important to gain a better understanding of attitude towards gambling and gambling behavior among students.

1.10 Aims of the current study

The following survey is meant to evaluate gambling behavior among Icelandic University students. The main purpose of this research is to gain knowledge about university students' prevalence of problem gambling and participation in land-based and Internet gambling. Participation in poker and online poker is surveyed in particular in order to find out if Icelandic students have been affected by these games popularity. Coping strategies among Icelandic University students are measured and tested for a connection with gambling behaviour. In addition, the study investigates whether there is a relationship between students' attitude towards gambling and their behavior and whether those outcomes are comparable to findings of other surveys.

2 Method

2.1. Participants

An invitation to complete an online questionnaire was sent to 10,207 undergraduate students enrolled in four Icelandic Universities (University of Iceland, Reykjavik University, University of Akureyri and Iceland Academy of the Arts) via e-mail in March 2010. After two weeks, a reminder e-mail was sent. Of all the surveys received ($n = 1749$), those who quit the survey before answering items for background variables, participation in the different kinds of games and the PGSI ($n = 519$) were excluded. Participants who omitted a few of those questions but went on to answer the survey were still accounted for.

A total of 1,230 undergraduate students were evaluated, resulting in a participation rate of 12,05%. Table 3 gives an overview of the students that participate in the survey classified by different universities.

Table 3. Participation of four Icelandic universities

	University of Iceland	Reykjavik University	University of Akureyri	Iceland Academy of the Arts
e-mail invitations sent	5930	2898	1014	365
Initiated answers	889	538	229	93
Valid answers	582	398	189	61
Response rate (initiated answers)	15%	18,6%	22,6%	25,5%
Response rate (valid answers)	9,8%	13,7%	18,2%	16,7%

33% ($n = 408$) of the respondents were male and 67% ($n = 816$) female. The average age of the whole student sample was 29,63 years ($SD = 8,48$). The women's average age was 29,8 years whilst the average age of men was 29,33 years. The lowest average age was found within students of the Iceland Academy of Arts with 26,07 years, participating students of the University of Akureyri were on average 32,11 years old and had therefore the highest average age. As the assumption of homogeneity of variances was tested and found not tenable using Levene's test $F(3, 1220) = 8.09$ $p = 0.000$, the Welch test was used to examine differences in mean age of the students of the four universities (Table 4).

Table 4. Students' mean age of the four Icelandic universities

	University of Iceland (n = 582)	Reykjavik University (n = 398)	University of Akureyri (n = 189)	Iceland Academy of the Arts (n = 61)
Mean age	28,84	30,17	32,11	26,07

The students' mean age differed significantly between universities Welch test $F(3,266) = 15,57$ $p = 0.000$. To analyze the difference further, the Tamhane-T2 method was applied. Students of the University of Akureyri were significantly older than students of the University of Iceland ($p = 0,000$) and Iceland Academy of the Arts ($p = 0,003$). Students of the Iceland Academy of the Arts were additionally significantly younger than students of the Reykjavik University ($p = 0,000$).

Participants were not offered any payment, but three vouchers for the university book store, of 15.000 ISK value, were awarded in a prize draw that included all students who finished the survey.

2.2 Measures

2.2.1 Questionnaire

An online questionnaire was constructed using the program Questionpro. The background variables of gender, age, and relationship status were surveyed. Participation in different Icelandic and foreign online and land-based games twelve months prior to the study was evaluated. For each game a student had participated in, it was asked if it was played daily, three to six times a week, once or twice a week, one to three times per month or a few times in the past 12 months. Icelandic land-based games included in the present study were: Lotto, slot machines, scratch tickets, football betting, sports betting, class lottery, poker, pokercup, cash-poker, bridge and other card games, betting on own sports performance and bingo. Surveyed gambling participation on Icelandic web pages included: Lotto, Lotto subscription, football betting, sports betting, live sports betting and class lottery. The only foreign land-based gambling activity researched was pokercup participation. Participation in games on foreign web pages surveyed included: online slot machines, online scratch tickets, sports betting, online poker and other games (e.g. blackjack, bingo, roulette etc.). Frequency of gambling if played weekly or monthly and whether money was won or lost was also assessed.

Additionally, participants were asked about how much time they spent in each gaming session and in the case of online games, the location from where they played (home, at work,

coffeehouse etc.) and at which time of day. If the participant engaged in gambling on foreign gambling web pages, they were further asked on what particular page they gambled and how they paid for their participation. Poker playing behavior was examined in more detail. The type of poker game, the period the game was played and how much money was bet on each poker game had to be specified. Online poker players answered questions on how many tables they played at the same time and if they ever lied about their gender in online poker games. Additionally poker players were asked why they preferred playing online poker compared to land-based poker or vice versa. These questions were followed by the Problem Gambling Severity Index (CPGI; Ferris & Wynne, 2001), the Attitudes towards Gambling Scale (ATGS; Wardle et al., 2007) and the Coping Inventory for Stressful Situations (Endler & Parker, 1990; Endler et al., 1999). At the end some general questions were asked, for example: “Did you ever gamble while you were drunk or used drugs in the past 12 months?” or “Did you, in the past 12 months, feel much sadness or depression that lasted for at least two weeks?” In total the questionnaire comprised 248 queries. Participants did not have to answer all questions however. If an individual for example, indicated no participation in poker the year prior to the study, the question about the frequency was skipped. Through such jumps it was ensured that individuals did not need to reply to unnecessary questions.

2.2.2 Problem Gambling Severity Index (PGSI)

The PGSI consists of nine items and is a subset of items from the Canadian Problem Gambling Inventory (CPGI) (Ferris & Wynne, 2001). Four items estimate problem gambling behavior (e.g. “How often have you bet more than you could really afford to lose?”) while five items estimate adverse consequences of gambling (e.g. “How often have you felt that you might have a problem with gambling?”). For each question four answer alternatives are given (0 = never, 1 = sometimes, 2 = most of the time, 3 = almost always). The continuum of scores therefore ranges from 0 to 27. A PGSI score ≥ 8 discriminates the “problem gambling” subgroup (Wynne, 2003), whereas a score of 3 – 7 denotes moderate risk gambler, a score of 1 – 2 marks low risk gambler and a PGSI score of 0 identifies non-problem gambler (Stinchfield, Govoni, & Frisch, 2007). For the present survey, individuals with a PGSI score of 3 – 27 were denoted as problematic gamblers while as participants with a PGSI score of 0 – 2 were denoted as non – problematic gamblers.

The Icelandic translation of the PGSI was used, which has satisfactory psychometric properties in this study $\alpha = .84$ (males $\alpha = .88$ and females $\alpha = .56$) coinciding with the original findings (Olason et al., 2003).

2.2.3 Attitudes towards Gambling Scale (ATGS)

The ATGS (Wardle et al., 2007) is composed of 14 items. Those items are statements, which express attitudes towards gambling. Individuals can state how much they agree or disagree with each statement on a five point Likert scale: “strongly agree”, “agree”, “neither agree or disagree” to “disagree” and “strongly disagree”. The ATGS was developed for the 2007 British Gambling Prevalence Survey. The internal reliability was found to be high ($\alpha = 0.88$) (Wardle et al., 2007). The ATGS was for the purpose of this study, translated into Icelandic by two independent translators. Those two versions were almost congruent. The Icelandic version was then translated back into English and compared to the original English version. The consequential English version was concurrent with the original version of the ATGS. The Icelandic version of the ATGS was found to have comparatively psychometric characteristics to the English version (Þorvarðsson, 2012).

