Chapter 8
Pathological Gambling: Who Gains from Others' Losses?

Ronen Huberfeld and Pinhas N. Dannon

Abstract Gambling is a popular activity across most cultures and throughout history. Overall, gambling all over the world is going through a resurrection during the past decades and becoming a legitimate and socially acceptable form of entertainment. The total casino gambling market grew from USD100 billion in 2006 to USD117 billion in 2010. This market is expected to rise from $117.6 billion in 2010 to $182.8 billion in 2015. Today, millions of families throughout the nation suffer from the effects of problem and pathological gambling. As with other addictive disorders, those who suffer from problem or pathological gambling engage in behavior that is destructive to themselves, their families, their work, and even their communities. The problems include depression, abuse, divorce, homelessness, and suicide, in addition to the individual economic problems. Today, pathological gambling is understood as a complex, multidimensional phenomenon. Current research points out biological, psychological, and social factors are all relevant in the development of problematic levels of gambling. Prevalence surveys indicate that only a small proportion (<10 %) of individuals who have gambling disorders seek formal treatment. Accepted treatment strategies combine pharmacological and psychological intervention with long-term follow-up.

Gambling is a popular activity across most cultures and throughout history. Chinese gambling has been known for more than 4,000 years, while archeological findings of gambling have been traced in other regions: Ur (2000 BC), Crete (1800 BC), Egypt (1600 BC), and India (1000 BC). While some Indian resources testify of the popularity of gambling, other resources indicate the importance of control and the taxation of gambling (McMillen, 1996; Petry, 2005).

R. Huberfeld • P.N. Dannon (✉)
Beer Yaakov Mental Health and Rehabilitation Center,
Sackler School of Medicine, Tel Aviv University, PO Box 1, Beer Yaakov, Israel
e-mail: ronen.huberfeld@gmail.com; pinhasd@post.tau.ac.il

E. Bijleveld and H. Aarts (eds.), *The Psychological Science of Money*,
DOI 10.1007/978-1-4939-0959-9_8,

Throughout the years Jewish tradition has condemned gambling. Gambling for money was viewed in the Talmud as a form of thievery. Moreover, professional gamblers were disqualified from being accepted as legitimate witnesses in a Jewish court of law and were considered unfit for testimony. However, Jewish resources indicate that in Eastern Europe, card playing on Chanukah was traditional for adults. Most researchers of Jewish customs associate this gambling custom with the fact that Jews played dice or cards in order to distract the Greek soldiers, allowing the Jewish guerilla fighters to hide or escape.

Early explorers in New York witnessed native tribe members gamble by rolling stone dice, while historical reports claim that George Washington purchased the first ticket for a lottery that financed the colony of Virginia's development (Petry, 2005). In Australia, gambling was common in Aboriginal Communities often involving objects carved from plant or animal matter and developed during the British settlement. Overall, gambling all over the world is going through a resurrection during the past decades and becoming a legitimate and socially acceptable form of entertainment (Ashley & Boehlke, 2012; Dalfabbro & King, 2012; Dembinsky, Iancu, & Dannon, 2007; Haugen, 2006).

Nowadays, legalized gambling generates greater revenue than any other popular leisure-time activity, and demand for gambling services is rising all over the world. Hence gambling is expanding due to a number of reasons:

1. Increasing amounts of discretionary income among the general population (especially in the post-World War II era and in Eastern Europe since the collapse of the Soviet Union).
2. An increased willingness of national and regional governments to authorize and exploit commercial- and government-offered gambling services.
3. A greater social acceptance of gambling as a recreational activity, a desire to combat illegal gambling activities and related adverse consequences, and a willingness to exploit economic rents that can emerge from legal gambling services. Amateur sporting organizations and specified benefactors or "good causes" can capture substantial economic rent from the legalized profits.
4. A general liberalization in moral and ethical attitudes toward gambling, including a lenient attitude of organized religions, whose followers have traditionally viewed gambling as immoral and socially destructive behavior.
5. The increasing integration of gambling with other fields that have been growing in popularity (professional sporting events, horse and automobile racing, television, and cinema).
6. The development of new gaming services due to modern computers, the Internet, and telecommunications technologies. These include Internet-based tournaments, betting markets, betting exchanges, and interactive TV (Ashley & Boehlke, 2012; Delfabbro, 2012; Haugen, 2006).

Policy makers often strive to maximize economic rents that can finance various specified benefactors such as national, regional, or local-government purposes (such as education, health, or sports), or "good causes." On the other hand, governments and official organizations attempt to protect consumers from fraud and criminal

activities, as well as from potential vulnerabilities of excessive gambling (usually doing so through imposed constraints) (Schwer, Thompson, & Nakamura, 2003; Swiss Institute of Comparative Law, 2006).

Gambling Revenues: Who Makes the Profit?

Gambling is a widely and rapidly growing field all over the world. The total casino gambling market grew from USD100 billion in 2006 to USD117 billion in 2010. This market is expected to rise from $117.6 billion in 2010 to $182.8 billion in 2015.

Though aggregate gross gambling revenues (GGRs) are similar between the USA and EU as of 2003, their composition differs considerably between the European Union member states as a group and the USA. It is estimated that the total amount of gambling in the EU was more than €50 billion (casino 15 %, lottery 45 %, gaming machines and betting services around 18 % each).

In the USA, commercial and tribal casinos generated about USD42.1 billion (58 % of the US total GGRs) in 2003, and in 2010, the casino market in the USA was around USD57 billion. Gambling has become a highly developed and profitable business for Native American Indian tribes. In the last decade the tribal gaming revenues increased dramatically from USD14.7 billion in 2002 to USD27.2 billion in 2011. The casino market in the USA is expected to rise from USD57.5 billion in 2010 to USD73.3 billion in 2015.

In the EU in 2003, casinos brought in only about €7.5 billion (15 % of the EU total GGRs), and in 2010 the casino market was around USD13 billion. France had the largest casino market in 2010 at USD3.8 billion, followed by Germany and South Africa at USD2.0 and USD1.8 billion, respectively. In the UK, the casino market was expected to expand as a result of the Gambling Act of 2005, but this growth has not yet taken place for a variety of reasons, such as the smoking ban, changes in machine regulation, and the delay in new casino licensing. In the Netherlands casino revenues fell by 27.7 % between 2007 and 2010 due to the recession, the introduction of a smoking ban, and an increase in the gambling tax.

In the USA, gaming machines (slot machines, Electronic Gaming Devices, or Video Lottery Terminals) outside of casinos are still relatively uncommon and as such generated GGRs of $3.9 billion (5 % of the US total GGRs), whereas in the European Union, gaming machines generated GGRs of €9.7 billion (19 % of the EU total GGRs). Lotteries in the USA generated GGRs of $17.4 billion (which represent 24 % of US GGRs), whereas in the EU, lottery GGRs were €23.0 billion (45 % of the EU total GGRs). Betting services, including on-track and off-track betting on horses and sports amounted to only $3.9 billion in the USA (5 % of US GGRs), whereas in the EU, the comparable statistic was €8.9 billion (17 % of the EU total GGRs). Finally, bingo services and charitable gambling generated about $4 billion in the USA (5 % of US GGRs), and in the EU, bingo services were also a relatively small component at €2.4 billion (5 % of the EU total GGRs).

In The UK gaming and betting markets are well developed, with the exception of their casino industry, which is undergoing considerable change. The UK lottery comprises 33 % of the GGR and betting services comprise 35 % of the GGR. Casino revenues comprise less than 10 % of the GGR. In 2001 the total UK spend (i.e., the money lost, or money staked minus winnings) on gambling was €10.6 billion or €8.41 per household per week, representing about 1.2 % of household income or the equivalent to about 11 % of all the spending on leisure goods and services. A survey conducted in 2004 found that 71 % of British citizens had gambled during the previous year. The survey found that the general attitudes towards gambling were unfavorable with the exception of lotteries and bingo (attitudes towards gaming machines, Internet gambling, and betting exchanges were the most unfavorable). However, in the case of Internet gambling, 47 % of respondents stated that they were neither favorable nor unfavorable or did not have an opinion (Schwer et al., 2003; Swiss Institute of Comparative Law, 2006).

