NATIONAL CENTER FOR RESPONSIBLE GAMING
Advancing Research, Education and Awareness

INCREASING THE ODDS
A Series Dedicated to Understanding Gambling Disorders

VOLUME 7

What Clinicians Need to Know About Gambling Disorders

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Increasing the Odds: A Series to Understanding Gambling Disorders

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INTRODUCTION

Challenges of Treating Addiction and Gambling Disorders

by Christine Reilly
National Center for Responsible Gaming

Health care providers who specialize in addiction face a host of challenges in their clinical practice, including growing pressure from insurers and the government to use evidence-based treatment practices. Because estimates show that it takes as many as 10 to 15 years for research findings to be applied in clinical settings, the gap between research and practice is wide, making it difficult to employ practices that are informed by the most recent research. For the field of gambling disorders, the chasm is especially wide because of the relatively young nature of this research, as compared to studies on alcohol and drug disorders. Since the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders (DSM*) first recognized pathological gambling in 1980, the research base on gambling disorders has grown tremendously, thanks in part to the National Center for Responsible Gaming (NCRG). For more than 16 years, the NCRG has been dedicated to funding scientific research on gambling disorders and translating research findings into practical applications for health care providers and the public.

PARTNERING TO STRENGTHEN CLINICIANS THROUGH EDUCATION

The inspiration for this publication emerged from discussions between the NCRG and NAADAC, the Association for Addiction Professionals, about the development of a new certification program for alcohol and drug counselors interested in becoming specialists on gambling disorders. NAADAC's mission is to lead, unify and empower addiction focused professionals to achieve excellence through education, advocacy, knowledge, standards of practice, ethics, professional development and research. NAADAC shares the NCRG's concerns about the gap between new science and clinical practice in the field of gambling addiction, and the two organizations forged a partnership to develop a new gambling credential.

As a part of this partnership, the NCRG enlisted the help of leading investigators and experts in the field of gambling disorders to write reviews of the seminal research on this topic. These white papers were reviewed by the National Certification Commission for Addiction Professionals (NCC AP), a nationally recognized credentialing body that is independent from NAADAC. The NCC AP's role is to manage certification credentials for substance use disorder and mental health professionals to ensure the highest quality of ethics and standards in that process. Information about a rigorous new gambling specialist credential will be announced in 2013. Details will be available on the NCRG's website at www.ncrg.org as well as www.ptcny.com, the NCC AP's testing and credentialing site.

PURPOSE OF THIS PUBLICATION

The white papers compiled for the new gambling specialist credential form the foundation for this edition of *Increasing the Odds: A Series Dedicated to Understanding Gambling Disorders.* This volume focuses on the essential knowledge base necessary for clinicians to recognize, understand and treat gambling disorders. Although most gamblers with problems don't seek treatment for their gambling behavior,[1] they do seek help for co-occurring disorders. According to the National Comorbidity Survey Replication (NCS-R), approximately

96 percent of people diagnosed with pathological gambling (PG) have or had a problem with another addictive or psychiatric disorder in their lifetime.[2] The authors of this landmark study observed, "Given that three-quarters of PG cases occur only subsequent to the onset of other *DSM-IV* disorders, it seems likely that onset of PG could be prevented if clinicians increased their monitoring for emerging gambling problems."[2 (p. 8)]

Because of this interaction between PG and other disorders, some clients being treated for alcohol, tobacco and drug dependence might also have a hidden gambling disorder. It is important for all mental health professionals to understand and screen for this in their practice. The goal of this volume of Increasing the Odds is to provide health care providers with a better understanding of gambling disorders based on the latest research so that they can improve assessment, diagnosis and treatment of the disorder.

Diagnostic Criteria for Gambling Disorders

The *DSM-IV* currently classifies PG as an impulse control disorder and defines it as "persistent and recurrent maladaptive gambling behavior … that disrupts personal, family or vocational pursuits."[3] According to the *DSM-IV*, an individual who exhibits five or more of the following behaviors likely suffers from PG.

1. A preoccupation with gambling (e.g., preoccupation with reliving past gambling experiences, handicapping or thinking of ways to get money with which to gamble)
2. A need to gamble with increasing amounts of money in order to achieve the desired level of excitement
3. Repeated, unsuccessful efforts to control, cut back or stop gambling
4. Feels restless or irritable when attempting to cut down or stop gambling (withdrawal symptoms)
5. Uses gambling as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of hopelessness, guilt, anxiety and depression)
6. After losing money gambling, often returns another day to get even ("chasing" one's losses)
7. Lies to family members, therapist or others to conceal the extent of one's involvement with gambling
8. Has committed illegal acts such as forgery, fraud, theft or embezzlement to finance gambling
9. Has jeopardized or lost a significant relationship, job or educational or career opportunity because of gambling
10. Relies on others to provide money to relieve a desperate financial situation caused by gambling

Approximately 1 percent of the U.S. population meets the diagnostic criteria for PG. An additional 2 to 3 percent experience several symptoms of a gambling disorder but do not meet the threshold of five of the above behaviors for a diagnosis of PG. Although the DSM does not recognize such a category, researchers have recognized that gambling disorders exist on a continuum and, for the purposes of screening and conducting population surveys, have created a variety of terms including problem gamblers, subclinical gamblers and at-risk gamblers for those who do not meet diagnostic criteria. Some researchers

maintain that individuals in this subclinical population are at risk of becoming pathological gamblers and that these types of gambling problems will likely develop into full-blown disorders. In other words, the assumption is that having several symptoms means the person is on the slippery slope to a serious gambling addiction. However, other investigators have discovered that gambling disorders are more dynamic than static and have concluded that many people may recover fully even if they have had symptoms of a gambling problem.[4,5]

Gambling Addiction Terminology

Confused by the many terms used to describe gambling addiction? You're not alone. Researchers and clinicians often use a variety of terms to describe gambling disorders, including "problem gambling," "pathological gambling," "compulsive gambling" and "probable pathological gambling." For the purpose of this publication, we use the term "pathological gambling" to refer to the diagnosis of the disorder according to the *DSM-IV*. The term "gambling disorders" refers to the whole range of problems, from the subclinical to the full-blown disorder.[i]

What Clinicians Need to Know about Gambling Disorders

This edition of *Increasing the Odds* is a comprehensive summary of the latest research informing our understanding of why some people develop a gambling problem; gambling problems among youth; how to identify and assess clients for gambling disorders; how people recover; and the relationship between gambling and other psychiatric and addictive disorders.

- **Chapter 1:** A foundational understanding of gambling disorders is critical to assessment and treatment of the disorder by clinicians. Nathan Smith focuses on the reasons why some people develop a gambling problem and covers neurobiological vulnerabilities, family history, lifestyle and co-occurring disorders.
- **Chapter 2:** Even though youth are generally not of legal age to gamble, research has estimated that nearly 70 percent of Americans aged 14 to 21 have gambled in the past year.[6] Ken C. Winters, Ph.D., and Randy Stinchfield, Ph.D., L.P., offer the latest findings on youth gambling.
- **Chapter 3:** Dr. Stinchfield offers a critical review of the available instruments for identifying and diagnosing a gambling disorder.
- **Chapter 4:** Jon E. Grant, M.D., J.D., M.P.H., and Brian Odlaug, M.P.H., present the latest on treatment outcomes using psychosocial interventions. They examine the various types of treatment methods that have been deemed as most effective with gambling disorders and other addictions.
- **Chapter 5:** Marc N. Potenza, M.D., Ph.D., explains the emerging research on drug treatments for gambling disorders.

[i] The classification and terminology of pathological gambling will change when the fifth edition of the DSM is published in May 2013. For an outline of proposed changes to the diagnosis of pathological gambling, download the NCRG's white paper, "The Evolving Definition of Pathological Gambling: Proposed Changes for the DSM-5," at www.ncrg.org.

About the author…

Christine Reilly is senior research director of the National Center for Responsible Gaming (NCRG), where she administers the NCRG's research grants program and coordinates educational activities such as the annual NCRG Conference on Gambling and Addiction and *EMERGE (Executive, Management, and Employee Responsible Gaming Education)*. Prior to joining the staff of the NCRG in 1997, Reilly served as executive director of the Missouri Humanities Council for eight years.

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RESEARCH SUMMARY

Psychological and Neurobiological Factors in the Development of Gambling Disorders

by Nathan Smith
National Center for Responsible Gaming

At its core, addiction is a relationship between a vulnerable person and an object of addiction,[1] and, like all relationships, the unhealthy connection between person and object does not occur in a vacuum. Rather, there are many factors that influence the way that any given individual interacts with an object of addiction. For experienced treatment providers, some of these influences may seem obvious, such as a person turning to alcohol to escape from a recent trauma. But often the many influences on addiction are complex and may be difficult to identify. In this chapter we will examine some of the biological, psychological, social and ecological factors that influence the development of a gambling disorder.

HIGHLIGHTS

- An addiction is a relationship between a vulnerable person and an object of addiction, and many factors influence that relationship.
- According to the syndrome model of addiction, researchers explain that there are shared neurobiological, psychological and social risk factors that influence the development and maintenance of an addictive disorder.
- A complex system of neurotransmitters are responsible for our thoughts, feelings and actions. Imbalances within this system can influence both behavioral and substance addictions.
- Environmental factors also can impact whether or not a person develops an addictive disorder, from traumatic and stressful events to other life changes, such as adolescence or menopause.