2.2.4 Coping Inventory for Stressful Situations (CISS)

The CISS (Endler & Parker, 1990; Endler et al., 1999) is construed to measure coping behaviors when responding to stressful, upsetting or difficult situations. It consists of 48 items and is a self-report assessment with a five point Likert scale, providing answers ranging from “not at all” to “very much”. The CISS has three coping subscales with corresponding items: emotion-oriented “become very upset”, task-oriented “consider similar problems” and avoidance- oriented “buy myself something”. A total of sixteen questions are dedicated to each subscale. The avoidance-orientated scale is then further subdivided into distraction or social diversion. For the present survey the Icelandic translation of the CISS was used, which has strong internal consistency (coefficient alphas for task, emotion, and avoidance subscales were .92, .89, and .87) (Rafnsson, Smari, Windle, Mears, & Endler, 2006).

2.3 Procedure

To conduct this study, permission from the Icelandic Data Protection Commission was obtained. In spring 2010 all 10207 undergraduate students of four Icelandic Universities received an invitation for the online questionnaire via e-mail. The e-mail comprised an introduction from the researchers and a hyperlink which led participants to the online questionnaire. Participants were briefed that they could abort or reject participation at any time. Furthermore they were affirmed that their answers would be in confidence. Should participants have questions they were asked to contact the researchers in charge of the project. A link to a website with information about problem gambling and help in case of such problems was added. It took 15-20 minutes to complete the survey. No payment was offered,

but in order to enhance the participation, participants who completed the survey could win a voucher for the university book store. Two weeks after the first e-mail a reminder to participate in the research was sent.

2.3.1 Statistical analyses

If a student did not answer all of the nine PGSI items, his total PGSI score was excluded. The same *modus operandi* was applied to the fourteen ATGS items. If all items were not answered the total ATGS score was disregarded. Furthermore, if a student failed to answer more than two questions of the 48 CISS items, his CISS data was excluded. On the other hand if a participant missed two items, the mean value of such an item was calculated and used.

Because so few students were widowed or divorced, those two groups were combined into one denoted as “divorced/widowed”.

Furthermore, two groups of the PGSI, “moderate risk gambler” with a PGSI score of 3 to 7 and the group “problem gambler” with a PGSI score of 8 and more were combined into the group “problematic gambling”. Participants were therefore scaled into “non-problem gambling” with a PGSI score of 0, “low level of gambling problems” with a PGSI score of 1-2 or “problematic gambling” with a PGSI score of 3 or more.

Gambling frequency was separated into two groups. Students who were denoted as monthly gamblers played either “few times a year” or “1 to 3 times per month”, participants were identified as weekly gamblers if they played either “3 to 6 times a week” or “1-2 times a week”.

To test if there are significant differences between two groups with nominal scaled data, χ^2 was used. The data (CISS values, ATGS scores and number of different games participated in) were tested for normal distribution. Although the histograms looked promising according to the Shapiro-Wilk test, only avoidant coping style was normally distributed. The attempt to use logarithm in order to get a normal distribution failed. Therefore the Mann-Whitney U test was used instead of the t- test to see if there was a difference in data ranking. The one-way Anova was used according to the central limit theorem (CLT) (Bortz, 1999). As ATGS scores had variance heterogeneity in combination with age group, relationship status and problem gambling (according to the Levene’s test and the non-parametric Levene’s test) the Kruskal-Wallis test was used to compare the differences between groups. Linear regression analyses were carried out concerning different independent variables in terms of attitudes towards gambling and gambling severity. The residua of the PGSI scores were not normal distributed, hence a binary logistic regression was performed. Students with a PGSI scores of 0 to 2 were

therefore grouped as “non - problematic gamblers” and students with PGSI scores of 3 to 27 were grouped as “problematic gamblers”. The data was analysed with the Statistical Package of Social Science (SPSS).

3 Results

3.1 Gambling participation

Of the 1,230 Icelandic students, 266 (21,6%) did not gamble at all in the past 12 months, while 964 (78,4%) indulged in at least one game in the past year. Most students of these 964 gambled a few times a year (48,5%) whereas 0,3% (n = 4) of them gambled daily. Numerous students (37,7%) have gambled on the Internet at least once in the past year. Most of them used Icelandic webpages to do so (see table 5).

Table 5. Overall gambling participation

	Weekly %	Monthly %	At least once in the past year %
All games	14	63,2	78,4
Games on the Internet	12,2	20,4	37,7
Games on Icelandic webpages	11,1	18,3	34,7
Games on foreign webpages	1,5	4,0	5,5

The relatively high percentage of students gambling on Icelandic webpages could be explained by the fact that Lotto subscriptions have to be purchased on Icelandic webpages.

3.1.1 Gambling participation and background variables

The variables gender, age and relationship status were significantly related to gambling participation. Men gambled more than women; participants aged between 36 and 45 were most likely to gamble at least once a year; and divorced and widowed individuals were more likely to gamble compared to participants with other relationship status (see table 6).

Table 6. Demographic variables and gambling participation

	Number	Weekly %	Monthly %	At least once in the past year %	χ^2
Gender					7,24*
Male	408	17,9	65,4	84,3	
Female	816	12	62	75,4	
Age-group					29,03***
18 – 25	504	8,1	66,7	74,2	
26 – 35	454	16,3	64,1	80,4	
36 – 45	167	21	63,5	87,4	
46 – 75	90	22,2	46,7	75,6	
Relationship Status					21,86***
Single	460	11,1	61,3	73,9	
living together	499	12,4	68,7	81,2	
Married	233	22,3	54,1	79,8	
divorced/widowed	35	20	65,7	87,6	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0,001$

3.1.2 Gambling participation in different types of games

The average student played two to three different types of games. Some students did not play any games and others played 15 different kinds of games (of the 22 possible games the individual could have played). Most of the participants who gamble played two games (21,1%). However, about 6% of the sample indulged in 6 or more different games.

The most popular game in this student sample was Lotto. Almost 60% of the participants have played Lotto at least once in the past 12 months (see Table 7). The Lotto ticket was most commonly purchased in a shop rather than online. The second most popular gambling variant was scratch tickets, followed by playing poker, bingo and slot machines. It is interesting that most of the participants who played card games for money did so at poker games. Very few students bet on live sports events online or played card games (other than poker) for money during the past year.

Table 7. Participation in different types of gambling in Iceland

Type of game	Number	At least once in the past year %	Monthly %	Weekly %
Lotto played at shops	690	56,1	52,9	3,2
Lotto played on the Internet	332	27	24,1	0,7
Lotto subscription on the Internet	132	10,7	-	10,7
Slot machines	211	17,2	17	0,4
Scratch tickets	380	30,9	29,2	0,2
Football betting at shops	59	4,8	4,8	0
Football betting on the Internet	43	3,5	3,5	0
Sports betting at shops	43	3,6	0,1	0
Sports betting on the Internet	34	2,8	2,8	0,2
Live sports betting on the Internet	9	0,7	0,7	0
Class Lottery (HHÍ, DAS, SÍBS)	185	15	15	0
Poker	241	19,6	19,6	0,3
Bridge and other card games	7	0,6	0,6	0
Betting on own sport performance	56	4,6	4,6	0,1
Bingo	230	18,7	18,5	0,1

Lotto was the game most often played on a weekly basis. This might also be explained by the fact that participants with a Lotto subscription gambled weekly. Poker was the second most often played game on weekly basis, followed by slot machine gambling. Sometimes, students did not answer the “yes” or “no” question if they had participated in a specific game, but answered later that they played this game on weekly basis. This explains a higher percentage, in some cases, for weekly and monthly gambling participation when added together, compared to the percentage of “participated at least once in the past year”.