The UK lottery comprises 33 % of the GGR and betting services comprise 35 % of the GGR. Casino revenues comprise less than 10 % of the GGR. In 2001 the total UK spend (i.e., the money lost, or money staked minus winnings) on gambling was €10.6 billion or €8.41 per household per week, representing about 1.2 % of household income or the equivalent to about 11 % of all the spending on leisure goods and services. In Spain machine gaming comprises 50 % of the GGR and lottery comprises 25 % of the GGR. Again, casino revenues comprise less than 10 % of the GGR. It is worth mentioning that betting services, including sports betting, comprise less than 2 % of the GGR, despite the enormous interest in Spanish football worldwide and in Spain itself. Perhaps illegal gambling is widespread and dominant. In the Netherlands, lottery, casino, and gaming machines comprise 40 %, 35 %, and 25 % of the GGR, respectively. In Germany and Italy lottery is the popular gambling form, comprising over 50 % of the GGR (Schwer et al., 2003; Swiss Institute of Comparative Law, 2006).

In the Far East, there has been an almost fivefold increase in the number of casinos between 1995 and 2010. Although a substantial proportion of the growth in casinos over this period can be attributed to the recent growing gambling industry in Macau, the number of casino venues has also increased significantly in other locations, such as the Philippines and South Korea. In the last two decades, illegal gambling (along with legal lotteries) and the illusion of getting rich quickly are becoming a serious social problem in mainland China, resulting in a significant increase in the rates of problem gambling. Illegal gambling takes place in card and mahjong schools, in underground casinos, through unofficial lotteries, and on websites catering to Internet gamblers. Around USD150 billion are wagered illegally each year in mainland China, which is approximately 10 times the amount of the two officially sanctioned lotteries in China (Tse, Yu, Rossen, & Wang, 2010). Unlike in mainland China, gambling in Macau has been legalized and heavily promoted. Gambling has been a significant contributor to the city's economy since the 1850s. Since the handover of Macau from Portugal to China in 1999, there has been a dramatic rise in the number of casinos. Macau has been known as the "Oriental Las Vegas." Other forms of gambling are also available in Macau, including horse racing, greyhound racing, sports betting, and a number of lotteries. In 2003, the Macao Gaming

Inspection and Coordination Bureau reported that the gambling tax contributed 74 % to the Macau fiscal revenue. In 2004, the percentage rose to almost 78 % of the Macau total public revenue (approximately USD1.9 billion). In 2006 the Macao casino gambling market was USD7 billion, rising to USD23.5 billion in 2010 and expected to rise to as much as USD62 billion in 2015 (PwC, 2011; Tse et al., 2010).

The Asia Pacific casino gambling market, which paused in 2009, rose dramatically in 2010, driven by new capacity in Macau and Singapore. The forecast is that the growth in Asian casino revenues will be higher than growth in the USA and EU up until 2015 and will reshape the landscape of the global industry. Furthermore, Asia Pacific will account for 43.4 % of total global revenues, ahead of the USA. Singapore's dramatic emergence as a casino gaming center, surging from 0 in 2009 to revenues totaling more than USD4 billion in 2011, is expected to be more than USD7 billion in 2015. The casino market in Asia Pacific grew from USD13 billion in 2006 to USD34 billion in 2010 and is expected to rise even more, to USD80 billion in 2015 (PwC, 2011).

Israeli gambler spends approximately 300 NIS (USD80) a week. Israelis have spent 1.6 billion NIS (USD0.4 billion) in legal state gambling while spending 3 billion NIS (USD0.8 billion) on illegal gambling. Internet gambling in Israel is estimated around 10 billion NIS. Even though there are no legal casinos in Israel, 47 % of the Israeli adult population has been in a casino abroad or illegal at least once in their lives. Seventy percent has gambled in a casino more than once (Israeli Parliament Center of Information and Research, 2008). The GGR of the Israeli state lottery in 2011 was 5 billion NIS (USD1.4 billion), which is a 25 % growth in comparison to the 2010 GGR. In Israel the sport gambling market alone is estimated to be around USD3 billion, out of which the illegal sport gambling is approximately USD2.5 billion (Israeli Parliament Center of Information and Research, 2008).

The Positive Aspects of Gambling

Besides the clear downside of gambling for individuals, their families, and society as a whole, one must take into account that legalized gambling has had certain positive economic effects in at least some communities. Employees described the new and better jobs they had obtained with the advent of casinos and some even described relocating from other states to the sites of new casinos or leaving minimum-wage jobs, in which they had no benefits, to accept unionized jobs at the casinos at higher compensation. There is no arguing that these employees have better material, health, and retirement benefits going to work for the casinos. Some elected officials express support for gambling and its increased revenues for their cities. They also discuss community improvements made possible since the advent of gambling. In other locations, tribal members mention that gambling and casinos in their tribal lands have provided jobs that had not existed before, improved hospital and clinic facilities, and schools for the benefit of their children. Legalized gambling has provided economic resources, both personal and tribal, and propelled investments in other industries and enterprises (National Gambling Impact Study Commission [NGISC], 1999).

In 1996 more than half a million people were employed by the legal gambling industry, earning more than USD15 billion. In 1995 the casino industry recorded USD22–25 billion in total revenues, paid a total of USD2.9 billion in direct taxes (including federal and state, property, construction sales and use, and gambling taxes), directly employed almost 300,000 people, paid USD7.3 billion in wages, paid an average national wage of approximately USD26,000 (which exceeds that paid in most related fields), invested USD3 for every USD1 earned, created 13 direct jobs for every USD1 million in revenues, supported 400,000 indirect jobs paying USD12.5 billion in wages, and spent a large majority of its revenues within the USA on payroll, taxes, and other expenses. The economic benefits of casino gambling have been especially powerful in economically depressed communities. State, local, and tribal governments report almost unanimously the positive economic impact of gambling. Research shows that casino gambling creates jobs and reduces levels of unemployment and government assistance in communities that have legalized it. According to the Bureau of Indian Affairs (BIA), 156 tribes are involved in gambling activities.

The Indian Gaming Regulatory Act limits use of revenues to three purposes: (1) to fund tribal government operations or programs, (2) to provide for the general welfare of the Indian tribe and its members, and (3) to promote tribal economic development.

In the EU state members, much of the legal gambling revenues are channeled to positive causes and initiatives. In Austria for instance the gambling industry's expenditure for "good causes" include contributions to sport and culture. The Austrian Sport Federation depends largely upon revenues from Austrian lotteries. In 2004 it received almost €38 million in donations from Austrian lotteries. Due to the change in the Austrian Gambling Act, the amount the Austrian Sport Federation receives was increased to €46.8 million in 2005.

In Belgium the National Lottery of Belgium has contributed, at the request of the government, €2,000,000 to the disaster relief efforts for the victims of the 2004 tsunami. The French national monopolies contribute heavily to various charitable organizations each year. The French National Olympic Sport Committee is one of the main beneficiaries of these donations. Its division, the National Foundation for Sports Developments (FNDF), receives 2.9 % of lottery and sports betting turnover. It further receives 0.01 % of horseracing betting turnover (from PMU) and 5 % of the TV sport broadcasting proceeds. German lotteries are taxed at 16.67 % of sales, and much of the remainder after payment of prizes is allocated either to the federal treasury, or to "good causes," which include the arts, culture, charities, education, science, and sports (Schwer et al., 2003; Swiss Institute of Comparative Law, 2006). In Canada only 1–3 % of provincial gaming revenues finding is its way into cultural organizations (Department of Canadian Heritage, 2002).