ADDICTION AS SYNDROME MODEL

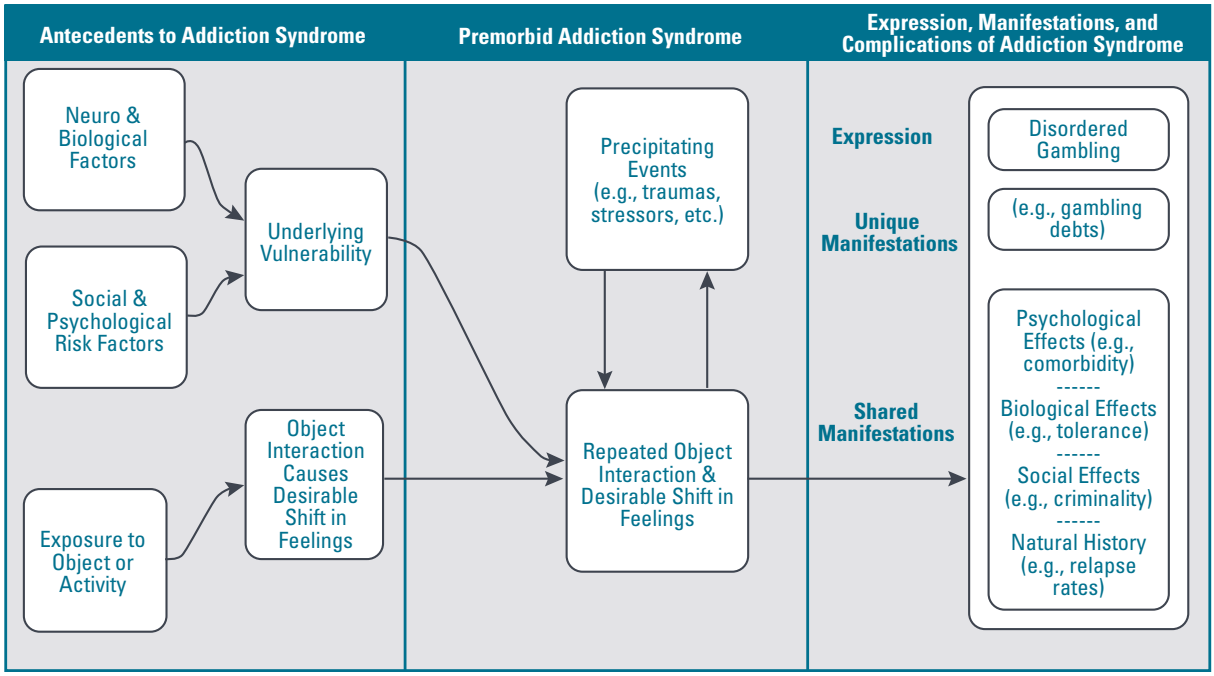
To understand the development of a gambling disorder, it is helpful to examine the latest thinking on the nature of addiction — the "syndrome model" of addiction.[2] The syndrome model was developed by Howard J. Shaffer and colleagues at Harvard Medical School. According to this model, there are shared neurobiological, psychological and social risk factors that influence the development and maintenance of different manifestations of addiction. The risk factors are similar for both substance-based disorders, including alcoholism and drug dependence, and for behavioral or activity-based addictions such as gambling disorders. One person with a substance use disorder and another with a gambling disorder are experiencing different expressions of the same underlying condition. The syndrome model seeks to explain certain realities that treatment providers have been encountering for years: the fact that addictions often co-occur, phenomena like "addiction hopping" and the fact that addictive disorders with different objects appear to respond to the same treatments.

The diagram on the next page (adapted from [2(p.368)]) demonstrates how the syndrome model traces the progression of an addictive disorder.

The panel on the left shows the combination of risk factors and object exposure (i.e., being exposed to alcohol, drugs or other object of addiction) that precede the addictive disorder.

The central panel shows the interaction of repeated object exposure and precipitating events. Precipitating events can be either positive or negative, such as a job loss or job promotion. It is important to note that both positive and negative events can lead to either more or less disordered behavior, such as a job promotion leading to more workplace stress or a job loss leading to the decision to make positive life changes.[3]

FIGURE 1. The Syndrome Model of Addictive Disorders (adapted from [2])



The right panel shows what manifestations one expression of addictive disorder might cause. In the case of gambling disorders, unique manifestations might be accumulating gambling debts or other financial problems. The individual with a gambling disorder is also likely to have experiences that are common among all addictions such as tolerance or withdrawal.[2] In this way each expression of addiction can be preceded by similar risk factors and object interactions, and can lead to either shared or unique manifestations.

This chapter will follow the diagram by starting with neurological and biological risk factors, move to psychological and social risk factors, then on to object exposure and conclude in the middle panel with a discussion of precipitating events.

NEUROLOGICAL AND BIOLOGICAL RISK FACTORS[i]

Although technological advances in brain imaging, drugs, animal studies and genetics emerged in the late 20th century, the recognition that gambling disorders have a neurobiological component pre-dates these advances. Both scientists and clinicians have previously observed that people diagnosed with pathological gambling (PG) experience negative biological consequences.[5] For example, just like individuals with drug dependence who develop tolerance for the drug and, therefore, need higher doses of the drug to experience the desired mood or feeling, those with gambling problems might find that they need to gamble increasing amounts of money to achieve the same level of excitement experienced at lower levels of wagering. When an individual attempts to reduce or stop gambling, he or she might experience symptoms of withdrawal. This process is called neuroadapation and refers to changes in the structure and function of the

[i]This section was adapted from the article titled "Neurobiology and Pathological Gambling" by Jon E. Grant, M.D., J.D., M.P.H., University of Chicago, in the sixth edition of the NCRG's *Increasing the Odds* series.[4]

brain. Among others, this discovery led researchers to further investigate the various aspects of the neurological and biological factors that predispose a person to developing a gambling problem.

Genetic Vulnerability

Research has shown that vulnerability for a number of psychological disorders, including addictive disorders and depression, can be genetically transferred from one generation to the next.[6] Consistently, family studies have demonstrated that pathological gamblers have elevated rates of first-degree relatives — parents, children or siblings — with substance use disorders, suggesting a possible shared genetic vulnerability between PG and other addictions.[7] Studies suggest that both familial factors and shared genetic vulnerability may account for a portion of the development of PG.[8] While it can be difficult to determine how much influence genetics has on the development of an addictive disorder, it is generally understood that genetics and environment work together to influence the growth of the problem.[2]

One of the ways that genetics may influence the development of addictive disorders is through the transmission of underlying imbalances in brain chemistry. One model of this, proposed by Blum and colleagues, is the "reward deficiency syndrome" — a state of chemical imbalance involving multiple genes that causes an individual to crave environmental stimuli to compensate for the inherent imbalance — regardless of the consequences.[9] Blum and colleagues suggested that "reward deficiency syndrome" was affected by the brain chemical dopamine, a neurotransmitter that influences mood and judgment. In this way, genetically determined levels of a brain chemical can influence the development of the addictive syndrome; three of the most important relating to addiction include serotonin, dopamine and endogenous opioids.

Neurotransmitters

Neurotransmitters are chemicals that carry signals to perform the varying functions of the central nervous system. A complex system of neurotransmitters, such as serotonin, dopamine, endogenous opioids and hormones, are responsible for what we feel, how we think and what we do. Imbalances within this system have been shown to influence both behavioral and substance addictions.

Serotonin

Several studies of impulse control disorders have provided evidence of serotonergic dysfunction. Serotonin is implicated in emotion, mood and cognition. As evidenced by findings in separate studies, low levels of serotonin, which have been observed in individuals with PG habits and substance use disorders, may result in increased motivation to satisfy urges, impairment in inhibition and reward processing or a combination of these factors.[10, 11] Consequently, individuals with deficient serotonin levels may have difficulty controlling their impulses.

Dopamine

Dopamine has many functions in the brain, including important roles in behavior and cognition, voluntary movement, motivation, punishment and reward, sleep, mood,

attention, working memory and learning. Individuals with impulse control or substance use disorders have shown alterations within the dopaminergic pathways, causing them to seek rewards (i.e., gambling or drugs) that trigger dopamine release and result in feelings of pleasure, thus reinforcing the problematic behaviors.[9]

Endogenous Opioids

Endogenous opioids are opiate-like substances, such as endorphins, that function as neurotransmitters. They are produced naturally within the body and contribute to feelings of well-being and lessen feelings of pain (e.g., when physical exercise leads to positive feelings because of increased levels of endorphins). Research on the neurobiology of addiction has demonstrated that individuals with altered opioidergic systems might have greater difficulty controlling desires to continue an addictive behavior due to intense euphoric feelings experienced after engaging in rewarding behaviors. Clinical studies demonstrating the efficacy of drugs known as opioid antagonists — naltrexone and nalmefene, which prevent the body from responding to opiates and endorphins by blocking receptors — have further substantiated involvement of opioids in both behavioral and substance addictions.[12–16] (For a more extensive description of these drugs, see the chapter titled "Pharmacological Approaches to Treating Pathological Gambling" on page 52.)