3.2 Online gambling

3.2.1 Online gambling and background variables

Interestingly, as for gambling in general, men were significantly more likely to gamble online than women. Divorced and widowed participants were significantly more often involved in online gambling, and individuals between 36 and 45 years of age were more likely to gamble online than individuals in other age groups (Table 8).

Table 8. Demographic variables and online gambling participation

	Number	Weekly %	Monthly %	At least once in the past year %	χ^2
Gender					16,02***
Male	408	14,7	27	44,4	
Female	816	10,9	17,2	34,2	
Age-group					30,46***
18 - 25	504	6,4	19,3	28,8	
26 - 35	454	14,8	22	41,2	
36 - 45	167	19,2	24	54,5	
46 - 75	90	20	15,6	43,3	
Relationship Status					18,23***
single	460	8,7	19,4	23,7	
living together	499	11,4	21,6	27,5	
married	233	19,7	19,7	45,5	
divorced/widowed	35	20	22,9	60	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0,001$

Table 9 shows how many and who gambled online on Icelandic webpages. Table 10 gives an overview of how many and who gambled on foreign webpages.

Table 9. Demographic variables and online gambling on Icelandic webpages

	Number	Weekly %	Monthly %	At least once in the past year %	χ^2
Gender					5,84*
Male	408	11,8	22,2	37,3	
Female	816	10,8	16,2	33,2	
Age-group					41,63***
18 - 25	504	4,6	16,7	24,6	
26 - 35	454	14,1	18,9	37,7	
36 - 45	167	18,6	24	54,5	
46 - 75	90	20	15,6	43,3	
Relationship Status					27,26***
single	460	6,7	61,7	27,2	
living together	499	10,6	19,2	35,7	
married	233	19,7	18,5	44,2	
divorced/widowed	35	20	22,9	60	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0,001$

Men gambled significantly more often than women. Furthermore, the majority of individuals who gambled on foreign webpages were male. Significant differences between age groups could be found in overall online gambling participation and on Icelandic webpages. In both cases students aged 18 to 25 were less likely to gamble than other groups

Table 10. Demographic variables and online gambling on foreign webpages

	Number	Weekly %	Monthly %	At least once in the past year %	χ^2
Gender					77,43***
Male	408	4,2	9,6	13,7	
Female	816	0,1	1,2	1,2	
Age-group					14,18 ^a
18 - 25	504	2,6	4,4	6,7	
26 - 35	454	1,8	5,5	6,4	
36 - 45	167	0,6	1,2	1,8	
46 - 75	90	0	0	0	
Relationship Status					12,24 ^a
single	460	2,4	4,8	7,2	
living together	499	1,4	4,6	5,8	
married	233	0	1,7	1,7	
divorced/widowed	35	0	0	0	

*p ≤ 0.05; **p ≤ 0.01; *** p ≤ 0,001 ^a Predicted value of cells in the table did not fulfil requirements for the significance test.

3.2.2 Gambling participation in different types of online games on foreign web pages

The most popular online game played on foreign webpages was poker. As table 11 shows, almost 4 % of the student sample played online poker in the past year. Betting on sport events online or playing slot machines online were the second most popular online game variants gambled on foreign webpages. Online scratch tickets were only played by a single person out of the sample whereas online games like Black Jack and Roulette were played by 11 students.

Table 11. Participation in different types of gambling on foreign webpages

Type of game	Number	Weekly %	Monthly %	At least once in the past year %
Online Poker	46	1	2,8	3,7
Online Scratch tickets	1	0	0,1	0,1
Online slot mashines	18	0	1,5	1,5
Online sports betting	19	0,5	1,1	1,5
Online games (Black Jack, Roulette, etc.)	11	0	0,9	0,9

3.2.3 Gambling participation in online games versus land-based gambling

In the following table 12, the average number of different games individuals participated in of participants who gamble solely on land-based venues and individuals who gamble both land-based and online were calculated separately. The Mann-Whitney U test showed that individuals who gambled online and on land-based venues participated significantly in more diverse games than individuals who played exclusively on land-based venues.

Table 12. Number of different games participated in land-based vs. online and land-based gambling

		Median	Mean	Mann-Whitney U test
Number of different games participated in	land-based gambling	2	2	0,000***
	online and land-based gambling	3	4	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

3.3 Problem gambling

Most of the students were non-problem gamblers, but 6,3% of the sample also had low level problems and 2,3% had either a moderate level of problems or were problem gamblers. Table 13 gives an overview of PGSI scores of the student sample.

Table 13. PGSI Scores for the whole sample

Score		%	n
-	Non gamblers	20,6	253
0	Non-problem gambler	74,2	913
1 to 2	Low risk gambler	6,3	77
3 to 7	Moderate risk gambler	1,9	23
8+	Problem gambler	0,4	5

3.3.1 Problem gambling and background variables

Women were significantly more likely to be non-problem gamblers than men. Additionally, men were significantly more likely to be in any other of the PGSI categories for problem gambling. Age had no significant relation to problem gambling nor did relationship status (Table 14).

Table 14. Demographic variables and PGSI Scores

	Number	Non-problem gambling (0) %	Low level of gambling problems (1 – 2) %	Problematic gambling (3+) %	χ^2
Gender					48,7***
Male	408	68,1	11,3	4,9	13,45 ^a
Female	816	77,2	3,8	0,7	
Age-group					13,03 ^a
18 – 25	504	70,6	8,1	2,6	
26 – 35	454	75,1	6,2	2	
36 – 45	167	77,8	3,6	0,6	
46 – 75	90	80	2,2	3,3	
Relationship Status					13,03 ^a
Single	460	71,3	7,4	2,8	
living together	499	73,3	7	1,8	
Married	233	82	3	0,9	
divorced/widowed	35	74,3	2,9	5,7	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$ ^aPredicted value of cells in the table did not fulfil requirements for the significance test.

3.3.2 Problem gambling: online versus land-based gambling

In order to compare land-based and online gambling, three groups of participants were formed (see table 15). All students who gambled exclusively online were grouped together, all students who only gambled on land-based facilities were in another group and students who gambled both online and land-based were arranged in a third group. Students who only gambled online were rare. Of those students ($n = 14$) only one had moderate gambling problems whereas all the others had a PGSI score of 0. The two groups of students who either gambled solely land-based ($n = 495$) and students who gambled online as well as land-based ($n = 442$) were therefore compared. The Chi square test ($\chi^2 = 12,18$, $p = 0,002$) showed that those two groups differ significantly from each other. Students who gambled online as well as on land-based venues were more likely to have a low level of gambling problems or be problematic gamblers than students who play just on land-based facilities.