The Israel state lottery GGR in 2011 was around 5 billion NIS (USD1.4 billion), out of which 1 billion NIS (USD400 million) was transferred to state departments and municipalities, as well as to student scholarships. Moreover another 130 million NIS (USD30 million) were transferred to the state department as lottery winning tax.

Many countries believe that by legalizing gambling they can increase state income and divert more financial resources to fields that are in need. As a side effect, legalized gambling reduces illegal gambling, money laundering, and other criminal issues.

Gambling: Who loses?

The social and financial costs of gambling to society are enormous. NORC estimates that the annual average costs of job loss, unemployment benefits, welfare benefits, poor physical and mental health, and problem or pathological gambling treatment is approximately USD1,200 per pathological gambler per year and approximately USD715 per problem gambler per year (NGISC, 1999).

NORC further estimates that lifetime costs (bankruptcy, arrests, imprisonment, legal fees for divorce, and so forth) are at USD10,550 per pathological gambler, and USD5,130 per problem gambler. With these figures, NORC calculates that the aggregate annual costs of problem and pathological gambling caused by the factors cited above are approximately USD5 billion per year, in addition to USD40 billion in estimated lifetime costs. Other forms of adverse social impact are the increase in criminal activities (i.e., loan sharking, money laundering, organized crime activities, embezzlements, theft related to gambling, etc.) and the corruption of public officials (NGISC, 1999).

Social/financial crises on the individual and the personal costs of pathological gambling are devastating. Ladouceur, Dubé, and Bujold (1994) found that almost a third of PGs attending Gamblers Anonymous reported either that they had filed for bankruptcy or reported debts of USD75,000–150,000. Forty to sixty percent of the cash wagered by individuals in casinos is not physically brought to the casino itself. Casinos extend billions of US dollars in loans to their customers in the form of credit, charging customers on their credit cards as giving cash advances. The fees for cash advances range from 3 to 10 % or more.

Bankruptcy as a result of problem and pathological gambling is not uncommon. As much as 20 % of pathological gamblers report filing bankruptcy (compared to rates of 4.2 % for non-gamblers and 5.5 % for low-risk gamblers). Twenty-two percent of Gamblers Anonymous members surveyed had declared bankruptcy. Bankruptcies in Iowa increased at a rate significantly above the national average in the years following the introduction of casinos (NGISC, 1999). Moreover, losses can lead to criminal acts among those whose employment and economic status present the opportunity for white-collar crimes. It has been proposed that compulsive gamblers are likely to commit "silent" crimes (such as stealing from their family members or their employer, embezzlement, forgery, and fraud).

Compulsive gamblers often rationalize a crime by looking at it as a short-term loan which will be returned after the "big win." This rationalization is the reason why a crime can go undetected for some time before it is discovered. Some studies of Gamblers Anonymous members and persons in treatment for compulsive gambling

determined that roughly two-thirds admitted to committing crimes or civil fraud to finance their gambling or to pay gambling-related debts (Defense Human Resources Agency [DHRD], 2010). It is estimated that approximately 30 % of PG have made a false claim after an auto accident, 20 % of PG have stolen things, that they knew an insurance company would have to pay for, and almost 50 % of PG have been engaged in at least one insurance fraud or theft (NGISC, 1999).

Research studies on compulsive gamblers in Australia, Germany, and Scotland have confirmed a similar pattern. Some studies suggest that the most common crimes are fraud (38 %), theft at work (23 %), embezzlement (22 %), and theft from family (21 %) (DHRD, 2010). Other studies' results are varied with respect to the effect of casinos on crime, with findings of no change or increases and decreases in crime with the introduction of casino gambling. Some researchers find that there is no difference in crime rate between Atlantic City (with casinos) and two other New Jersey tourist destinations; an increase in crime in Atlantic City due to tourism is also one of the findings. Other researchers have studied the relationship between lotteries and crime. Their findings demonstrate a 3 % increase in crime with the presence of a state lottery.

In the USA Commission report there are repeated testimonies of desperate gamblers committing illegal acts to finance their problem and pathological gambling. Some examples include a Detroit man who faked his own son's kidnapping to pay back a $50,000 gambling debt and a 14-year hospital employee in Iowa who embezzled $151,000 from her employer for gambling. In a survey of nearly 400 Gamblers Anonymous members, 57 % admitted stealing to finance their gambling. Collectively they stole USD30 million for an average of USD135,000 per individual. In Louisiana, one man confessed to robbing and murdering six elderly individuals to feed his problem with gambling on electronic gambling devices (NGISC, 1999).

Researchers have found that pathological gamblers have higher arrest and imprisonment rates than non-pathological gamblers. Around one-third of problem and pathological gamblers have been arrested, compared to 10 % of low-risk gamblers and 4 % of non-gamblers. About 23 % of pathological gamblers have been imprisoned, and so have 13 % of problem gamblers. These arrests and imprisonments cause a heavy financial burden, which is estimated to be about USD1,000 in excess lifetime police costs for problem and pathological gamblers each and a cost of USD10,000 for the 32 % of pathological gamblers arrested. It is postulated that with the increase of legalized gambling, there is also an increase in youth crime, forgery and credit-card theft, domestic violence, child neglect, problem gambling, and alcohol and drug offenses (NGISC, 1999).

The advertisement materials for a lottery promote gambling as a quick and easy means of profit without working. They are aimed at the most vulnerable populations (immigrants, minorities, and economically disadvantaged individuals). The participation of low-income people in gambling has been referred to as "regressive taxation" and "a tax on the poor." Legal gambling (as state lotteries), as well as illegal gambling organizations, exploit the vulnerability of low socioeconomic populations by placing more gambling stands and machines in their neighborhoods deliberately.

Hence, on the one hand gambling revenues increase, and on the other hand there are more individual and familial financial crises and a higher economic burden on society.

Today, millions of families throughout the nation suffer from the effects of problem and pathological gambling. As with other addictive disorders, those who suffer from problem or pathological gambling engage in behavior that is destructive to themselves, their families, their work, and even their communities. The problems include depression, abuse, divorce, homelessness, and suicide, in addition to the individual economic problems discussed previously. The impact of these problems on the future of our communities and the next generation is indeterminable.

In Israel, the establishment and development of a first casino is under social and legal debate. Israeli police is warning that criminal acts such as money laundering will increase greatly due to casino-legalized gambling. Illegal gambling in Israel is estimated to be around 10–15 billion NIS (USD2.7–4 billion) and is considered to be one of the main causes for money laundering, the illegal loan market, violent crimes, and other criminal acts.

Illegal "sports gambling" not only catalyzes criminal activity but also diverts and distorts sport games and scores. Criminal organizations can bribe or threaten/extort sports players and coaches and referees in order to influence sports game scores. Criminal organizations can also use sports teams as a money-laundering platform and buy or sell sports players in order to influence and distort sports game scores. Sports gambling and criminal acts are widespread. Some of the most famous include the following:

The 2006 Italian football scandal involved Italy's top professional football leagues, Serie A and Serie B. The Italian police uncovered relations between referee organizations and team managers of league champions Juventus and other major teams including AC Milan, Fiorentina, Lazio, and Reggina. The teams were accused of rigging games by selecting favorable referees. Juventus was heavily punished through the stripping of 2005 and 2006 Serie A titles. It was expelled from the 2006–2007 UEFA Champions League and relegated to Serie B.

The 2011 Turkish Sports corruption scandal was an investigation into match fixing, bribery, organized crime, and extortion in Turkey's top two association football divisions, the Süper Lig and First League, and the Turkish Basketball League. The Fenerbahce chairman was sentenced to 3 years and 9 months in prison for match-fixing and 2 years and 6 months for forming an illegal organization.