Brain Imaging

How do we know so much about the brain? Technological advances in brain imaging, such as functional magnetic resonance imaging (fMRI), have enabled scientists to measure brain activity by detecting associated changes in blood flow. Existing evidence from neuroimaging studies suggests similarities between behavioral and substance addictions, as indicated by abnormal function (i.e., decreased activation) of the ventromedial prefrontal cortex of the brain, which is the section involved in decision-making.[17,18] A Massachusetts General Hospital study used fMRI to show that an incentive unique to humans — money — produced patterns of brain activity that closely resembled patterns seen previously in response to other types of rewards. This similarity suggests that common brain circuitry is used for various types of rewards[19]

PSYCHOLOGICAL AND SOCIAL RISK FACTORS

Co-occurring Disorders

Perhaps the most established fact about gambling disorders is that they are a highly comorbid condition.[20] Research indicates that most people who have a gambling disorder also have one or more additional mental health problems. This fact has always been apparent to clinicians who know, for example, that clients with bipolar disorder may gamble excessively during a manic phase and develop a gambling problem. (The *DSM-IV* diagnosis for PG acknowledges that a manic phase might be responsible for excessive gambling.) The largest study that examined the comorbidity of PG surveyed more than 43,000 representative Americans and concluded that almost 75 percent of those diagnosed with PG had a co-occurring alcohol use disorder, while almost 40 percent had a comorbid drug use disorder.[21] These findings are not surprising given the syndrome model of addiction. In fact, the high rate of co-occurring disorders among all addictive disorders is strong evidence for the syndrome model.

> "The largest study that has examined the comorbidity of PG concluded that almost 75 percent of those diagnosed with PG had a co-occuring disorder."

Gambling disorders are also highly comorbid with other common psychological conditions. The study referenced above also found that people with gambling disorders had very high rates of personality disorders (more than 60 percent), mood disorders (almost 50 percent) and anxiety disorders (more than 40 percent).[21] The fact that so many people with gambling disorders have other mental health conditions raises the question of which disorder occurs first. Is it that problematic gambling behavior is an outcome of some other previously existing condition, such as a depressed person turning to gambling as a means of escape? Or, perhaps a person suffers financial and relationship problems as a result of excessive gambling and consequently develops depression. One study that examined the behavior of almost 10,000 representative Americans found that about 25 percent of the time the gambling disorder occurred before the onset of the other disorder, and about 75 percent of the time the gambling disorder occurred after another disorder was already present.[20] Although the question of which comes first — the gambling problem or the co-occurring disorder — will need corroboration from future studies, the connection between gambling disorders and other comorbid psychological disorders is clear. It is, therefore, vital for clinicians to assess clients who have gambling problems for other psychiatric and addictive disorders.

Demographics

Like other expressions of addiction, gambling disorders are correlated with certain demographic characteristics. Several studies have found that having a gambling disorder is associated with being young, male, non-white and divorced or separated.[22] One finding of note related to race is that African-Americans are significantly less likely to engage in gambling than Caucasian Americans but significantly more likely to have a gambling disorder.[20] There is also some evidence that certain demographic variables may occur in clusters, a factor that may cause studies that look at individual characteristics in large populations to miss some relationships.[22] For example, a young, male sports bettor may be at greater risk for developing a gambling problem than a person who is young or male or a sports bettor. Further research will be needed to find and validate clustering patterns of demographic data such as this.

Environment

There are also environmental factors that impact whether or not a person develops an addictive disorder, and even what type of addictive disorder they might develop. Environment is made up of several factors: exposure to objects of addiction, social acceptance, lifestyle and culture.[3] Social acceptance can either encourage or mitigate the development of a disorder. Strong social acceptance from one's family can be a protective factor against many psychological disorders. However, being in a place where alcohol and other drug use are socially acceptable, like certain college settings, can increase use and, potentially, the development of disordered behavior. A parallel factor to social acceptance is lifestyle. Lifestyle factors include employment or living situations that encourage or

"About 80 percent of Americans gamble each year, and only about 1 percent of the U.S. population are pathological gamblers."

discourage disordered behavior. For example working at a bar might encourage alcohol use while living in a monastery might discourage it.[3]

Culture can also influence factors related to developing a gambling disorder. Willingness to seek treatment, feelings of social isolation and the receipt of credit or blame are all culturally bound phenomena that can influence the development and maintenance of addictive behavior.[3] For example, gambling is a popular pastime in some Asian cultures, which may lead to more exposure to gambling in general, even at a young age. These factors might contribute to higher rates of disorder in these particular communities.[23] These complex factors are not well understood, and more research is needed to unravel these relationships.

EXPOSURE TO OBJECT OR ACTIVITY

One of the two key variables shown in the left panel of the syndrome model diagram is exposure to an object of addiction. It may seem obvious that exposure is necessary for addiction but it is important to remember that exposure is necessary for addiction but not *sufficient*.[2] If exposure was all that was necessary for a gambling addiction, everyone who ever used a slot machine or played cards for money would become addicted, and we know that this is not the case. About 80 percent of Americans gamble each year,[24] and only about 1 percent of the U.S. population are pathological gamblers.[20] That said, exposure to an object of addiction at a young age or exposure to a parent's addiction could both increase the likelihood of developing an addiction. One recent study found that children of pathological gamblers were four times more likely to develop the disorder.[25] It is difficult to know how much of this increased vulnerability is due to genetic or environmental factors, but it is likely that both factors work together to increase the likelihood of developing a gambling disorder. For this reason, it is important for a mental health professional to understand their client's family history.

PRECIPITATING EVENTS

Trauma and Stressors

Trauma has been shown to have a strong influence on addictive behaviors. Traumas are relatively common in America, experienced by almost half of the population,[3] and trauma-related conditions, such as post-traumatic stress disorder (PTSD), are known to be associated with higher rates of all types of addictive behaviors. Traumas can include natural disasters, violence, physical or sexual abuse, terrorism events or serious accidents.[3] In addition to discrete traumatic events, evidence also shows that other negative events, such as divorce or marital separation, may be associated with problem behaviors. Although not technically traumatic, these negative events do influence the development of the disorder. In fact, divorce or marital separation has been found to correlate significantly with gambling disorders as discussed in the demographics section above. There are many other non-traumatic life experiences that can cause stress either acutely, as with a job loss, or over a long period of time, such as discrimination related to race, gender or sexuality.[3] It is also important to remember that traumas and stressors can

interrelate and amplify each other. For example, a veteran who suffered a trauma in a combat situation may have a hard time finding a job, which in turn can lead to greater strain on family relationships, increase stress even more and can lead to further traumas and stressors.

Physical and Emotional Precipitants

It is easy to understand how traumatic and stressful events can influence addiction, but, as many clinicians have observed, equally important is the influence of seemingly more mundane events. Natural physical changes, such as adolescence or menopause, may influence the development of an addictive disorder, and events like illness or surgery may cause a person to come into contact with objects of addiction they had never experienced (such as opioids for pain management).[3] These natural physical occurrences are often accompanied by strong emotions. It is normal for an individual to experience intense emotions during many life-changing events, but it is not uncommon for these strong emotions to influence the development of disordered behavior. For example, high levels of emotional arousal have been linked to the urge to gamble and to gambling disorders.[26] Finally, it is important to note that negative events are not the only triggers for addictive disorders.[3] Many positive life events are associated with stress, transition and intense emotions. For example, a promotion may lead to a more stressful work environment, and an upcoming marriage can lead to financial and relational strains in a family. All of these examples are just a few of the many physical and emotional experiences that can influence the development of a gambling disorder.

CONCLUSIONS

This chapter describes the many biochemical, psychological, social and environmental experiences that can influence the development of an addictive disorder by either increasing or mitigating the associated risks. When several of these elements align at the same time they can produce very high rates of disorder. For example, during the Vietnam War there were alarming rates of opioid use by American soldiers while in Vietnam.[3] This was likely caused by a perfect storm of factors. The soldiers' demographics (primarily young and male), exposure to the object (opioids were readily available) and environment (use was not being restricted by the military) all encouraged high rates of drug use. In addition, the soldiers were experiencing high levels of day-to-day stress and many experienced repeated traumatic events. These factors together led to extremely high rates of substance use. However, when soldiers returned from the war these high rates dropped off across the board.[3, 27] It is likely that dramatic social and environmental changes associated with coming home caused the sudden decrease in use. As this example shows, the influence of biochemical, psychological, social and environmental factors associated with the many expressions of the addictive syndrome are wide-ranging and highly significant.

About the author…

Nathan Smith is the program officer of the National Center for Responsible Gaming (NCRG). He is currently writing his thesis for his master's degree in liberal arts with a concentration in psychology at Harvard University.