Table 15. Online versus land-based gambling and PGSI Scores

	Number	Non-problem gambling (0) %	Low level of gambling problems (1 – 2) %	Problematic gambling (3+) %
Type of gambling				
Land-based gambling	495 (40,2%)	75,6	6,1	1,4
Online gamblers that also play Land-based games	442 (35,9%)	70,8	10,4	4,1

3.3.3 Participation in different types of gambling and problematic gambling

As the residua of the PGSI scores were not normal distributed, a binary logistic regression was performed with participation in all 22 different types of games as independent variables and gambling behavior as dependent variable ($\chi^2 = 42,045$, $p = 0,006$). For that purpose were students with PGSI scores of 0 – 2 were summarised as non - problematic gamblers ($= 0$) and students with PGSI scores of 3 – 27 as problematic gamblers ($= 1$). It could be observed that participation in cash-poker (Exp (B) = 4,062, Wald = 6,874, $p = 0,009$), sports betting on foreign websides (Exp (B) = 4,287, Wald = 6,584, $p = 0,010$) and buying scratch tickets at shops (Exp (B) = 0,628, Wald = 6,162, $p = 0,013$) were significantly related to problematic gambling. Participants in cash- poker had therefore 4,287 times greater likelihood of having gambling problems controlling for participation in the other gambling activity.

When sex was entered as a separate model (step one) ($\chi^2 = 0,436$, $p = 0,509$) and participation in the 22 different types of games in a second model (step two) ($\chi^2 = 42,729$, $p = 0,005$), the effect was still present, while gender and being a problematic gambler or not had no significant relation.

When participation in online gambling, land-based gambling and poker were independent variables and problematic gambling the dependent variable ($\chi^2 = 3,508$, $p = 0,320$), the whole model was not significant, furthermore none of the independent variables had a significant relation to problematic gambling. When gender was entered in a separate model (step one) ($\chi^2 = 0,436$, $p = 0,505$) and participation in online gambling, land-based gambling and poker in a second model (step two) ($\chi^2 = 3,342$, $p = 0,342$) a significant relation between independent variables and the dependent variable also could not be found.

3.4 Poker

Poker was mostly played with friends, family and workmates, followed by online poker and poker competitions (table 16). Most students who played poker did so on a monthly basis. The least popular was participating in online poker competitions.

Table 16. Participation in different types of poker

Type of game	Number	Weekly %	Monthly %	At least once in the past year %
Poker with friends, family and workmates	241	0,3	19,3	19,6
Pokercup	43	0,1	3,4	3,5
Cash-poker	28	0,1	2	2,3
Online poker	46	1	2,8	3,7
Internet Pokercup	25	0,5	1,5	2

3.4.1 Poker playing and background variables

In all varieties of poker games, men were significantly more likely to play than women. Age was not significantly related to participation, except in the case of cash-poker where students aged 18 to 25 years were the most likely to play. Relationship status was significant for students who lived with their partner and were shown most likely to play pokercup or to play poker with friends and family.

Table 17. Demographic variables an poker participation

	Pokercup %	Cash-poker %	Poker %	Online Poker %	Online Pokercup %
Gender	***	***	***	***	***
Male	9,3	6,6	42,9	10,1	5,9
Female	0,6	0,1	8	0,6	0,1
Age-group	**		***	**	*
18 - 25	5,8	3,2	25,2	5,4	3,4
26 - 35	2,6	2,2	21,4	4	1,5
36 - 45	0,4	1,2	9,6	0,6	0,1
46 - 75	0	0	0	0	0
Relationship Status	**		***		
Single	3,3	3	21,7	5	3
living together	5,2	2,4	24,1	4	2
married	0,9	0,9	7,7	1,3	0,4
divorced/widowed	0	0	8,8	0	0

* $p \leq 0,05$; ** $p \leq 0,01$; *** $p \leq 0,001$

3.4.2 PGSI scores compared between poker players and other players

Individuals who play poker were compared to others who play different gambling games. Therefore all students that were poker players and played either poker with family and friends or participated in pokercups, played cash poker or online poker were grouped together. This group was then compared to all the other students who gambled all the other games except poker. The Chi square test showed that students who played poker (n = 253) compared to students who played other games (n = 711) differ significantly from each other (see Table 18). Poker players were more likely to have a low level of gambling problems and were problematic gamblers than gamblers who participated in other games.

Table 18. PGSI Scores and Poker participation versus participation in other games

	Number	Non-problem gambling (0) %	Low level of gambling problems (1 – 2) %	Problematic gambling (3+) %	χ^2
Poker	253	60,1	18,6	6,3	73,88***
Other games	711	77,9	4,1	1,4	

*p ≤ 0.05; **p ≤ 0.01; *** p ≤ 0,001

3.5 Coping

3.5.1 CISS scores and background variables

Female students had significantly higher scores for all coping strategies than men (Table 19).

Table 19. Coping styles and gender

Coping style	Gender	Mean	St.D.	T	Mann-Whitney U test
Avoid	Male	39,9	7,8	9,29***	
	Female	44,5	7,3		
Task	Male	53,6	10		0,000***
	Female	56,2	9,1		
Emo	Male	35,5	9,4		0,000***
	Female	40,2	9,6		

*p ≤ 0.05; **p ≤ 0.01; *** p ≤ 0,001

Younger students aged 18 to 25 were significantly more likely to have avoidant coping strategies than older students $F(3, 1022) = 18, p = 0,000$. While task oriented coping style was not significantly different between age groups, emotional based coping style was more common among younger students, aged 18 to 35 $F(3, 1023) = 5,11, p = 0,002$.

Student coping strategies differed between unequal groups of relationship statuses. Avoidant coping strategies were highest among singles $F(3, 1033) = 9,49, p = 0,000$. Task oriented coping strategies were most used among married students and those living in a relationship $F($

3, 1034) = 8,12, $p = 0,000$, whereas divorced or widowed individuals were most likely to use emotional based coping strategies $F(3, 1034) = 6,53$, $p = 0,000$.

3.5.2 CISS scores and problem gambling

Different coping styles were not significantly related to gambling problems (Table 20). Distinctions between averages of coping scores were not notably high, nor were standard deviations.

Table 20. Coping style and PGSI scores

Coping style	PGSI scores	Mean	St.D.	F
Avoid	Non problem gambling (0)	42,9	7,9	0,61
	Low level of gambling (1-2)	43,9	7,8	
	Problematic gambling (3+)	42,7	8,6	
Task	Non problem gambling (0)	55,5	9,3	0,89
	Low level of gambling (1-2)	54,5	9,4	
	Problematic gambling (3+)	53,6	13,5	
Emo	Non problem gambling (0)	38,4	9,7	0,43
	Low level of gambling (1-2)	39,3	9,6	
	Problematic gambling (3+)	37,4	10,4	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0,001$

3.5.3 CISS scores and gambling participation

Gambling frequency was not significantly related to a specific coping style. Differences in the mean scores of the different coping styles were very small. The mean scores of task oriented coping strategies were the highest for both weekly and monthly gamblers (Table 21).

Table 21. Coping style and gambling frequency

Coping style	Gambling frequency	Mean	St.D.	T	Mann-Whitney U test
Avoid	weekly	42,3	8	1	0,321
	monthly	43	7,8		
Task	weekly	54,5	9,8		
	monthly	55,2	9,2		
Emo	weekly	38,4	9,6		0,800
	monthly	38,8	10,2		

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0,001$

3.6 Attitudes towards gambling

3.6.1 Reliability and Factor analysis of the Attitude towards Gambling Scale (ATGS)

The internal consistency was excellent. The fourteen items of the ATGS were found to have a Cronbach's alpha value of 0.904. The intercorrelations between items were all positive ranging from 0,197 to 0,651. All fourteen items show corrected item- total correlation values between .4 and .695 which means that every item is consistent with the total scale.