In early 2005, German football was overshadowed by the discovery of a €2 million match-fixing scandal centered on a second division referee, who confessed to fixing and betting on matches in the second Bundesliga, the DFB-Pokal (German Cup), and the third division Regionalliga. Numerous players, coaches, and officials were accused of involvement with an organized crime group in the scheme. Indications were that the referee had regular meetings in Berlin with a Croatian gambling syndicate connected to an organized crime group. In 2005 a number of people were taken into custody, including the operators of a sports betting agency.

Suicidality

Emerging evidence suggests that gambling severity elevates the risk for suicidal ideation and behavior. Due to the nature of individual and social costs, some individuals may view suicide as the only viable solution to both their emotional and financial distress (Hodgins, Mansley, & Thygesen, 2006). It has been proposed that PGs are 5–10 times more likely to attempt suicide than the general population (Blaszczynski, Huynh, Dumlao, & Farrell, 1998). Other studies have found that 36–50 % have a history of suicidal ideation, and 20–30 % have made suicide attempts (Dalfabbro & King, 2012). The comorbidity of mood and substance-use disorders, which are highly associated with suicide, raises suicidal risk in PGs even more (Crockford & el-Guebaly, 1998). However, some data point to the fact that gambling-related suicide attempts tend to have a prior non-gambling-related suicidal ideation. Hence, it appears that gambling problems are part of a number of stressors that may contribute to suicidal ideation and attempts (Dalfabbro & King, 2012; DHRD, 2010).

Internet Gambling

Since the emergence of the Internet in the 1990s, an increasing number of gambling services have become available online or through other new remote communications technologies. The Internet gaming sector is the sector which offers gambling services via the Internet, through mobile phone services, and through interactive television wagering. In the EU, for example, Internet gambling represented between €2 billion and €3 billion in GGRs in 2004. The amount is growing rapidly. The global remote and Internet gaming industry was forecast to grow from about USD9 billion (€7.5 billion) in 2004 to USD25 billion (€20.8 billion) in 2010. The rapid technological development, commercial initiatives, and market penetration have made this sector of the gambling services industries extremely dynamic and fast growing (Schwer et al., 2003; Swiss Institute of Comparative Law, 2006).

The Internet, advanced cellular phones, and other remote communication make gambling easy and available almost everywhere, anytime. People of all socioeconomic statuses can gamble in conventional venues as well as on some new forms, such as betting exchanges, tournaments, and spread betting and poker, which are not so readily available in conventional venues. Malta and the UK already have laws permitting and regulating Internet gambling on their statute books. Anti-money laundering provisions are strictly enforced in order to ensure that all licensed gaming is untainted by criminality.

Gibraltar hosts a number of Internet gambling companies that account for a large share of the world's Internet gambling. The huge advantage of remote gambling is the wide gambling market, which is served outside the specific country that hosts the gambling service company.

A number of factors make substantial growth of remote gambling inevitable:

1. An increasing proportion of the population has access to the relevant technologies
2. The technologies are becoming increasingly user friendly
3. The technologies are becoming increasingly integrated; for example, smart phones and tablets
4. These systems have automated and convenient electronic billing systems which make financial transactions easy and safe
5. Nowadays adult populations are familiar with playing electronic games and computers in their everyday lives
6. Spending time and money on leisure is increasing
7. Spending money on home-based entertainment is increasing

The anonymity of gambling and the opportunity to gamble large amounts of money make Internet gambling a fertile soil for PG and gambling companies. In 2005 ARGO (The Association of Remote Gambling Operators) suggested that the world interactive gambling market is worth somewhere between €5,700 million and €9,900 million in annual revenues and growing. Estimates for Internet-based Global Gambling Revenues by Christiansen Capital Advisers were about €10,000 million in 2005 and €20,220 million in 2010 (Schwer et al., 2003; Swiss Institute of Comparative Law, 2006). In reality the growth was far beyond expected, and in 2012 the extent of Internet sport gambling alone was around USD50 billion.

Legal control over Internet gambling is limited to only 28 states all around the world. Seven of these are European. One must remember that, especially in Internet sport gambling, it is relatively easy to make huge profits from diversion of games and scores. Sports teams might serve also as an optimal tool for laundering money. Criminal organizations use sport and Internet gambling for profit and money laundering.

Nowadays governments' attention has been caught by the potential of legalized and licensed online gaming services as a valuable source of tax revenues. The leading argument is that, since consumers will engage in illegal online gaming anyway, it is better to license and tax it than to allow the revenues to slip away. The UK remains the largest online gaming market globally, having legalized it in 2005 (PwC, 2011).

Pathological Gambling

Although it was first mentioned in the medical literature in the early 1800s, the APA did not classify pathological gambling as a psychiatric disorder until the 1980s (DSM-III). Nowadays pathological gambling is classified, along with pyromania, kleptomania, trichotillomania, and intermittent explosive disorder, as an "impulse control disorder not elsewhere specified."

Two categories of gambling disorders have been established: pathological gambling and problem gambling. The pathological gambling diagnostic criteria are

described in both the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revision (DSM-IV-TR) (American Psychiatric Association [APA], 2000) and the International Classification of Diseases, 10th revision (ICD-10) (World Health Organisation [WHO], 1992), while problem gambling is an informal definition which is typically reported in prevalence surveys and is usually observed as a less severe form of gambling disorder (this category is not included in either the DSM-IV or the ICD-10; Hodgins, Stea, & Grant, 2011).

Individuals with pathological gambling (PG) engage in a persistent and recurrent maladaptive pattern of gambling behavior. This disorder has a chronically progressive course. Typically the patients' lives become dominated by gambling behavior, leading to overwhelming financial burdens and an inability to maintain a career. The gambling has potential to disintegrate a family structure (APA, 2000). The enormous personal and social consequences of this disorder include among the poor consequences a high rate of suicide attempts, an increased rate of legal problems, and criminal behavior (APA, 2000).

Gambling disorders affect 0.2–5.3 % of adults worldwide (measurement and prevalence vary according to the screening instruments, methods used, and the availability and accessibility of gambling opportunities, variables that could explain the wide range in the statistics). In the USA alone, reported rates of pathological gambling range from 0.4 to 1.1 % of adults, with an additional 1–2 % identified as problem gamblers. Statistics indicate that approximately 85 % of all Americans have gambled at least once in their lives (Dannon, Lowengrub, Gonopolski, Musin, & Kotler, 2006; Iancu, Lowengrub, Dembinsky, Kotler, & Dannon, 2008). The 2001/2002 National Epidemiologic Survey on Alcohol and Related Conditions confirmed that, based on the DSM-IV assessment of pathological gambling, Asians, blacks, and Native Americans have a significantly higher lifetime prevalence of disordered gambling than whites. The reported lifetime prevalence of disordered gambling among the USA population is estimated to be as follows: Native Americans/Asian—2.3 %, blacks—2.2 %, Hispanics—1 % and whites—1.2 % (Tse et al., 2010). Emerging evidence in the USA and New Zealand suggest that Chinese immigrants may develop higher rates of problem gambling with increased years of residency in newly adopted countries (Jacques, Ladouceur, & Feriand, 2000; Tse et al., 2010). Studies show that the median money lost by Asians (the majority is Chinese) who presented to problem-gambling intervention services in 2006 was almost four times higher compared to non-Asians.

Other surveys conducted specifically on Asian American and Pacific Islander (AAPI) communities have resulted in varying numbers. A 1997 community survey conducted in San Francisco found that 14.7 % of Chinese subjects identified themselves as problem gamblers, and 21 % met the criteria for pathological gambling. 0n a 2002 community survey of Southeast Asian refugees in Connecticut, 59 % of Laotians, Cambodians, and Vietnamese met criteria for pathological gambling (Fong & Tsuang, 2007; Petry, Armentano, Kuoch, Norinth, & Smith, 2003; Woo, 2003).