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RESEARCH SUMMARY

Youth Gambling: Prevalence, Risk and Protective Factors and Clinical Issues

by Ken C. Winters, Ph.D., and Randy Stinchfield, Ph.D., L.P.
University of Minnesota Medical School

HIGHLIGHTS

- Researchers estimate that between 2 to 7 percent of young people experience a gambling addiction. An estimated 6 to 15 percent of youth have gambling problems that are less severe.
- Studies have concluded that early involvement in gambling is predictive of later gambling problems. Many adult problem gamblers report that they started gambling when they were young.
- Demographic, behavioral and other psychosocial variables are associated with gambling disorders among youth and have been consistently reported across studies: being male, antisocial behavior, alcohol and drug use, parental/familial gambling, academic problems, impulsivity and peer deviance.

Gambling is present in nearly all of North America, and opportunities include lottery, charitable gambling, casinos and racetracks. Youth are exposed to gambling and gambling-related advertisements, such as billboards, lottery sales displays at convenience stores, and pictures of lottery and casino winners in the newspaper. This exposure and the shift in attitudes toward gambling from that of a vice to a socially acceptable activity represent significant societal changes likely to influence the behavior of youth. For example, some youth now celebrate their "coming of age as an adult" birthday by gambling at a casino.

There is a growing body of literature on youth gambling that indicates gambling is a common activity among youth,[1, 2] and there are many reasons to examine the demographics and prevalence of youth gambling. Gambling can be a risky behavior, and young people are naturally drawn to experiment with adult activities. They have a sense of invulnerability and, therefore, some engage in risky behaviors such as excessive gambling without knowing the risks of developing a gambling disorder. In addition, early exposure to gambling is a concern because researchers have concluded that early involvement in gambling is predictive of later gambling problems, and many adult problem gamblers report that they started gambling when they were young.

This chapter will examine the broad scope of this issue, from the psychosocial factors of development of a gambling disorder among youth to research on screens, assessments, treatment and prevention efforts. For the purpose of this paper, we define youth and adolescents as those individuals younger than the age of adulthood for legal gambling, which is typically 18 or 21 years of age for most forms of gambling in most U.S. jurisdictions.

PREVALENCE OF GAMBLING AND GAMBLING DISORDERS AMONG YOUTH

To fully understand how many youth gamble and how frequently they play, it is important to look to one of the few monitoring studies of youth gambling behavior: the Minnesota Student Survey, which has been conducted since 1992. Because boys have higher rates of participation in gambling than girls, it is important to report on each gender separately. The most recent rates of gambling among youth show that about 60 percent of boys and 30 percent of girls have gambled at least once in the past year.[3]

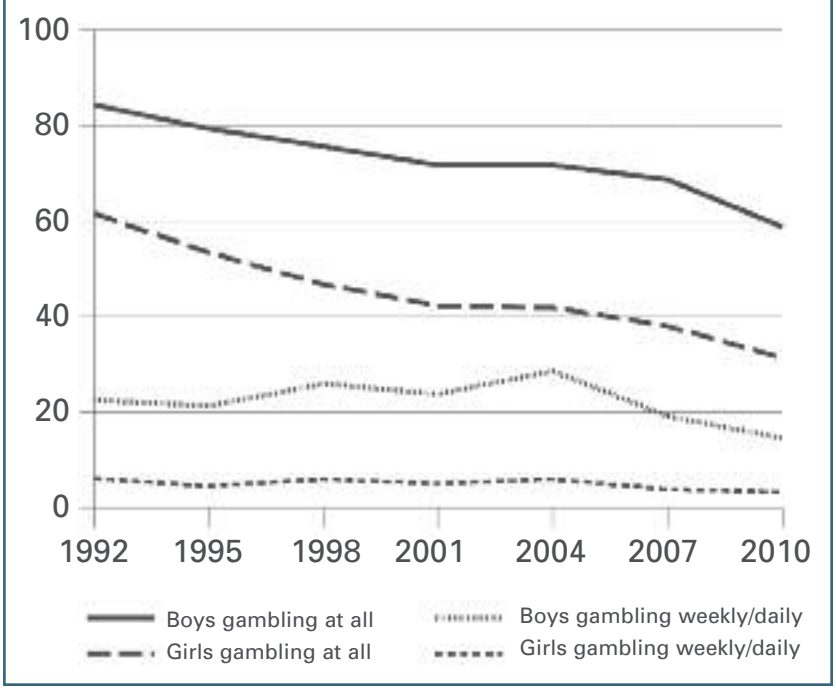
How many youth gamble regularly or frequently, that is, at least once a week in the past year? Rates of regular or frequent gambling vary from as low as 4 percent for Minnesota girls in 2007 to as high as 29 percent of Minnesota boys in 2004 at the peak of the poker playing fad.[3] The most recent findings suggest about 4 percent of girls and 15 percent of boys gamble at least once a week.

The Minnesota survey offers a unique profile of youth gambling in the U.S. It found that nearly 50 percent of ninth-grade boys and 25 percent of ninth-grade girls gambled in the past year.[3] Nearly 75 percent of 12th-grade boys and nearly 50 percent of 12th-grade girls gambled in the past year. More boys gambled than girls, and more 12th-grade students gambled than ninth-grade students. More boys were frequent gamblers (weekly or daily) than girls. The games played frequently by ninth-grade boys were informal games of personal skill, cards, and sports betting. Very few played the lottery, gambled in a casino or gambled online frequently. For 12th-grade boys, the games played most often were lottery games, cards, games of personal skill and games at a casino. (Minnesota has casinos operated by Tribal casinos whose age limit is 18 years old.) There appears to be a shift from informal games to legalized games as boys get older. Nevertheless, it was still a small percentage of 12th-grade boys that gambled in a casino (6.6 percent) or gambled online (3 percent) frequently.

Very few girls gambled frequently. The lottery was the game played most frequently, and that was only played frequently by 3 percent of 12th-grade girls. All the other games were played frequently by about 1 percent or less. Only a small percentage of 12th-grade girls gambled in a casino or gambled online frequently. A larger proportion of older students gambled more frequently than younger students on most games.

The Minnesota study also shows that rates of gambling participation have gradually and consistently declined since it first measured gambling behavior in 1992, two years after the onset of the state lottery and widespread casino gambling across the state.[3] While all games showed declines over time, some games showed larger declines than others. For example, among ninth-grade girls, lottery play has declined much more than playing cards. Rates of frequent gambling have stayed relatively stable from 1992 to 2010 with three exceptions. There was a peak in frequent play of the lottery by 12th-grade students in 1998, a peak in frequent play of cards in 2004 and declines in most games in 2007 and 2010. In 2010, there also was a small percentage of

FIGURE 1. Minnesota Student Survey: Any Gambling and Frequent Gambling (Weekly/Daily) for Boys and Girls

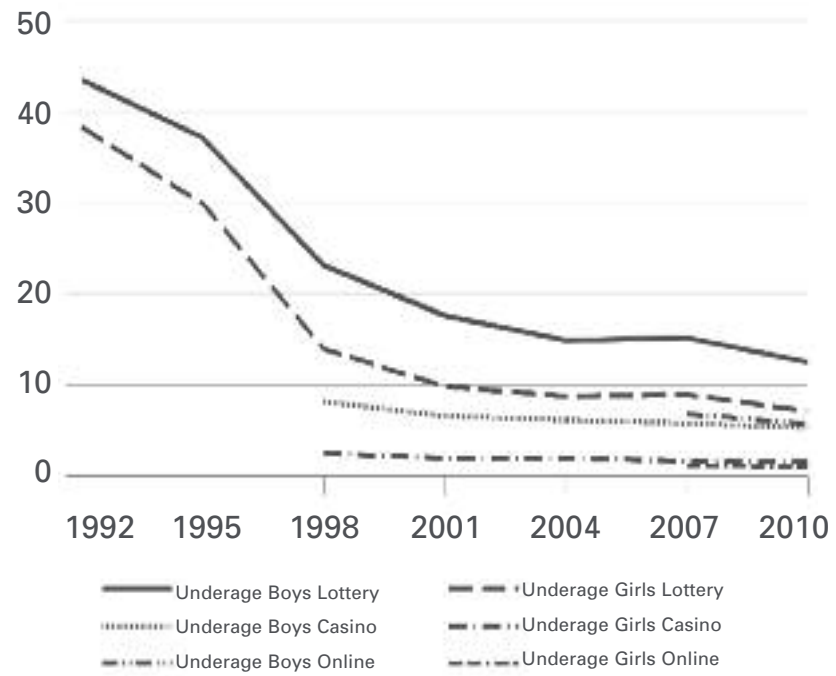


underage youth who reported playing the lottery, gambling in a casino and gambling online. There has been a significant decline in underage play of the lottery from 1992 to 2010 and also downward trends in underage casino play from 1998 to 2010. Figure 1 shows there were fewer students gambling in 2010 than were gambling in 1992, and rates of frequent gambling have remained fairly stable with modest declines from 2004 to 2010.

Gambling for most youth is an infrequent and inconsequential pastime. For some, it is part of the normal adolescent experimentation with adult behaviors and may be considered a rite of passage into adulthood in that youth of legal age tend to shift their gambling participation away from informal games. Nevertheless, there remains a small segment of the youth population that appears to gamble frequently and experience problems associated with their gambling, and these youth will likely need prevention and intervention services.