The Kaiser-Meyer-Olkin Measure of sampling adequacy (KMO) had a value of .931 and therefore the data was adequate to conduct a factor analysis. All items load over 0.4 on one factor, therefore it can be assumed that all items measure attitudes towards gambling (Appendix D).

3.6.2 ATGS scores and background variables

The mean ATGS score for the whole sample was 36,29. In the following table ATGS average scores of males and females were calculated separately. The Mann-Whitney U test showed that males had significantly higher scores on the attitudes towards gambling scale than females (Table 22).

Table 22. ATGS scores and Gender

	Gender	Mean	St.D	Mann-Whitney U test
ATGS scores	Male	41,4	10,7	0,000***
	Female	33,8	8,8	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Whether or not there was a difference between age groups was tested with the Kruskal-Wallis Test. The data showed that there is a highly significant ($p \leq 0,001$) difference between the mean ranks of the age groups (Table 23). Furthermore, 5,06% of the variability in rank scores could be accounted for by age group. All groups differed significantly between each other. The biggest difference in mean ranks of ATGS scores could be observed between the age groups 18-25 and 46-75 ($p \leq 0,001$) where 7,27% of the variability in rank scores could be accounted for by age. The difference in mean ranks of ATGS scores between the age groups 26-35 and 46-75 was also highly significant ($p \leq 0,001$) where 5,4% of the variability in rank scores could be accounted for by age. The smallest difference between mean ranks of ATGS scores ($p \leq 0,05$) could be found between the age groups 18-25 and 26-35.

Table 23. ATGS scores and Age

	Age	Median	Mean rank
ATGS scores	18-25	38	537
	26-35	36	499
	36-45	33	403
	46-75	29,5	320

Whether or not there was a difference between relationship statuses was tested with the Kruskal-Wallis Test. The data showed that there is a highly significant ($p \leq 0,001$) difference between the mean ranks of relationship statuses (Table 24). Furthermore, 4,05% of the variability in rank scores could be accounted for by relationship statuses. Not all groups differed significantly between each other though. No significant difference could be found between married participants and individuals who were widowed or divorced related to ATGS scores. Singles did not differ from individuals who lived together with their partner in terms of ATGS scores neither. The biggest difference in mean ranks of ATGS scores could be observed between married individuals and singles ($p \leq 0,001$) where 6,08% of the variability in rank scores could be accounted for by relationship statuses. The difference in mean ranks of ATGS scores between married individuals and participants who lived with their partner was also highly significant ($p \leq 0,001$) where 3,73% of the variability in rank scores could be accounted for by relationship status. The smallest difference between mean ranks of ATGS scores ($p \leq 0,05$) could be found between individuals living together with their partner and those who were widowed or divorced.

Table 24. ATGS scores and relationship status

	Relationship status	Median	Mean rank
ATGS scores	Married	33	391
	Living together	37	507
	Single	38	540
	Divorced/Widowed	31	381

3.6.3 ATGS scores and problem gambling

Whether or not there was a difference between problem gambling severity in terms of attitudes towards gambling was tested with the Kruskal-Wallis Test. The data showed that there is a highly significant ($p \leq 0,001$) difference between the mean ranks of different gambling severity (Table 25). Furthermore, 5,35% of the variability in rank scores could be accounted for by gambling severity. Not all groups differed significantly between each other. No significant difference between low-level problem gamblers and problematic gamblers

related to ATGS scores could be found. The biggest difference in mean ranks of ATGS scores could be observed between non-problem gamblers and low-level problem gamblers ($p \leq 0,001$) where 5,03% of the variability in rank scores could be accounted for by gambling severity. The difference in mean ranks of ATGS scores between non-problem gamblers and problematic gamblers was also highly significant ($p \leq 0,001$) where 1,71% of the variability in rank scores could be accounted for by gambling severity.

Table 25. ATGS scores and PGSI scores

	PGSI scores	Median	Mean rank
ATGS scores	Non problem gambling (0)	37	175
	Low level gambling (1-2)	44,5	243
	Problematic gambling (3+)	46	259

* $p \leq 0,05$; ** $p \leq 0,01$; *** $p \leq 0,001$

3.6.4 ATGS scores and gambling participation

The difference between weekly and monthly gamblers in terms of attitudes towards gambling was significant. Individuals who gambled weekly were more positive towards gambling than participants who gambled monthly (Table 26).

Table 26. ATGS scores and frequency

	Gambling frequency	Mean	St.D	Mann-Whitney U test
ATGS scores	Weekly	39,2	10	0,008*
	Monthly	36,9	10,2	

* $p \leq 0,05$; ** $p \leq 0,01$; *** $p \leq 0,001$

3.6.5 Participation in different types of gambling and ATGS scores

When a multiple linear regression was performed with participation in all 22 different types of games as independent variables and ATGS scores as dependent variable $F(22, 965) = 13,78$, $p = 0,000$ it could be observed that participation in some games was significantly related to a higher ATGS score. Participation in poker games with friends, family and workmates had the positive unstandardized beta coefficient of $\beta = 7,056$ ($t = 8,44$, $p = 0,000$), playing on slot machines $\beta = 3,248$ ($t = 3,91$, $p = 0,000$) and participation in poker competitions $\beta = 4,819$ ($t = 2,59$, $p = 0,010$). Football betting at shops ($\beta = 4,430$, $t = 2,4$, $p = 0,02$) and having a Lotto subscription ($\beta = 2,093$, $t = 2,19$, $p = 0,03$) was also related to a higher ATGS scores. When sex was entered as a separate model (step one) ($F(1, 983) = 139,39$ $p = 0,000$) and participation in the different 22 types of games in a second model (step two) ($F(23, 961) = 14,62$, $p = 0,000$), the effect was lessened but still present. At the same significance level as before, participation in poker games with friends, family and workmates had the positive unstandardized beta coefficient of $\beta = 5,827$ ($t = 6,740$, $p = 0,000$). Gambling on slot

machines now had an unstandardized beta coefficient of $\beta = 2,356$ ($t = 2,806$, $p = 0,005$) and participation on poker competitions $\beta = 4,657$ ($t = 2,536$, $p = 0,011$). Having a Lotto subscription ($\beta = 2,226$, $t = 2,350$, $p = 0,019$) and football betting at shops ($\beta = 4,367$, $t = 2,336$, $p = 0,02$) was also still related to higher ATGS scores.

When participation in online gambling, land-based gambling and poker were independent variables and ATGS scores the dependent variable $F(3, 984) = 68,29$, $p = 0,000$, just playing poker had a highly significant positive unstandardized beta coefficient of $\beta = 9,606$ ($t = 12,59$, $p = 0,000$) followed by gambling online with a positive unstandardized beta coefficient of $\beta = 1,637$ ($t = 2,557$, $p = 0,011$). This effect was diminished when gender was entered in a separate model (step one) ($F(1, 983) = 139,39$, $p = 0,000$) and participation in online gambling, land-based gambling and poker in a second model (step two) ($F(4, 980) = 64,62$, $p = 0,000$). Participation in poker games had the unstandardized beta coefficient of $\beta = 7,207$ ($t = 8,682$, $p = 0,001$) while gambling online had the unstandardized beta coefficient of $\beta = 1,452$ ($t = 2,311$, $p = 0,02$).