Various studies have found that problem gambling rates in Chinese communities are 1.5 to 5 times higher than those of local people (Iancu et al., 2008; Mason & Arnold, 2007; Sharpe & Tarrier, 1993). Not only do Chinese minority groups have

a relatively higher rate among immigrants, in China itself there are high rates of problem gambling. Certain studies estimate a range between 2.5 and 4 % of the adult Chinese population compared to between 1.5 and 2 % in Western populations. A population-based study in Hong Kong found that up to 6 % of the respondents met the diagnostic classification of probable problem and pathological gambling, whereas nationwide surveys in the USA and New Zealand invariably show lower rates of problem gambling, 1.8 % and 1.2 %, respectively (Fong & Tsuang, 2007; Loo, Raylu, & Oei, 2008; Mason & Arnold, 2007; Petry, 2005; Wong & So, 2003).

The prevalence of gambling in the adult population was estimated to be around 70 % in 2001, 66 % of which gambles every day. Studies implicate that 5–15 % of social gamblers will become PG due to the opening of a casino nearby. Hodgins et al. (2011) and Johansson et al. mentioned a few risk factors that are associated with gambling problems, including:

- *Young age*—age of onset (before age 21) was shown to be a significant risk factor for PG.
- *Male sex*—In most studies, male gender has been indicated as a significant risk factor for PG. Some studies have indicated that females are at higher risk than men in aboriginals.
- Non-white ethnic origin—African-American, Hispanic, or Asian were all risk factors for problematic gambling. One study suggested that being born outside the country was shown to be a risk factor for gambling problems.
- *Low socioeconomic status*—Volberg, Abbott, Rönnberg, and Munck (2001) suggested that being on social welfare was a significant risk factor for gambling problems.
- *Divorced or separated marital status*—studies implicated contradicting results, but most authors consider being a single as one of the risk factors for PG (Johansson, Grant, Kim, Odlaug, & Götestam, 2009).

Today, pathological gambling is understood as a complex, multidimensional phenomenon. Current research points out biological, psychological, and social factors are all relevant in the development of problematic levels of gambling. Out of several models which have been proposed to explain the cause of gambling disorders during the last decades, we will mention two predominant integrative models: the bio-psychosocial model and the pathways model.

The bio-psychosocial model attempt to explain PG as a combination of: (1) biological factors (genetic, anatomic and biochemical factors); (2) psychological factors (emotional, thoughts and conflicts); (3) social/environmental factors.

The pathways model is a schema that hypothesizes the existence of three subgroups of pathological gamblers. Each subgroup is subjected to environmental variables, operant and classical conditioning, and cognitive processes. This model hypothesizes that gambling become pathological in response to the effects of conditioning and distorted cognitions surrounding probability of winning. Pathway 1 gamblers are characterized by environmental variables, operant and classical conditioning, and cognitive processes. Pathway 2 is characterized by the same characteristics of pathway 1 gamblers plus disturbed family and personal histories, poor

coping and problem-solving skills, affective instability due to both biological and psychosocial deficits. This pathway is thought to be a mean of emotional escape through dissociation regulating negative mood states or physiological states. Pathway 3 gamblers are characterized by pathway 2 plus vulnerability toward impulsivity, attention deficits, and antisocial traits (Blaszczynski & Nower, 2002).

It seems that cultural and social factors may encourage problem gambling behaviors. These factors may account for the higher rates of problem gambling, the severity of problem gambling and its onset.

Black, Shaw, McCormick, & Allen (2012) found in their study, that 61 % of subjects with pathological gambling reported experiencing some type of childhood maltreatment, including emotional, verbal, physical or sexual abuse, as well as neglect. These findings are partially consistent with the pathways model which describes a subgroup of individuals with a history of poor coping frequent life events and adverse developmental experiences including abuse. It was suggested that gambling serves to modulate negative affective states or to meet other psychological needs. Childhood exposure to gambling also probably affects gambling behavior later in life and additional environmental factors (e.g., accessibility to gambling, location and type of gambling, size and number of prizes) influence the characteristics and maintenance of gambling activities (Black et al., 2012; Dannon et al., 2006; Hodgins et al., 2011; Iancu et al., 2008).

It has been speculated that for AAPI, psychological and social factors, denial, guilt or shame, coping strategies, acculturation issues, language barriers, and help-seeking behaviors all exacerbate the impact of problem gambling on the gambler, family, and community. Gambling characteristics in these ethnic groups are also different than in the native resident of the host country. The refugees are more likely than Caucasian samples (Sharpe & Tarrier, 1993) to report hiding gambling from others but are less likely than Caucasian samples to claim a win while actually losing, to gamble to win back losses, or to feel guilty about gambling. These latter two items, along with gambling more than intended, are the most frequently endorsed items in Caucasian samples in the same geographic area (Fong & Tsuang, 2007; Welte, Barnes, Wieczorek, & Tidwell, 2004).

The most common comorbid psychiatric disorders of PG are alcohol misuse and substance abuse. Additional comorbid disorders include major depression and dysthymia, manic episodes, generalized anxiety disorder, panic disorder, specific phobias, and social phobia and personality disorders (Dannon et al., 2006; Iancu et al., 2008; Petry, 2005).

There are several screening instruments available; the most well-known is the South Oaks Gambling Screen (SOGS). A briefer screening technique is the nine-item Problem Gambling Severity Index (a subscale of the Canadian Problem Gambling Index). A third screening instrument is the 17-item National Opinion Research Center DSM-IV Screen for Gambling Problems (NODS). The Gambling Treatment Outcome Monitoring System (GAMTOMS) is a multidimensional self-report or interview assessment instrument. GAMTOMS incorporates SOGS and also assesses various domains referring to treatment planning and outcome monitoring,

including gambling frequency, mental health, financial problems, legal problems, and motivation (Hodgins et al., 2011; WHO, 1992).

During the last decades, researchers have found that PG patients are not a homogenous group, and some of the patients diagnosed as PG better resemble patients of other categories. Based on observations of pathological strategic gamblers, Moran (1970a, 1970b) identified five PG subtypes: subcultural, neurotic, impulsive, psychopathic, or symptomatic. Steel and Blaszczynski (1996) identified and matched traits associated with PG: psychological distress, sensation seeking, crime and liveliness, and impulsive-antisocial behavior (this last factor has been found to be the most clinically useful, predicting the worst disease course).

Dannon et al. (2006) and Iancu et al. (2008) proposed that PG patients differ with respect to type and intensity of gambling behavior, psychiatric comorbidity, family history, age of onset, and gender. In their studies they proposed that pathological gamblers may be classified according to three subtypes: (1) the impulsive subtype, (2) the obsessive–compulsive (OC) subtype, and (3) the addictive subtype (Huberfeld, Gersner, Rosenberg, Kotler, & Dannon, 2011).

The impulsive subtype is characterized by young-adult male predominance, high levels of risk-taking behavior, and a lack of ability to plan ahead. These patients tend to lose large sums of money in one sitting. The impulsive subtype is associated with attention-deficit disorder (ADD), alcohol and other substance abuse, and dependence and other impulse control disorders. In first degree relative tends to have high levels of gambling and addiction problems. These individuals have a deficit in the frontal lobe/reward system and probable impairment of executive functions that might play a role in their impulsive behavior.

The obsessive–compulsive (OC) patient, which usually prefers slot machines or lottery and scratch tickets, is characterized by female predominance and midlife onset (probably as a response to a perceived psychological trauma) and tends to be associated with higher rates of depression and maladaptive coping mechanisms.