How many underage youth play specific forms of gambling? Underage lottery, casino and online gambling rates for boys and girls from 1992 to 2010 are shown in Figure 2. While most underage youth do not play legalized games, there is a small percentage that does participate. More boys engage in underage gambling than girls, and there was a relatively high rate of underage lottery play by boys and girls starting in 1992; however, there has been a consistent and gradual decline from 1992 to 2010. Underage casino gambling showed modest declines from 1998 to 2010. Online gambling was measured in 2007 and 2010 and showed a significant decline for boys and relative stability for girls at about 1 percent.

FIGURE 2. Minnesota Student Survey: Percent of Underage Lottery, Casino and Online Gambling



PROBLEM GAMBLING AMONG YOUTH

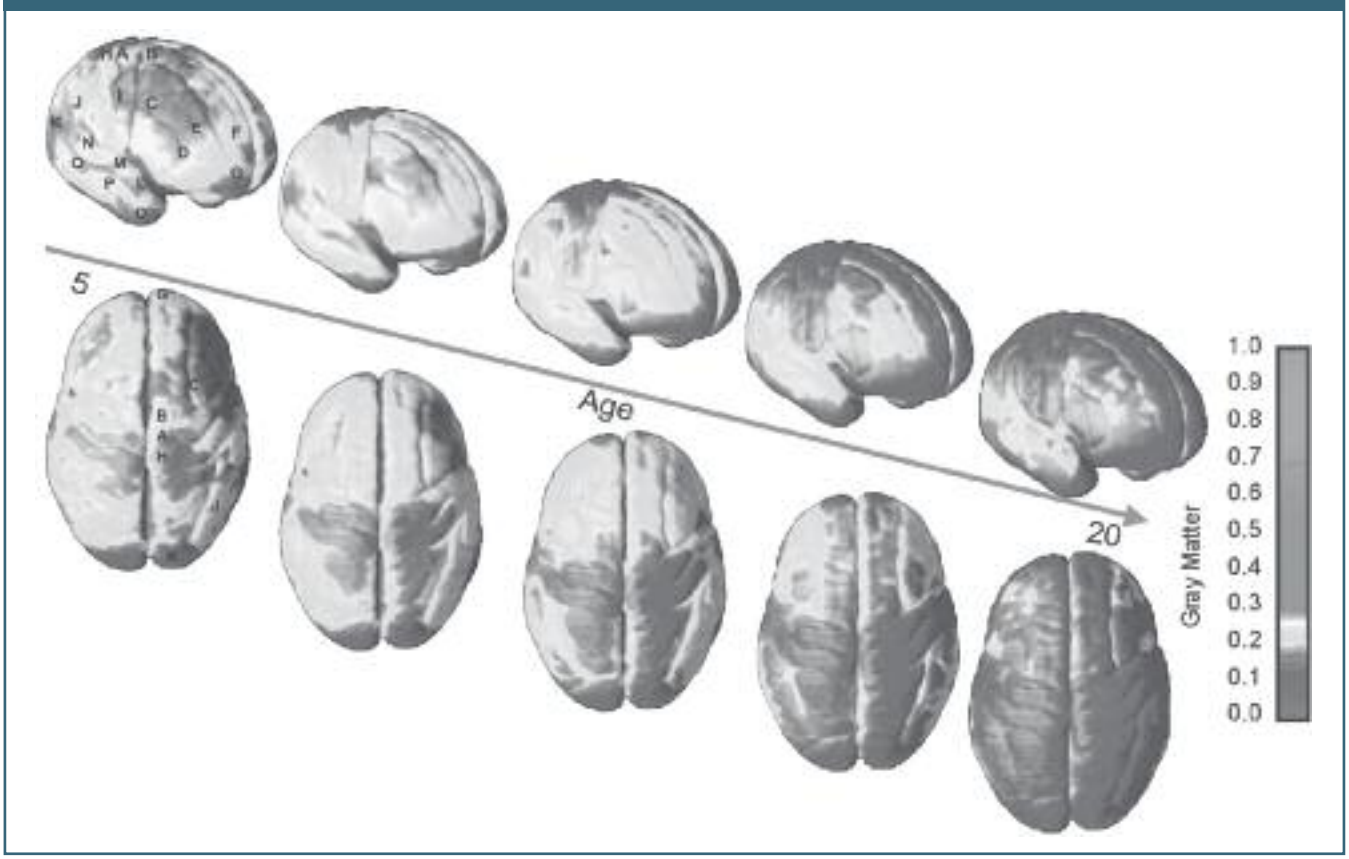
What percentage of youth are problem gamblers? Rates of problem gambling vary from as low as 1 percent in a U.S. national survey in 2006[4] to as high as 6 percent in Louisiana in 1998.[5] It can be assumed that between 2 to 7 percent of young people experience a gambling addiction, compared to about 1 percent of adults. An estimated 6 to 15 percent of youth have gambling problems that are less severe, while 2 to 3 percent of adults fall into that category. The variance in rates of problem gambling is largely due to methodological differences such as instruments and cut scores used, method of administration and sampling methods.

VULNERABILITY FACTORS

Brain Development

What role does the brain play in problem gambling? One emerging view is that adolescent vulnerability to addictive behaviors, including problem gambling, is significantly influenced by the way their brain is growing. Clinical and research data support the position that adolescence is a critical neurobiological development period that is associated with a greater vulnerability for impulsive decision-making and greater likelihood of indulging in addictive behaviors. This vulnerability is supported by recent brain imaging data indicating that the region of the brain that monitors impulse and motivation, the frontal cortex, isn't fully formed during adolescence (see Figure 3). These maturational changes in the frontal cortical region may give rise to a transitional tendency for the adolescent to bias decision making toward risk-seeking choices.[6] These developmental processes may advantageously promote adaptation to adult roles, but may also confer greater vulnerability to potentially addictive behaviors.[7]

FIGURE 3. Gray Matter Maturation
(Gogtay et al., Proceedings of the National Academy of Sciences, 2004)



Psychosocial Factors

A number of demographic, behavioral and other psychosocial variables associated with youth gambling disorders have consistently been reported across studies. These variables include being male, antisocial behavior, alcohol, drug and tobacco use, parental/familial gambling, academic problems, impulsivity, peer deviance and early onset of gambling, to name the most common.[8, 2] These variables may play a role in the development and/or maintenance of gambling behavior and disorder. Studies indicate that problematic gambling behaviors may be part of a constellation of issues that are mainly exhibited by males, including frequent alcohol use, tobacco use, drug use and antisocial behavior. These studies also indicate that youth are typically involved in multiple risky behaviors, such as cigarette smoking, alcohol use, drug use and pathological gambling (PG).

Identifying Vulnerability Factors

It is important to know what variables may be associated with gambling disorders among youth. First, correlates can tell us what characteristics young problem or disordered gamblers are likely to exhibit, and this information can help us understand the causes of youth gambling disorders.

Second, correlates can help identify those with a potential gambling disorder by providing signs to look for, such as particular behaviors that co-occur with pathological gambling. Parents, teachers and others who work with youth want to know what warning signs to look for. Warning signs are very important for what has been described as an "invisible addiction." For example, you cannot smell blackjack on a gambler's breath but you can find lottery tickets in their bedroom or school bag. Young people, like adults, attempt to conceal their gambling problems, and, therefore, warning signs are very important for the identification of the problem.

Third, correlates can tell us what variables may be risk and protective factors for the disorder. Risk factors are those variables that are associated with the development of the disorder and increase the severity and duration of the disorder. Protective factors are those variables that enhance the individual's ability to overcome the effects of risk factors and the disorder. Some correlates may provide insight into protective factors that prevent the development of a gambling disorder. For example, if school failure is associated with problem gambling, school success may serve as a protective factor. Prevention has been defined as an effort to avoid the onset of a particular problem behavior and to promote positive behavioral outcomes.[9] A good deal of research has shown that risk and protective factors and their interaction are helpful for understanding the psychopathology of addiction.[10]

Fourth, correlates can assist in developing prevention programs. Specific risk and protective factors can be the focus of prevention efforts and can be tailored to specific types of youth. Risk factors can be minimized or avoided, and protective factors can be enhanced or developed. Youth who already gamble excessively will need a different prevention approach than youth who are non-gamblers or who are social or recreational gamblers. For example, some youth may only need information about how games of chance work in order to combat common cognitive distortions about gambling. Others may benefit from guidelines on how to set money and time limitations on their gambling

to avoid putting themselves at risk of losing more money than they can afford. Young people who already exhibit signs of a gambling disorder may need treatment services.

YOUTH GAMBLING ASSESSMENT

For adolescents, gambling is viewed as an adult activity that they can participate in fairly easily, such as playing poker for money with their friends, and without upsetting their parents. As mentioned previously, gambling behavior among adolescents includes a continuum of no gambling, experimentation with gambling, occasional or regular social gambling and excessive and problematic gambling. PG is defined in the *DSM-IV* as persistent and recurrent maladaptive gambling behavior that disrupts one's life as evidenced by five or more of the DSM diagnostic criteria (For the *DSM-IV* criteria, see the introduction to this monograph on page 2).