4 Discussion

The main aim of this research project was to collect information about gambling behavior of university students in Iceland. Participation in different kinds of gambling, problem gambling, coping strategies and attitudes towards gambling were evaluated. In order to gather data, online questionnaires were sent to all undergraduate students of four different Icelandic universities. Of all 10207 students who received such an e-mail invitation, 17,14% (n =1749) responded. After excluding students who did not finish the survey, a total of 1230 (12,05%) were surveyed. Due to this relatively low participation rate, conclusions drawn from the sample to the Icelandic student population has to be done with caution.

4.1 Gambling participation and demographics

Of all the 1230 students who answered the survey more than three-quarter (78,4%) gambled at least once in the past twelve months. Half of the Icelandic students (37,7%) had gambled online at least once in the previous year. Lotto (56,1%), scratch tickets (30,9%) and poker (19,6%) were the most popular games. As in other surveyes, men were more likely to gamble and have problems with gambling than woman (Browne & Brown, 1994; Olason et al., 2003; Stuhldreher et al., 2007). Interestingly, singles were least likely to gamble. Divorced or widowed individuals gambled the most, followed by students who lived together with a partner and married participants. These findings are not in agreement with earlier findings which found singles most likely to gamble (Olason et al., 2003). Students aged between 36 and 45 gambled the most, at least once a year, followed by individuals aged 26 to 35. Participants aged from 46 to 75 were most often gambling on a weekly basis, followed by students aged 36 to 45. The youngest age group, ranging from 18 to 25 years of age, was the most likely to gamble on monthly basis.

4.2 Problem gambling prevalence

Of the student sample, 0,4% had a PGSI score of eight or more, which connoted that those students (n=5) had gambling problems with negative consequences and possible loss of control. Those findings are comparable to another student sample conducted in Iceland, which found a prevalence rate of 0,3% of a PGSI score of eight or more (Olason et al., 2003). The prevalence rate for students who had a moderate level of problem gambling (PGSI scores of 3 to 7) was 1,9% which exactly replicates an earlier finding of moderate level of problem gambling among Icelandic students (Olason et al., 2003). Compared to Icelandic adult samples which were found to have prevalence rates between 0,3% - 0,8% for PGSI scores of eight or more, the student sample was within those numbers. Moderate levels of problem

gambling was smaller in the Icelandic adult samples (1,1% - 1,7%) than in our student sample (Ólason, 2008, 2012; Olason, Barudottir, et al., 2006). The prevalence rate of problematic gambling (PGSI scores of 3 or more) was 2,3%, which can be compared to 2,2% problematic gambling in an earlier student sample (Olason et al., 2003). The prevalence rates of problematic gambling of 1,6% was lower in two adult samples conducted in 2008 (Ólason) and 2006 (Olason, Barudottir, et al.), but higher in (2,5%) in an adult sample conducted 2001 (Ólason, 2012).

When compared to foreign student samples which evaluated lifetime gambling the found problem gambling prevalence rates in this Icelandic sample was rather low (Engwall et al., 2004; Weinstock & Petry, 2008; Wu & Tang, 2012). Also when compared to the Canadian student sample in 2006 (Williams et al.), where the PGSI was administered and current gambling prevalence was evaluated, the gambling prevalence found in the Icelandic sample is smaller, as 6,2% of the Canadian students were moderate risk gamblers and 1,4% problem gamblers. In a survey among U.S. college student-athletes where gambling in the past year was evaluated 2,82%, students were problem and pathological gamblers (Huang et al., 2007), which in turn is also more than was found in the Icelandic sample.

This comparatively low current prevalence of problematic gambling among Icelandic students might be linked to the relatively high average age (29,63 years) of participants. Students in the Canadian sample were on average 21,7 years old (Williams et al., 2006) and just 10,8% of the U.S. college student-athletes were 22 years or older (Huang et al., 2007). Also in the student samples where lifetime gambling prevalence was analysed, the mean age of the samples was lower than in the Icelandic one (Engwall et al., 2004; Weinstock & Petry, 2008; Wu & Tang, 2012).

4.3 Online gambling and poker play

Icelandic University students were more likely to gamble on Icelandic webpages than foreign webpages. Students who gambled on the Internet in general and on Icelandic webpages were likely to be male, between 36 and 45 years old and married. Students who gambled on foreign webpages on the other hand, were likely to be male, single and between 18 and 35 years old. That male students are more likely to gamble online was also found in other studies surveys (e.g. Griffiths & Barnes, 2008; Ly, 2010; Yani-de-Soriano et al., 2012).

Ly (2010) found in a Tasmanian student sample, that being both a regular online and venue gambler was a risk factor for problem gambling. According to the CPGI (Ferris & Wynne, 2001) 37% of those students who gambled online and on land-based venues were moderate risk gamblers (19,1%) or problem gamblers (17,9%). Of those students who just gambled online 25% were either moderate risk gamblers (15,5%) or problem gamblers (10,8%). Those findings could be replicated in the Icelandic sample. Of those students who gambled solely on land-based venues, 6,1% had low levels of gambling problems, while as 1,4% were problematic gamblers. Of students who gambled online and also participated in land-based games, 10,4% had low levels of gambling problems, while 4,1% were problematic gamblers. Students who gambled both, online and on terrestrial venues were therefore significantly more likely to have a gambling problem compared to students who gambled just on land-based venues. Additionally, individuals who gambled both online and offline participated in significantly more different games ($M = 4$) than individuals who gambled solely on land-based venues ($M = 2$).

Consistent with findings of Ly (2010) where poker (35%) was the students' favourite online game, followed by sports wagering (28%) and lotteries (7%), the game Icelandic students favoured on foreign webpages was online poker, with 3,7% students of the sample participating. Online slot machines and online sport betting were the second favourite gambling activity each with 1.5% of the students participating. Students who played poker were significantly more likely to be both low level problem gamblers (18,6%) and problematic gamblers (6,3%), than students who played other games (4,1% low level problem gamblers and 1,4% problematic gamblers). This is consistent with the findings of Engwall (2004) who found that students with a SOGS score of 5 or more preferred to play cards for money and Goudriaan et al. (2009) who observed that students' playing cards were at higher risk for problem gambling.

Male students of the Icelandic sample were more likely to participate in all varieties of poker games (pokercup, cash-poker, poker, online poker and online pokercup) than female students. Frequency of online poker playing was not significantly related to a higher PGSI score (compared were the three categories of low level gambling, moderate level of gambling and possible loss of control). On the other hand participation in cash-poker was in particular related to higher PGSI scores, also when gender was controlled. Moreover, even when controlled for gender, individuals who participated in poker games had also significantly more

positive attitudes towards gambling. In particular individuals who played poker with friends, family and workmates and participants of poker competitions had more positive attitudes towards gambling.

4.4 Coping strategies and gambling

Avoidant coping strategies, such as busying oneself in diverting behaviours in order to avoid stress, are considered maladaptive. Since gambling can be used as a distracting activity to avoid stress, while adding financial problems and time spent to cause stress, it is assumed that using avoidant coping strategies could be related to disorderd gambling (Lostutter et al., 2011).Lostutter et al. (2011) found in their sample on Vietnamese participants that avoidant coping was significantly higher for probable pathological gamblers than others. Two student samples which evaluated coping behaviour could not replicate such findings. Struthers et al. (2000), failed to find a significant difference between problem-focused and emotion-focused coping strategies with respect to gambling. Furthermore in another study, the assumption that students who use a task oriented coping style would be less likely to gamble than students using avoidance or emotion based coping could not be confirmed among women, but higher coping and lower emotional coping strategies were related to less gambling among men (Lightsey & Hulsey, 2002).