The addictive subtype is characterized by betting a small amount of money at a time in a repetitive and compulsive fashion. In this group there is a male predominance and higher rates of alcohol abuse and dependence. These individuals show a pattern of deficit in the executive function just like abstinent alcoholics, as was demonstrated in Goudriaan, Oosterlaan, and de Beurs (2006).

Four brain circuits have been proposed to play a role in the development of addictive behavior and as such have also been studied in pathological gambling: (1) the reward circuit, which involves the nucleus accumbens, (2) the motivational and drive circuit, which is located in the orbitofrontal cortex, (3) the memory and learning circuit, which is located in the amygdala and the hippocampus, and (4) the control circuit, which is located in the dorsolateral prefrontal cortex and the anterior cingulated gyrus (Dannon et al., 2006; Iancu et al., 2008). Neuropsychological studies of pathological gamblers have demonstrated deficits in the frontal lobe reward system, which might indicate an impairment of executive functions (Dannon et al., 2006; Iancu et al., 2008).

Reduced activity of the ventral medial prefrontal cortex (vmPFC) has been correlated with impulsive decision making in risk-reward assessments and with diminished response to gambling cues in pathological gamblers. fMRI studies

demonstrated that individuals with PG showed less activation of vmPFC during simulated gambling, and BOLD (blood oxygen level dependence) signal change in vmPFC correlated inversely with gambling severity (Reuter et al., 2005). A similar pattern of diminished activation was observed in the ventral striatum which is a part of the reward system. Associated activation of the reward system with anticipation of working for immediate monetary reward and activation of vmPFC with receipt of immediate monetary rewards (Potenza, 2008). Furthermore, participation in a gambling task increase dopamine release in the ventral striatum in individuals with Parkinson's disease (PD) and pathological gambling than in individuals with PD alone (Grant, Potenza, Weinstein, & Gorelick, 2010).

Potenza et al. (2003) compared PG and control group performing a Stroop task; this fMRI imaging study demonstrated differences in the left ventromedial prefrontal cortex, which plays a role in decision making. Most of these findings are consistent with neuroimaging findings in substance dependence studies (van Holst, van der Brink, Veltman, & Goudriaan, 2010).

Increasing evidence implicates multiple neurotransmitter systems in the pathophysiology of gambling disorders:

1. *Noradrenaline*—Gambling has been associated with autonomic arousal, increased heart rate and increases in noradrenergic measures. During gambling, heart rate and noradrenergic measures are highly increased in individuals with gambling problems (Shinohara et al., 1999).
2. *Serotonin*—Individuals with PG have demonstrated low levels of the serotonin metabolite 5-hydroxy indoleacetic acid. PG individuals also reported a "high" feeling following administration of meta-chlorophenylpiperazine (m-CPP), a partial serotonin agonist that binds to multiple 5HT1 and 5HT2 receptors (similar to the "high" reported by antisocial, borderline, and alcoholic subjects after receiving the drug). Serotonin reuptake inhibitors show mixed results.
3. *Dopamine*—Dopamine is implicated to have a dominant role in the reward system. However, only a few studies have investigated directly the role of dopamine in PG. Ambiguous findings have been reported for cerebrospinal fluid measures of dopamine and its metabolites in PG (Potenza, 2008). In a few genetic studies of pathological gambling, the D2A1 allele of the D2 dopamine receptor gene (DRD2) has been implicated.
4. *Opioids*—Opioids have been implicated in pleasurable and rewarding processes, and opioid function can influence neurotransmission in the ventral striatum (Spanagel, Herz, & Shippenberg, 1992). Some studies have demonstrated that naltrexone and nalmefene were superior to placebo in the treatment of PG (naltrexone however caused liver function test abnormalities).

Grant et al. (2010), Dannon et al. (2006), and Iancu et al. (2008) found that there is sufficient evidence to warrant considering pathological gambling as a non-substance or behavioral addiction. They find that behavioral addictions resemble substance addictions in many domains, including natural history (chronic, relapsing course with higher incidence and prevalence in adolescents and young adults), phenomenology (subjective craving, intoxication "high," and withdrawal), tolerance,

comorbidity, overlapping genetic contribution, neurobiological mechanisms, and response to treatment. The DSM-V task force has proposed shifting its classification in DSM-V from an impulse-control disorder to an addiction and related disorders (a new category encompassing both substance-related and non-substance addictions) Huberfeld et al. (2011).

One of the characteristics of pathological gambling is cognitive distortions. Delfabbro and Winefield (2000) demonstrated that 70 % of gambling-related cognitions were found to be irrational and surprisingly unrelated to the level of reinforcement of the bet. Winning players had more erroneous estimation of their chance to win and more irrational beliefs than losing players (Monaghan & Blaszczynski, 2009).

The erroneous thoughts include personification of the gambling machine, "making deals" with the machine, cursing or insulting the machine and many more. The *gambler's fallacy* is another cognitive distortion which correlates winning or losing in the next game to the results prior to it, even though each bet has its own statistical chance and is independent of the prior results. Some other examples of distorted cognitions include:

Personal control—On any game of chance, the gamblers chance of winning is not correlated to whether the gambler itself arrange their gamble, or if another agent arrange the gamble for them. However it was repeatedly demonstrated that players have inflated confidence and sense of control when they are given the opportunity to arrange the gamble themselves. In one study of roulette players it had been found that higher bets were placed when the player was given the opportunity to throw the roulette ball, compared with trials where the experimenter acted as a croupier and threw the ball (Ladouceur & Mayrand, 1987).

The near-miss effect—This effect means that an unsuccessful bet is proximal to a win. For example, when a slot-machine displays two cherries with the third cherry just coming into view. Surprisingly, Gamblers often interpret near-misses as evidence that they are mastering the game and the gambler feels that he is "not constantly losing but constantly nearly winning" (Clark, 2009).

The illusion of control—This is probably one of the core features of the addictive subtype. Sports gamblers for example, devote most of their time to acquiring sports information, updates, and data and then bet at the very last minute. This tendency of pathological sports gamblers demonstrates the sense or actually illusion of control of a PG over the bet. This illusion of control produces overly optimistic expectations of winning. Huberfeld et al. explored whether a football bet, being a strategic bet, can be predicted with high probability by professional gamblers compared to amateurs and laypersons. They have concluded that there are no significant differences in predicting the match results between those three groups that have been studied (Dannon et al., 2006; Iancu et al., 2008). Other study found that gamblers who preferred skill games or both skill and chance games had more Illusion of Control compared to gamblers with a preference for chance games only. It had been thought that cognitive distortions are associated with playing games that skills are perceived to be a potential component (Myrseth, Brunborg, & Eidem, 2010; Toneatto, Blitz-Miller, Calderwood, Dragonetti, & Tsanos, 1997).

Scoboria and Wilson (2011) demonstrate that believed memory-like representations for future wins and losses also have a part in a gambler's cognitive distortions. In their study they find that when "believed mental representations" for future wins are strong relative to those for future losses, gambling behavior may be reinforced. They also show that engagement in vivid imagination of imagined future wins may also decrease awareness of the gambling problem.

Researchers assume that cognitive distortions are probably incorporated in the neural and neurochemical level. As mentioned above, fMRI studies demonstrated the central role of the ventral striatum and the vmPFC in the brain reward system. If we will assume that money is a potent reward and a conditioned reinforcer and that the brain reward system processes reinforcers for future decision-making ('reinforcement learning'), than we can hypothesize that these brain regions would be highly activated by monetary wins. Moreover, at a neurochemical level, the dominant hypothesis is that dopamine cells code a reward prediction error, meaning the difference between the obtained and the expected reward (Montague, Hyman, & Cohen, 2004). Studies of non-human primates have shown bursts of dopamine activity in response to unexpected rewards. Studies suggest that two of the better-established cognitive distortions in gambling behavior, the near-miss effect and the effect of personal control, are associated with recruitment in components of the brain reward system. Other researchers suggested that the interaction between the frontal lobe and the striatum have a connection to Gambler's Fallacy. These are probably not the exclusive mechanisms which correlate cognitive distortions to psychobiological abnormalities and further research is needed (Clark, 2009).