Adolescents can exhibit PG or gambling addiction, but experts argue that the signs and symptoms are displayed in a manner different than adults. For example, an adult with a gambling disorder may be absent from work in order to gamble, whereas an adolescent may be absent from school in order to gamble. An adult may lie to his or her spouse about gambling, whereas an adolescent may lie to his or her parents about gambling. An adult may spend his or her paycheck on gambling when the money is supposed to pay for food and housing, whereas an adolescent may wager his or her pocket money or their iPod or video game player. Adolescent gamblers cannot lose their house, or spouse or family, or file for bankruptcy, but they can exhibit adolescent-specific adverse consequences.

A small number of problem gambling assessment instruments for youth have been developed and many are adaptations of adult instruments. There are four commonly used youth problem gambling instruments:

- South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA)
- DSM-IV-Juvenile (DSM-IV-J) and the related DSM-IV-Multiple Response-Juvenile (DSM-IV-MR-J)
- Massachusetts Gambling Screen (MAGS)
- Canadian Adolescent Gambling Inventory (CAGI)

Three of these four instruments are adaptations of adult instruments. To view the full information on the adult measurements, please see page 22. More details of each of these four instruments are provided below and summarized in Table 1.

South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA)

Introduction: Winters, Stinchfield and Fulkerson[11] adapted the most commonly used adult instrument, the South Oaks Gambling Screen (SOGS), for adolescents and named it the SOGS-Revised for Adolescents or SOGS-RA.

Adaptation: The investigators revised the SOGS by changing the lifetime time frame to only study the gamblers' past 12 months. This approach seemed more developmentally appropriate for adolescents since they do not have as much life experience as adults and tend to live more in the present than adults. Other revisions included changing the wording of items and response options to better reflect adolescent gambling behavior and

youth reading levels, eliminating two items that were viewed as having poor content validity for adolescents; and having only one item for sources of borrowed money rather than nine items as is done with the SOGS.

Items: The SOGS-RA consists of 12 items. Each item is given a value of one point summed for a total score that ranges from 0 to 12. A cut score of 4 or more indicates a problem gambler, a score of 2 to 3 indicates an at-risk gambler and a score of 0 to 1 indicates a gambler who does not have a problem.[12] A copy of the SOGS-RA as well as a detailed description of the revisions can be found in a paper by Winters, Stinchfield and Fulkerson.[11]

DSM-IV-J and DSM-IV-MR-J (J=Juvenile) (MR=Multiple Response)

Introduction: Fisher[13] developed a 12-item questionnaire to measure nine of 10 *DSM-IV* diagnostic criteria of PG in juvenile fruit machine players in Britain, the first adaptation of *DSM-IV* criteria for youth.

Adaptation: The DSM-IV-J response options are "yes" or "no." The DSM-IV-J has been used in a number of studies around the world to measure problem gambling among adolescents, including Britain[14-17], Spain[18] and Canada.[19,20] The DSM-IV-J has been revised by changing the phrase "playing fruit machines" to "gambling" and by incorporating multiple response options into the DSM-IV-MR-J.[21]

Items: The DSM-IV-MR-J also has 12 items to measure nine of the 10 *DSM-IV* criteria, and the items are adapted from the *DSM-IV* criteria to reflect the developmental stage of youth. The author simplified the language and omitted details that were less relevant for youth, as well as excluding criterion 10, because "young problem gamblers tend to resolve desperate financial situations caused by gambling by illegal methods."[21(p.258)] Most of the 12 items have four response options: never; once or twice; sometimes; and often. Fisher[21] has a scoring system for the set of response options for each item to match the nine *DSM-IV* criteria. The score range is from 0 to 9 and a score of 4 or more is classified as a pathological gambler.

Massachusetts Gambling Screen (MAGS)

Introduction: Shaffer, LaBrie, Scanlan, and Cummings[22] developed the Massachusetts Gambling Screen (MAGS), a seven-item screening instrument. It was designed to measure the gambling problems of excessive gamblers and to obtain an estimate of the prevalence of a gambling disorder. The MAGS was developed in 1993 on a sample of 589 Boston high school students who had gambled in the past year.

Adaptation: The MAGS includes 14 items adapted from the Short Michigan Alcoholism Screening Test (SMAST), an alcoholism screen developed by Selzer, Vonokur and van Rooijen.[23]

Items: Each item is assigned a 0 for a "no" response and a 1 for a "yes" response. Scoring is based on item weights that are multiplied by each item score and summed, along with a constant. The MAGS classifies respondents into three categories: (a) non-PG, (b) transitional gambling or (c) PG.

Canadian Adolescent Gambling Inventory (CAGI)

Introduction: The most recent adolescent instrument to be developed is the Canadian Adolescent Gambling Inventory (CAGI).[24] Rather than revise an adult instrument, the CAGI was developed to create a scale specifically for adolescents that would measure a continuum of gambling problem severity from low to high, rather than items that tap into high problem severity alone. The CAGI measures the two main elements of youth gambling: the gambling behavior itself and negative consequences of gambling.

Items: The 44-item paper-and-pencil questionnaire can be administered in 20 minutes. The CAGI measures frequency and time for 19 types of gambling and two items on money/items of value lost to gambling. The CAGI uses a past three-month time frame to match an adolescent's focus on recent activities rather than the distant past, particularly since adolescence is a time of rapid changes and development. The CAGI measures five gambling content domains: types of gambling activities played; frequency of participation for each gambling activity; time spent gambling on each activity; money spent gambling; and gambling risk and harm. The score range for the nine-item Gambling Problem Severity Scale (GPSS) is 0 to 27. Scores are interpreted as follows: 0 to 1 indicates no problem; 2 to 5 indicates low to moderate severity; and 6 or more indicates high severity. The four other subscales are interpreted with percentiles based on large school samples.[24] The CAGI moves beyond a single, simple scale to the measurement of more complex, multiple domains of gambling risk and harm.

TREATMENT OF YOUTH WITH GAMBLING DISORDERS

As discussed above, estimates of youth problem gambling indicate that rates are higher than for adults. Despite this finding, there are no known treatment programs for adolescent gambling disorders.[25] Moreover, experts in the field find that adolescents rarely present themselves for treatment services. For example, the Minnesota problem gambling treatment database that tracks intakes and admissions for state-funded programs has not included a single adolescent, and only a handful of young adults (19 to 24 years of age) have been admitted into any programs.

"…estimates of youth problem gambling indicate that rates are higher than adults… experts in the field find that adolescents rarely present themselves for treatment services."

Why is this the case? A number of explanations are under debate among researchers. First, there is the argument that youth problem gambling rates are inflated because typical measures do not adequately measure the severity and intensity of symptoms of a gambling disorder. Thus, there is still much work to be done to improve the validity of adolescent screening and comprehensive instruments to address gambling disorders.

The second issue raised is that youth are not likely to seek treatment of a gambling disorder, much less other behavioral problems that are more prevalent among this age group. Several factors may adversely affect the process of an adolescent receiving treatment for a behavioral or psychiatric condition, including diminished influence from external sources that serve to encourage an individual to seek treatment and poor insight about the need for help, perhaps resulting from developmental immaturity. It is relevant to place the present argument within the context of adult problem gambling. Many of the

TABLE 1. Description of Instruments

Name of Instrument (year)	Content Areas	Items: number, response options and time frame	Administration Time and Method	Scoring: instructions, score range, cut-scores and interpretation of scores
SOGS-RA (1990)	Signs and symptoms of a gambling disorder; negative consequences of PG	12 items; "yes/no" response option; past year time frame	10-minute paper and pencil questionnaire	Each item is one point; score range 0 to 12; score of 0 to 1 = no problem; score of 2 to 3 = at risk gambling; score of 4 or more = problem gambling.
DSM-IV-J and DSM-IV-MR-J (1992; 2000)	*DSM-IV* diagnostic criteria	Nine criteria measured by 12 items; "yes/no" (DSM-IV-J) and multiple response options (DSM-IV-MR-J); past year time frame	Five to 10-minute paper-and-pencil questionnaire	Each item is one point; score range is 0 to 9; score of 4 or more is classified as a problem gambler.
MAGS (1994)	Psychological and social problems associated with gambling disorders	14 items; seven items are scored in a scale based on item weights from a discriminant function analysis; "yes/no" response options; past year time frame	Five to 10-minute interview or paper-and-pencil questionnaire	Each item is scored 0 for no and 1 for yes. Each item score is multiplied by a weight and then summed along with a constant using a weighted scoring algorithm derived from a discriminant function analysis. The MAGS classifies respondents into non-PG, transitional gambling or PG.
CAGI (2010)	Gambling frequency, time and money spent gambling and gambling problem severity (behaviors and consequences)	44 items measuring five scales (gambling problem severity, loss of control, psychological, social and financial consequences); four-point multiple response options; past three months time frame	20-minute paper-and-pencil questionnaire	This nine-item gambling problem severity subscale has a score range of 0 to 27. Score of 0 to 1 indicates no problem; score of 2 to 5 indicates low to moderate problem severity; score of 6 or more indicates high severity.

potential barriers for youth to seeking treatment are also relevant to adults, and yet a percentage of adults with gambling disorders do seek treatment.[26]

Third, there are only a few gambling treatment programs in the United States[27] and the present authors are not aware of any that focus on youth. This lack of services may further discourage individuals from seeking help for this problem and parents not recognizing that pathological and problem gambling can be serious behavioral disorders.