The assumption that avoiding coping strategies would be associated with gambling participation or gambling problems was not supported in the Icelandic student sample. In fact, none of the three coping strategies were significantly related to either gambling frequency or problem gambling.

4.5 Attitudes towards gambling and gambling behaviour

The maximum total ATGS score that can be achieved is 70. The score of 42 on the ATGS would implies a neutral view towards gambling (Wardle et al., 2007). The mean of the whole sample was 36,29 and indicated an overall negative attitude towards gambling which agrees with findings of an Icelandic adult survey (Ólason, 2012) and a British national survey (Wardle et al. 2011). The highest average ATGS scores measured were among problem gamblers (M = 44,6), followed by low level gamblers (M = 41,4) and male participants (M = 41,4). The average ATGS value among problem gamblers was the only one in a range indicating positivity towards gambling. All the other average ATGS scores were less than 42 and therefore indicated attitudes that were negative. As in two British national surveys and a recent Icelandic adult survey men had significantly more positive attitudes towards gambling

than women (Ólason, 2012; Wardle et al., 2011; Wardle et al., 2007). Furthermore, as well as in the British prevalence survey 2007 and the Icelandic adult survey, younger students aged 18 to 25 were also more positive towards gambling than students who were older (Ólason, 2012; Wardle et al., 2007). In line with both British prevalence surveys, widowed or divorced students were most negative towards gambling while singles had the most positive attitude (Wardle, et al. 2011; Wardle, et al. 2007). Problem gambling was significantly related to attitudes towards gambling. The higher the PGSI scores the more positive was the attitude towards gambling. Gamblers who played weekly were much more positive towards gambling than participants who gambled just on a monthly basis. Frequency of gambling was therefore also positively related to attitudes towards gambling. As in both British surveys (Wardle, et al., 2011; Wardle et al., 2007), students who gambled more often were also more positive towards gambling. Out of those findings, it can be assumed that attitudes towards gambling and gambling behaviour are indeed related (Wardle, et al., 2011).

Interestingly, even though the overall attitude towards gambling of the student sample was negative 78,4% gambled at least once in the previous year. In order to evaluate if some gambling activities are not perceived as truly gambling, the relation between participation in each game and ATGS scores were examined. Even when controlled for gender, individuals who played poker with friends, family and work mates, participated in poker competitions, gambled on slot machines, had Lotto subscriptions or placed football bets at shops, had significantly more positive attitudes towards gambling than individuals who did not participate in such games. Participation in poker games in general was related to a more positive attitude towards gambling as well as gambling on foreign webpages. None of the gambling activities studied were not considered as gambling activities by the participants. A search for individuals with negative opinions about gambling who still participated nonetheless had no results.

4.6 Conclusion

Most of the students (78,4%) had gambled at least once in the previous year. Prevalence of problem gambling among the sample was 0,4% while moderate risk gambling was 1,9%. Students who gambled both online and on land-based venues were more likely to be problematic gamblers (4,1%) than students who gambled solely on land-based venues (1,4%). Individuals who played poker were also more likely to be problematic gamblers (6,3%) than individuals who played other games (1,4%). Coping strategies on the other hand, had no relation to gambling behaviour. Attitudes towards gambling were significantly more positive

among problematic gamblers and individuals who played more frequently. Attitudes towards gambling and gambling behaviour were therefore found to be related.

As we can see that poker playing indeed has a relationship to problem gambling it would be interesting to survey poker players further. Questionnaires on online poker websites or surveys among participants of illegal cash poker games would be an interesting comparison. Online gambling is another field that has to be explored more. Attitudes towards gambling seem to have a relationship with actual gambling behaviour, so it would be interesting to survey that relationship further. The resulting insight might in turn be helpful in problem gambling prevention. Coping strategies on the other hand seem not to be related to gambling behaviour.

Due to the low response rate (12,05%) conclusions concerning the whole Icelandic student population can be drawn only with reservation. Furthermore, the fact that several of the data was not normally distributed was obstructive, as the t- test could not be performed and the weaker U test and non-parametric test had to be used.

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Appendix A: E-mail to the students

Kæri nemandi,

lítið er vitað um þátttöku íslenskra háskólanema í peningaspilum eða fjölda þeirra nemenda sem hugsanlega eiga við vanda að stríða vegna þátttöku sinnar. Mikilvægt er að afla þessara upplýsinga til að hægt sé að meta þörf á meðferðar og forvarnarstarfi í þessum málaflokki.

Nafn þitt kom upp í slembiúrtaki háskólanema og biðjum við þig vinsamlegast að svara könnuninni sem er í rafrænu formi (Netkönnun) með því að **velja tengil hér að neðan**.

Svörun tekur u.þ.b. 15 til 20 mínútur. Farið verður með öll gögn sem trúnaðarmál og nafn þitt mun hvergi koma fram og þú þarft ekki að gefa upp neinar persónugreinanlegar upplýsingar.

Þátttakendum er einnig frjálst að hafna þátttöku hvenær sem er eða svara ekki einstökum spurningum. Það er þó mikilvægt að þú vitir að niðurstöður koma að mestu gagni ef þú reynir að svara öllum spurningunum eftir bestu getu, jafnvel þó þér finnist að þær hafi komið fram áður. *Til að tryggja að niðurstöður verði sem áreiðanlegastar er því mjög mikilvægt að sem flestir sjái sér fært að taka þátt í könnuninni, **jafnvel þó þeir spili peningaspil lítið eða ekki neitt.***

Ef fram kemur tilfinningaleg vanlíðan eða spurningar vakna meðal þátttakenda á meðan á könnun stendur má hafa samband við ábyrgðarmann rannsóknar, Dr. Daniel Þór Ólason (sími 5255265; netfang: dto@hi.is). Einnig má fá frekari upplýsingar um spilaflíkn og upplýsingar um aðstoð á vefnum www.abyrghspilun.is.

Þátttakendur geta valið að gefa upp netfang sitt í lok könnunar og átt þar með **möguleika á að vinna eina af þremur 15.000 króna úttektum hjá Bóksölu Stúdenta**. Athugaðu, að ef þú kýst að taka þátt í happdrætti könnunarinnar mun veffang þitt verða geymt í sérstakri gagnaskrá og aldrei verða tengt öðrum svörum í spurningakönnuninni. Veffangaskránni verður eytt að loknum útdrætti.

Rannsóknin er unnin með samþykki Vísindasiðanefndar og tilkynning um hana hefur einnig verið send til Persónuverndar. Ef þú hefur spurningar um rétt þinn sem þátttakandi í vísindarannsókn eða vilt hætta þátttöku í rannsókninni getur þú snúið þér til

Vísindasiðanefndar, Vegmúla 3, 108 Reykjavík. Sími 5517100, fax 5511444, tölvupóstfang: visindasidanefnd@vsn.stjr.is.

Með fyrirfram þökk fyrir þátttökuna:

Dr. Daniel Þór Ólason, Dósent í sálfræði við Háskóla Íslands (ábyrgðarmaður rannsóknar).

Anne Franziska Müller, MS nemi í sálfræði.