Treatment Strategies

Prevalence surveys indicate that only a small proportion (<10 %) of individuals who have gambling disorders seek formal treatment. They also indicate that a high percentage of individuals have recovered from gambling problems (about two-thirds of the lifetime rates, suggesting a recovery rate of one-third).

Some data suggest that gambling problems are transient and episodic and that most recovered individuals, just like in other addictive disorders, have accomplished their recoveries without accessing formal treatment services.

Brief Treatment

A brief treatment is not necessarily seen as treatment by the PG. There are several types of brief treatments. One study indicates that telephone-based motivational interview contact combined with a mailed self-help cognitive-behavioral therapy workbook leads to good outcomes over 12- and 24-month follow-up periods. Another study indicated that a 5-min session of behavioral advice and four sessions of motivational enhancement plus cognitive–behavioral therapy are equally

effective for reduction of gambling in individuals not seeking treatment and are more effective than one session of motivational interviewing alone or no treatment (Hodgins et al., 2011).

Family Treatment

There is only limited data on this form of treatment and the samples are small, but some studies, especially those that examine the effects of couple treatment, have shown promising results [Dannon et al., 2006, Iancu et al., 2008, Lee & Rovers, 2008].

Psychosocial Treatment

Various treatment models have been suggested for gambling disorders. In general, post-treatment effects are positive for different types of therapy (e.g., behavioral and cognitive) and methods of therapy (e.g., individual, group, and self-directed) (Hodgins et al., 2011).

Cognitive Behavioral Treatment

There is only limited data on this form of treatment, nevertheless, Grant et al. (2013) reported that both individual CBT and group cognitive therapy have demonstrated improvement in gambling symptoms.

Psychopharmacological Treatment

Studies revealed that pharmacological treatments were more effective than was placebo treatment. Given their ability to modulate dopaminergic transmission in the mesolimbic pathway, opioid receptor antagonists (naltrexone and nalmefene) have been investigated in the treatment of pathological gambling. Studies suggest efficacy of opioid antagonists in reducing the intensity of urges to gamble, gambling thoughts, and gambling behavior. Studies of antipsychotic treatment had no benefit over placebo and trials of bupropion demonstrated contradicted results.

Iancu et al. (2008) and Dannon et al. (2006) suggest treating PG according to its subtype. For the impulsive subtype, they suggest starting with a mood stabilizer (such as lithium, valproate, topiramate, or lamotrigine). If mood-stabilizer therapy is not effective, they recommend switching to SSRIs or SNRIs, after which naltrexone should be tried. For OC subtype, they suggest starting with SSRIs. If these are not

effective, the researchers propose switching to mood stabilizers. For the addictive subtype, they advise starting treatment with bupropion and then switching to naltrexone, if not effective.

Gamblers Anonymous

Gamblers Anonymous self-help groups were started in 1957 in Los Angeles, CA, USA. Nowadays it is operating in at least 55 countries worldwide. Thousands of individuals use a program of 12 steps. Modified from Alcoholics Anonymous, the individual acknowledges powerlessness over compulsive gambling and must remain gambling free. However, treatment-outcome studies that compared Gamblers Anonymous to cognitive–behavioral treatment have indicated poor outcomes for attendees of Gamblers Anonymous (Hodgins et al., 2011).

Conclusions

During the last two decades, gambling has become widespread and enormous. Internet gambling has made gambling all over the world easy and discrete. Anyone who wants to gamble in privacy can do it without limitation of time and place. Due to the growing size of gambling possibilities and opportunities the relationships between money, countries' economics, and gambling suppliers (both legal and illegal) are becoming more and more complex. Moreover, due to the development of gambling and its wide range of possibilities, the number of pathological and problem gamblers is growing.

Unfortunately the diagnosis and treatment possibilities, as well as the funding of research and treatment options, are not growing exponentially to the gambling problem. Governments prefer to make a profit and establish a solid and long-lasting financial resource rather than taking steps to solve or ease the problem of gambling and PG. Furthermore, in certain countries the gambling industry is supported and promoted by the government, including in areas of lower socioeconomic levels (which are more prone to problem gambling or PG as people see it as an opportunity to escape from poverty). Due to these difficulties and the growing problem of gambling, countries and governments must adopt special programs of education, preventive medicine, and research for better diagnosis and treatment of the problems in order to decrease the heavy financial and criminal burdens of gambling.

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders text revision* (4th ed.). Washington, DC: Author.

Ashley, L. L., & Boehlke, K. (2012). Pathological gambling: A general overview. *Journal of Psychoactive Drugs, 44*, 27–37.

Black, D. W., Shaw, M. C., McCormick, B. A., & Allen, J. (2012). Marital status, childhood maltreatment, and family dysfunction: A controlled study of pathological gambling. *Journal of Clinical Psychiatry, 73*(10), 1293–1297.

Blaszczynski, A., Huynh, S., Dumlao, V. J., & Farrell, E. (1998). Problem gambling within a Chinese speaking community. *Journal of Gambling Studies, 14*(4), 359–380.

Blaszczynski, A., & Nower, L. (2002). A pathways model of problem and pathological gambling. *Addiction, 97*, 487–499.

Clark, L. (2009). Decision-making during gambling: An integration of cognitive and psychobiological approaches. *Philosophical Transactions of the Royal Society B: Biological Sciences, 365*(1538), 319–330.

Crockford, D. N., & el-Guebaly, N. (1998). Psychiatric comorbidity in pathological gambling: A critical review. *Canadian Journal of Psychiatry, 43*(1), 43–50.

Dalfabbro, P., & King, D. (2012). Gambling in Australia: Experiences, problems, research and policy. *Addiction, 107*, 1556–1561. doi:10.1111/j.1360-0443.2012.03802.x.

Dannon, P. N., Lowengrub, K., Gonopolski, Y., Musin, E., & Kotler, M. (2006). Pathological gambling: A review of phenomenological models and treatment modalities for under recognized psychiatric disorder. *Primary companion of J of Clinical Psychiatry, 8*(6), 334–339.

Defense Human Resources Agency [DHRD]. (2010). *Adjudicative desk reference: Financial—Gambling*. Retrieved from http://www.dhra.mil/perserec/adr/financesgambling/gambling-frameset.htm

Delfabbro, P. H., & Winefield, A. H. (2000). Predictors of irrational thinking in regular slot machine gamblers. *Journal of Psychology, 134*(2), 117–128.

Dembinsky, Y., Iancu, I., & Dannon, P. (2007). Pathological gambling. *Harefuah, 146*(10), 785–789, 813.

Department of Canadian Heritage. (2002). *Gambling on culture in Canada: Gaming as a source of funding for culture, the arts and heritage.*

Fong, T. W., & Tsuang, J. (2007). Asian-Americans, addictions, and barriers to treatment. *Psychiatry (Edgmont), 4*(11), 51–59.

Goudriaan, A. E., Oosterlaan, J., & de Beurs, E. (2006). Neurocognitive functions in pathological gambling: A comparison with alcohol dependence, Tourette syndrome and normal controls. *Addiction, 101*, 534–547.

Grant, J. E., Potenza, M. N., Weinstein, A., & Gorelick, D. A. (2010). Introduction to behavioral addictions. *American Journal of Drug and Alcohol Abuse, 36*(5), 233–241.

Grant, MD, J. E. (2013). Liana RN Schreiber, Brian L Odiaug. In review phenomenology and treatment of behavioural addictions. *Canadian Journal of Psychiatry, 58*(5), 252–259.

Haugen, D. M. (2006). *Legalized gambling*. New York: Infobase.