PREVENTING YOUTH GAMBLING

Primary prevention programs and curriculum have been developed in an effort to protect youth from the negative consequences of problem gambling.[28] These approaches have

fallen into two camps, either abstinence or harm reduction.[25] One approach seeks to encourage youth to delay the age of onset of gambling until the legal age permitted for gambling. This approach is based on the notion that if gambling occurs during the teenage years, the likelihood of eventually developing a gambling problem increases significantly.[8]

Another strategy is the harm reduction approach. This attempt promotes responsible gambling behavior by enhancing impulse-control skills and educating youth about the risks of gambling, including a basic understanding of the underlying mathematical probabilities associated with games of chance (e.g., *Facing the Odds: The Mathematics of Gambling and Other Risks*[29]). This approach may also address the cognitive distortions and misperceptions that youth may have about gambling, such as a belief that they are "lucky" and therefore can win money gambling.

Some programs are taking a broader approach. One example is the program from the International Centre for Youth Gambling Problems and High-Risk Behaviors that targets a number of related high-risk behaviors such as tobacco use, alcohol use, drug use, along with gambling.[30] Another example is CollegeGambling.org, an online resource from the National Center for Responsible Gaming (NCRG) that addresses the problem from a multi-dimensional, ecological perspective in which prevention components include health policies and practices and direct prevention and intervention services.

We know of only one prevention program that has been empirically evaluated and published in a peer-reviewed journal. Gaboury and Ladouceur[31] administered a primary prevention program consisting of three sessions to approximately 300 high school students (there was no control group). Organized around an alcohol prevention model, the program provided education about the odds of winning, myths and beliefs of gambling and risks of gambling. At a six-month follow-up session, the students reported increased knowledge about the risks of gambling, but there were no changes in gambling behavior.[31]

SUMMARY

Gambling is a relatively common leisure activity for adolescents, and young people have always been attracted to gambling.[32] The debate continues on public health implications of problem gambling for this age group.[2,33] We have explored the literature on reported rates of youth gambling involvement, including rates of gambling disorders. Several studies indicate that the prevalence of gambling disorders are is higher among youth compared to adults, although more research on the validity of adolescent gambling measures are needed to further clarify the public health significance of adolescent problem gambling. The personal and environmental risk factors associated with adolescent problem gambling are congruent with those antecedent factors involving impaired self-regulatory functions and linked with many other problem behaviors of youth, including drug abuse, delinquency and early sexual behavior. From a developmental perspective, the authors view low-end gambling involvement as a normal part of adolescent development and severe-end gambling as reflecting a combination of self-regulatory deficits and environmental factors (e.g., easy access to gambling). The dynamic influences of person and environment factors on the etiology of adolescent problem gambling will require continued research inquiry.

About the authors…

Ken C. Winters, Ph.D., is professor of psychiatry at the University of Minnesota Medical School and is senior scientist at the Treatment Research Institute in Philadelphia, Pa. His research interests include assessment and treatment of adolescent drug abuse and gambling; adolescent brain development and vulnerability to drug abuse; and assessment and treatment of adult problem gambling.

Randy Stinchfield, Ph.D., L.P., is a licensed clinical psychologist and associate director of the Center for Adolescent Substance Abuse Research in the department of psychiatry at the University of Minnesota Medical School. Starting in 1989, Dr. Stinchfield began a program of research on gambling, including youth gambling, gambling assessment and the evaluation of gambling treatment.

DISCLOSURE

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RESEARCH SUMMARY

Screening and Assessment of Problem and Pathological Gambling

By Randy Stinchfield, Ph.D., L.P.
University of Minnesota Medical School

How do you know if someone has a gambling problem? Can you tell by watching them gamble at a blackjack table or buying a lottery ticket? The answer is no; you cannot identify a gambling disorder just by observing how much money or how much time a person spends gambling. While these behaviors are correlated with pathological gambling (PG), they are not diagnostic indicators because there are people who spend large amounts of money and time gambling but do not demonstrate at least five of the 10 criteria set forth by the *DSM-IV*. (See page 2 for the full *DSM-IV* criteria list.)

HIGHLIGHTS

- Mental health care providers need to be able to accurately screen for and diagnose PG in order to provide appropriate referral and treatment services. This is important when treating clients for co-occurring disorders, such as substance use.
- The brief screen helps narrow down the number of people who will be referred for the more comprehensive assessment. If someone obtains a positive result on a brief screen, a clinician can also opt to administer assessment instruments that use longer and more comprehensive lists of signs and symptoms of PG.
- For a full list of brief screens and full assessments, see page 34.

PG is often referred to as a "hidden addiction." You cannot smell blackjack on someone's breath, as you can alcohol, but there are signs and symptoms of PG that can be uncovered through screening and assessment. These indicators have parallels to other addictions, and someone who works in the alcohol and drug abuse field will find many similarities between alcohol/drug abuse and PG. For example, the symptom of tolerance is found with both PG and substance use disorders. The disordered gambler needs to bet more money in order to achieve the same "high," similar to the alcoholic who finds the need to drink more alcohol to achieve the same feeling of intoxication that was once achieved with lower amounts of alcohol. Furthermore, there is a significant rate of co-morbidity between PG and substance use disorders where individuals in treatment for an alcohol or drug problem will also have a concurrent gambling disorder.

Mental health care providers need to be able to accurately screen for and diagnose PG in order to provide appropriate referral and treatment services. This requires accurate measures of PG, and instruments have been developed for a variety of purposes, including screening, assessment, diagnosis, treatment planning and treatment outcomes. These screening and assessment instruments range from as few as two items to as many as 100 or more items. The purpose of this paper is to familiarize readers with brief screens and assessment instruments for measuring and diagnosing PG.

HISTORY

PG was first recognized as a disorder in 1980 by the American Psychiatric Association (APA) in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*.[1] Although the APA placed PG in the impulse control disorder section of the

DSM-IV, the diagnostic criteria are very similar to substance use disorders' diagnostic criteria and share a number of signs and symptoms found in substance use disorders, such as tolerance and withdrawal. Instruments that are based on *DSM-IV* diagnostic criteria inquire about consequences of gambling, attempts at controlling one's gambling, and changes in gambling behavior that may indicate tolerance and withdrawal syndromes. Many of the screening and assessment instruments in this review are based on *DSM-IV* diagnostic criteria.

BRIEF PG SCREENS

The purpose of a brief screen is to identify individuals who may have a gambling disorder. There are some settings, particularly those in which time and money for screening are limited, where only a brief screen for PG can be administered. The brief screen helps narrow down the number of people who will be referred for the more time-intensive and costly comprehensive assessment. If someone obtains a positive result on a brief screen — that is, the brief screen indicates a gambling problem — the person should be referred for a more comprehensive PG assessment.

For the purpose of this review, brief screens are defined as those screens consisting of five or fewer items and are listed in the box to the right.

Although these four brief PG screens were each derived from *DSM-IV* diagnostic criteria for PG, each consists of different sets of items or criteria. Also see Table 1 for a description of each screen.

BRIEF SCREENS

- Lie-Bet Screen[2]
- NODS-CLiP[3]
- NODS-PERC[4]
- Brief Biosocial Gambling Screen (BBGS)[5]

INSTRUMENTS

Gamblers Anonymous 20 Questions (GA-20)[6]

South Oaks Gambling Screen (SOGS)[7]

Massachusetts Gambling Screen (MAGS)[8]

Diagnostic Interview for Gambling Schedule (DIGS)[9]

Gambling Treatment Outcome Monitoring System (GAMTOMS)[10]

National Opinion Research Center *DSM-IV* Screen (NODS)[11]

Canadian Problem Gambling Index (CPGI)[12]

Lie-Bet Screen

The two items in the Lie-Bet Screen[2] were chosen from a pool of 12 used to measure the 10 *DSM-IV* diagnostic criteria for PG. This measure of *DSM-IV* diagnostic criteria was administered to 191 male Gamblers Anonymous (GA) members and 171 males without a gambling disorder (i.e., controls[i]) drawn from a pool of U.S. Department of Veterans Affairs employees.

Items: The following items were found to be the best discriminators between these two groups:

1. Have you ever had to lie to people important to you about how much you gambled?
2. Have you ever felt the need to bet more and more money?

While not explicitly stated, the time frame appears to be lifetime, since the items start with the phrase "Have you ever…?" Answering "yes" to one or both items indicates PG.

[i] A controlled experiment separates research participants into two groups: an experimental group and a control group. No treatment is given nor a condition is assigned to the control group. This allows the researchers to compare the two groups and, therefore, measure the effectiveness of the treatment under study. In this case the control group includes people who are unlikely to have the disorder.

Strengths and Limitations: Strengths of this brief screen include brevity of two items with simple "yes/no" response options and a simple scoring algorithm and interpretation. Limitations of the Lie-Bet screen include that it does not reflect an exact paraphrase of the *DSM-IV* criteria upon which it is based. Because it uses a lifetime time frame, another limitation is that is likely to increase false positive rates for current PG. The screen also lacks empirical evidence of classification accuracy from investigators other than the developers and with a criterion other than a measure of *DSM-IV*.