Appendix B: Reminder e-mail to the students

Kæri nemandi,

Fyrir fáeinum vikum síðan sendum við þér netkönnun um þátttöku íslenskra háskólanema í peningaspilum. Því miður hafa undirtektir verið frekar dræmar í þínum háskóla sem mun draga mjög úr áreiðanleika rannsóknarinnar. Það er miður, þar sem mjög mikilvægt er að afla þessara upplýsinga meðal sem flestra háskólanema til að hægt sé að meta þörf á meðferðar- og forvarnarstarfi vegna þátttöku í peningaspilum. Við vonumst til að þú bregðist vel við beiðni okkar nú að taka einungis 15 til 20 mínútur af þínum tíma til að svara könnuninni með því að velja tengil hér að neðan. **Ekki skiptir máli hvort þú spilar ekkert, lítið eða mikið í peningaspilum, öll svör eru jafn mikilvæg.**

Ef þú hefur nú þegar tekið þátt í könnuninni biðjumst við velvirðingar á þessum pósti og þökkum þér kærlega fyrir þátttökuna.

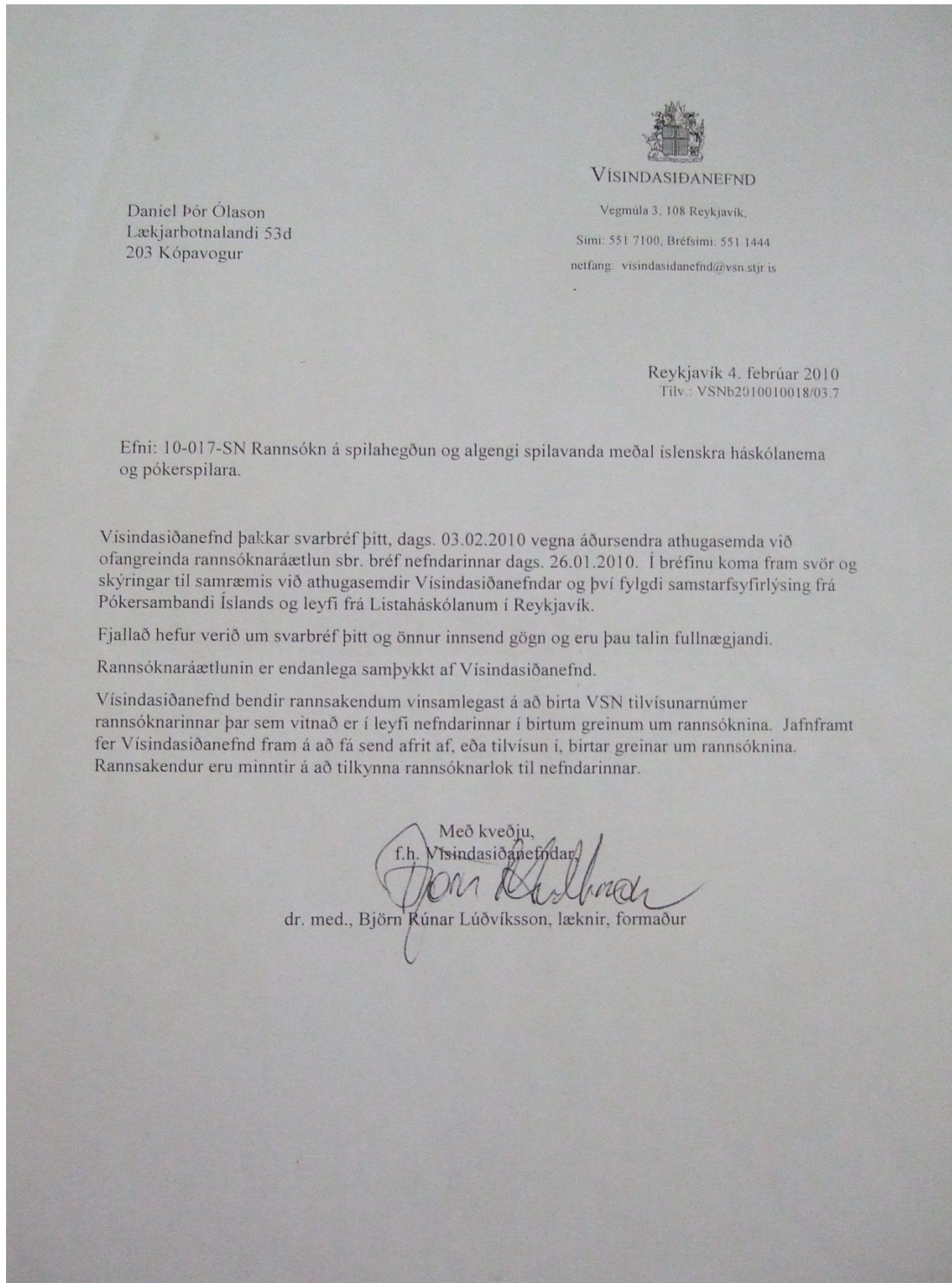
Við minnum ennfreður á að þátttakendur geta valið að gefa upp netfang sitt í lok könnunar og átt þar með **möguleika á að vinna eina af þremur 15.000 króna úttektum hjá Bóksölu Stúdenta**. Athugaðu, að ef þú kýst að taka þátt í happdrætti könnunarinnar mun veffang þitt verða geymt í sérstakri gagnaskrá og aldrei verða tengt öðrum svörum í spurningakönnuninni. Veffangaskránni verður eytt að loknum útdrætti.

Rannsóknin er unnin með samþykki Vísindasiðanefndar og tilkynning um hana hefur einnig verið send til Persónuverndar. Ef þú hefur spurningar um rétt þinn sem þátttakandi í vísindarannsókn eða vilt hætta þátttöku í rannsókninni getur þú snúið þér til Vísindasiðanefndar, Vegmúla 3, 108 Reykjavík. Sími 5517100, fax 5511444, tölvupóstfang: visindasidanefnd@vsn.stjr.is.

Með fyrirfram þökk fyrir þátttökuna:

Dr. Daníel Þór Ólason, Dósent í sálfræði við Háskóla Íslands (ábyrgðarmaður rannsókna).
Anne Franziska Mueller, MS nemi í sálfræði.

Appendix C: Letter from the Icelandic Data Protection Commission



Appendix D: ATGS Pattern Matrix

Pattern matrix^a

	Component	
	1	2
Það eru of mörg tækifæri til að spila peningaspil nú á dögum	,459	-,124
Fólk ætti að eiga rétt á að spila peningaspil hvenær sem það vill	,685	-,130
Það ætti að reyna draga úr þátttöku í peningaspilum	,717	-,021
Flestir spila peningaspil skynsamlega	,532	-,142
Peningaspilun er heimskuleg	,756	-,174
peningaspil eru háskaleg fyrir fjölskyldulífið	,687	-,222
Peningaspil eru mikilvægur þáttur menningar	,677	,345
Peningaspil eru skaðlaus skemmtun	,708	,057
Peningaspil eru tímasóun	,667	-,220
Þegar á heildina er litið eru peningaspil mikill ávinningur fyrir þjóðfélagið	,641	,608
Peningaspil hressa upp á lífið og tilveruna	,749	,017
Það væri betra ef peningaspil væru með öllu bönnuð	,743	-,253
Peningaspil eru eins ávanabindandi og fíkniefni	,650	-,279
Peningaspil eru hagstæð fyrir samfélög	,669	,539

Extraction Methode: Principal Component Analysis.

a. 2 Components extracted.