Hodgins, D. C., Mansley, C., & Thygesen, K. (2006). Risk factors for suicide ideation and attempts among pathological gamblers. *American Journal on Addictions, 15*(4), 303–310.

Hodgins, D. C., Stea, J. N., & Grant, J. E. (2011). Gambling disorders. *Lancet, 378*, 1874–1884.

Huberfeld, R., Gersner, R., Rosenberg, O., Kotler, M., & Dannon, P. N. (2011). Football gambling three arm-controlled study: Gamblers, amateurs and laypersons. *Psychopathology, 46*(1), 28–33.

Iancu, I., Lowengrub, K., Dembinsky, Y., Kotler, M., & Dannon, P. N. (2008). Pathological gambling: An update on neuropathophysiology and pharmacotherapy. *CNS Drugs, 22*(2), 123–128.

Israeli Parliament Center of Information and Research. (2008). *Gambling in Israel*. Retrieved from www.knesset.gov.il/mmm/data/pdf/m01954.pdf

Jacques, C., Ladouceur, R., & Feriand, F. (2000). Impact of availability on gambling: A longitudinal study. *Canadian Journal of Psychiatry, 45*(9), 810–815.

Johansson, A., Grant, J. E., Kim, S. W., Odlaug, B. L., & Götestam, K. G. (2009). Risk factors for problematic gambling: A critical literature review. *Journal of Gambling Studies, 25*(1), 67–92.

Ladouceur, R., Dubé, D., & Bujold, A. (1994). Prevalence of pathological gambling and related problems among college students in the Quebec metropolitan area. *Canadian Journal of Psychiatry, 39*(5), 289–293.

Ladouceur, R., & Mayrand, M. (1987). Depressive behaviors and gambling. *Psychological Reports, 60*, 1019–1022.
Lee, BK., & Rovers, M. (2008). Bringing torn lives together again: effects of the first congruence couple training application to clients in pathological gambling. *Journal of Gambling Studies 8*, 113–129.
Loo, J. M., Raylu, N., & Oei, T. P. (2008). Gambling among the Chinese: A comprehensive review. *Clinical Psychology Review, 28*, 1152–1166.
Mason, K., & Arnold, R. (2007). Problem gambling risk factors and associated behaviours and health status: Results from the 2002/03 New Zealand Health Survey. *Journal of the New Zealand Medical Association, 120*(1257), U604–U616.
McMillen, J. (1996). Understanding gambling: History, concepts, and theories. In J. McMillen (Ed.), *Gambling cultures: Studies in history and interpretation* (pp. 6–39). New York: Routledge.
Monaghan, S., & Blaszczynski, A. (2009). Consequences of winning: The role of gambling outcomes in the development of irrational beliefs. *Behavioural and Cognitive Psychotherapy, 37*, 49–59.
Montague, P. R., Hyman, S. E., & Cohen, J. D. (2004). Computational roles for dopamine in behavioural control. *Nature, 431*(7010), 760–767.
Moran, E. (1970a). Clinical and social aspects of risk-taking. *Proceeding of the Royal Society of Medicine, 63*, 1273–1277.
Moran, E. (1970b). Varieties of pathological gambling. *British Journal of Psychiatry, 116*, 593–597.
Myrseth, H., Brunborg, G. S., & Eidem, M. (2010). Differences in cognitive distortions between pathological and non-pathological gamblers with preferences for chance or skill games. *Journal of Gambling Studies, 26*, 561–569.
National Gambling Impact Study Commission [NGISC]. (1999). *NGISC Final report*. Washington, DC: NGISC.
Petry, N. M. (2005). *Pathological gambling: Etiology, comorbidity, and treatment*. Washington, DC: American Psychological Association.
Petry, N. M., Armentano, C., Kuoch, T., Norinth, T., & Smith, L. (2003). Gambling participation and problems among South East Asian refugees to the United States. *Psychiatric Services, 54*(8), 1142–1148.
Potenza, M. N. (2008). The neurobiology of pathological gambling and drug addiction: An overview and new findings (Review). *Philosophical Transactions of the Royal Society B: Biological Sciences, 363*(1507), 3181–3189.
Potenza, M. N., Leung, H. C., Blumberg, H. P., Peterson, B. S., Fulbright, R. K., Lacadie, C. M., et al. (2003). An FMRI Stroop task study of ventromedial prefrontal cortical function in pathological gamblers. *American Journal of Psychiatry, 160*(11), 1990–1994.
PwC. (2011). *Global gaming outlook: The casino and online gaming market to 2015.* Retrieved from www.pwc.com/en_GX/gx/entertainment-media/publications/assets/pdf/global-gaming-outlook.pdf
Reuter, J., Raedler, T., Rose, M., Hand, I., Gläscher, J., & Büchel, C. (2005). Pathological gambling is linked to reduced activation of the mesolimbic reward system. *Nature Neuroscience, 8*(2), 147–148.
Schwer, R., Thompson, W., & Nakamura, D. (2003). *Beyond the limits of recreation: Social costs of gambling in Southern Nevada*. Paper presented at the 2003 Annual meeting of the Far West and American Popular Culture Association.
Scoboria, A., & Wilson, T. (2011). Memory for future gambling wins. *Psychology of Addictive Behaviors, 25*(3), 565–572.
Sharpe, L., & Tarrier, N. (1993). Towards a cognitive-behavioural theory of problem gambling. *British Journal of Psychiatry, 162*, 407–412.
Shinohara, K., Yanagisawa, A., Kagota, Y., Gomi, A., Nemoto, K., Moriya, E., et al. (1999). Physiological changes in pachinko players; beta-endorphin, Catecholamines, immune system substances and heart rate. *Journal of Physiological Anthropology, 18*, 37–42.

Spanagel, R., Herz, A., & Shippenberg, T. S. (1992). Opposing tonically active endogenous opioid systems modulate the mesolimbic dopaminergic pathway. *Proceedings of the National Academy of Sciences U S A, 89*, 2046–2050.

Steel, Z., & Blaszczynski, A. (1996). The factorial structure of pathological gambling. *Journal of Gambling Studies, 12*, 3–20.

Swiss Institute of Comparative Law. (2006). *Study of gambling services in the internal market of the European Union: Final report*. Brussels, Belgium: European Commission.

Toneatto, T., Blitz-Miller, T., Calderwood, K., Dragonetti, R., & Tsanos, A. (1997). Cognitive distortions in heavy gambling. *Journal of Gambling Studies, 13*(3), 253–266.

Tse, S., Yu, A. C. H., Rossen, F., & Wang, C. (2010). Examination of Chinese gambling problems through a socio-historical-cultural perspective. *The Scientific World Journal, 10*, 1694–1704.

van Holst, R. J., van der Brink, W., Veltman, D. J., & Goudriaan, A. E. (2010). Brain imaging studies in pathological gambling. *Current Psychiatry Reports, 12*, 418–425.

Volberg, R. A., Abbott, M. W., Rönnberg, S., & Munck, I. M. (2001). Prevalence and risks of pathological gambling in Sweden. *Acta Psychiatrica Scandinavica, 104*(4), 250–256.

Welte, J. W., Barnes, G. M., Wieczorek, W. F., & Tidwell, M. C. (2004). Gambling participantion and pathology in the United States—A sociodemographic analysis using classification trees. *Addictive Behaviors, 29*(5), 983–989.

Wong, T. L. K., & So, E. M. T. (2003). Prevalence estimates of problem and pathological gambling in Hong Kong. *American Journal of Psychiatry, 160*, 1353–1354.

Woo, K. (2003). The Chinese community problem gambling project. *Social Work Today, 21*, 26–29.

World Health Organisation. (1992). *International classification of diseases (ICD-10): Clinical descriptions and diagnostic guidelines*. Geneva, Switzerland: Author.