NODS-CLiP

NODS-CLiP,[3] which stands for the National Opinion Research Center Diagnostic Screen for Gambling Disorders, Loss of Control, Lying and Preoccupation screen, is a three-item screen derived from the NODS, a longer measure of the 10 *DSM-IV* diagnostic criteria.[3] The 17-item NODS was administered to a sample of 8,867 participants in eight separate surveys and was seen as the reference standard[ii] to determine group membership as either PG or non-PG. (See the description of the assessment in Table 1).

Items: The authors tested two, three and four-item combinations of NODS items and found that the following three NODS items were the best set to identify PG:

1. Have you ever tried to stop, cut down or control your gambling?
2. Have you ever lied to family members, friends or others about how much you gamble or how much money you lost on gambling?
3. Have there ever been periods lasting 2 weeks or longer when you spent a lot of time thinking about your gambling experiences, or planning out future gambling ventures or bets?

The NODS-CLiP uses a lifetime time frame and can be administered in one minute. Answering "yes" to one or more items is indicative of PG.

Strengths and Limitations: Strengths of the NODS-CLiP include brevity of three items with simple "yes/no" response options; a simple scoring algorithm and interpretation; and the fact that it is based on a measure of *DSM-IV* diagnostic criteria for PG, which has shown evidence of classification accuracy. Limitations of the NODS-CLiP include a lifetime time frame rather than a "current" time frame thus increasing the false positive rate for current PG; a lack of independence between the NODS-CLiP and the full NODS reference standard or criterion upon which the items were selected; and poor performance in a clinical sample.

NODS-PERC

The NODS-PERC,[4] otherwise known as the National Opinion Research Center Diagnostic Screen for Gambling Disorders, Preoccupation, Escape, Risked Relationships and Chasing Screen, is a four-item screen derived from the full NODS.[4] The NODS-PERC was developed in a study of brief interventions for PG at the University of Connecticut Health Center by administering the lifetime and past 12-month time frame NODS instruments to 375 participants. Again, the full NODS was used as the reference standard to determine group membership as either PG or non-PG.

[ii]In science, the reference standard is any method of known validity and reliability which has consensus among investigators and clinicians as the best available method to determine the presence or absence of a disorder against which to compare new tests.

Items: The authors found that the following four NODS items were the best set to identify PG:

1. Have there ever been periods lasting 2 weeks or longer when you spent a lot of time thinking about your gambling experiences or planning out future gambling ventures or bets?
2. Have you ever gambled as a way to escape from personal problems?
3. Has there ever been a period when, if you lost money gambling one day, you would return another day to get even?
4. Has your gambling ever caused serious or repeated problems in your relationships with any of your family members or friends?

The NODS-PERC is intended for use in clinical settings and can be administered in one minute. By using "yes/no" response options, an answer of "yes" to one or more questions indicates the need for further assessment.

Strengths and Limitations: Strengths of the NODS-PERC include brevity of four items with simple yes/no response options, a simple scoring algorithm and interpretation, and that it is based on a measure of *DSM-IV* diagnostic criteria for PG which has shown evidence of classification accuracy. Limitations of the NODS-PERC include a lack of independence between the NODS-PERC and the full NODS reference standard or criterion upon which the items were selected; and use of a lifetime time frame rather than a current time frame thus increasing the false positive rate for current PG.

Brief Biosocial Gambling Screen (BBGS)

The Brief Biosocial Gambling Screen (BBGS)[5] is a three-item screen derived from *DSM-IV* diagnostic criteria for PG as measured in the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) that used the Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS) to measure *DSM-IV* diagnostic criteria for PG.[5]

Items: The authors tested two-, three- and four-item models, and found that a three-item screen yielded satisfactory classification accuracy. The BBGS's three items include:

1. During the past 12 months, have you become restless, irritable, or anxious when trying to stop and (or) cut down on gambling?
2. During the past 12 months, have you tried to keep your family or friends from knowing how much you gambled?
3. During the past 12 months, did you have such financial trouble as a result of gambling that you had to get help with living expenses from family, friends, or welfare?

The BBGS time frame is the past 12 months and can be administered in one minute. Answering "yes" to one or more items is indicative of PG pending clinical evaluation.

Strengths and Limitations: Strengths of the BBGS include brevity of three items that can be administered in one minute; the use of a current time frame of past 12 months; simple "yes/no" response option and a simple scoring algorithm and interpretation; and the fact that it is based on a measure of the *DSM-IV* diagnostic criteria for PG which has shown

"The purpose of a brief screen is to indentify individuals who may have a gambling disorder…it helps to narrow down the number of people who will be referred for more time-intensive and costly comprehensive assessment."

evidence of classification accuracy. A limitation of the BBGS includes a lack of independence between the BBGS and the AUDADIS reference standard or criterion upon which the items were selected and against which the BBGS classification accuracy was tested.

INSTRUMENTS

Beyond brief screens, clinicians can also opt to administer assessment instruments that use longer and more comprehensive lists of signs and symptoms of PG. This review will focus on those instruments that are more commonly used and have received some evaluation by investigators. See Table 1 for a description of each instrument. This review will not include all of the technical information about reliability, validity and classification accuracy. This information can be found in articles by Stinchfield, Govoni and Frisch.[13]

Gamblers Anonymous 20 Questions (GA-20)

GA, like Alcoholics Anonymous, has a long history of support for people with gambling problems. GA uses a set of 20 items, commonly referred to as the GA-20,[6] for the purpose of indicating whether someone has a gambling problem. Each item has a "true/false" response option, and it takes about 10 minutes to complete. Endorsing seven or more questions indicates that the person is likely a pathological gambler. The questions include content such as remorse over gambling, gambling to forget problems, borrowing money to gamble and difficulty sleeping. Although not explicit about the intended time frame, the phrasing of the questions suggests a lifetime time frame rather than past year. Although the GA-20 has been around a long time, it has not been studied in depth and, therefore, little is known about its origin or about its reliability, validity and classification accuracy. A study by Ursua and Uribelarrea[14] notes that there are no published reports describing the development of the GA-20.

Strengths and Limitations: A strength of the GA-20 is that it was developed by disordered gamblers for disordered gamblers and therefore has good face and external validity. Another strength is that it is brief and simple to administer. In spite of being largely ignored by investigators, the few studies that have been conducted show evidence for satisfactory reliability, validity and classification accuracy.

South Oaks Gambling Screen (SOGS)

The SOGS[7] is a 20-item paper-and-pencil questionnaire used to screen for PG in clinical settings.[7] At the time of its development, both the *DSM-III*[1] *and DSM-III-R*[15] diagnostic criteria were available to assist in the development and validation of this screen.[16] The SOGS is scored by summing the number of items endorsed out of 20, and a cut score of 5 or more indicates "probable pathological gambling (PPG)." The SOGS is not a diagnostic instrument and, therefore, does not include all of the criteria required for a diagnosis of PG. The content of the SOGS inquires about hiding evidence of gambling, spending more

time or money gambling than intended, arguing with family members about gambling and borrowing money from a variety of sources to gamble or to pay gambling debts, to name a few of the items.

Strengths and Limitations: The SOGS exhibits a number of strengths, including that it is easy to administer and it has accumulated a large body of psychometric evidence across different populations. The SOGS also exhibits some limitations including heavy weighting of the scale on "sources of borrowed money." A respondent could be classified as PPG simply by endorsing five different sources of borrowed money. The lifetime time frame of the SOGS has been identified as a limitation previously because it combines current PPG and prior problem gamblers who are in recovery; however, this is remedied by reducing the time frame to past year or past six months.

Massachusetts Gambling Screen (MAGS)

The Massachusetts Gambling Screen (MAGS)[8] measures gambling problems in the past year and was designed to obtain an estimate of the prevalence of problem gambling in the general population. The MAGS was developed with a sample of adolescents; however, it is not an adolescent instrument. Rather it was developed for both adolescents and adults. The MAGS represents an effort to adapt an alcoholism screen, the Short Michigan Alcoholism Screening Test (SMAST)[17], for problem gambling.

Items: A 12-item measure of *DSM-IV* diagnostic criteria for PG was also developed as a criterion in the MAGS development study. The MAGS classifies respondents into one of three categories: (a) non-pathological gamblers, (b) in-transition or (c) pathological gamblers. The MAGS is scored by multiplying each item by a discriminant function coefficient and then summing all seven items and adding of a constant. Scores between 0 and 2 indicate "transitional" or "potential pathological gambler" and scores greater than 2 indicate PG.

Strengths and Limitations: The MAGS has a number of strengths, such as that it is brief, has face validity and has good psychometric properties. The MAGS also has some limitations, including a subclinical category of "in-transition," which assumes the person is transitioning either toward or away from PG, and this may or may not be true of all persons obtaining this score range. It has been reported that some individuals maintain a low problem severity level without moving in one direction or the other.[18] While item weighting provides greater precision for the sample from which the item weights were derived, these item weights may not be accurate when applied to another sample. That is, these item weights may be unique to this sample and may not generalize to other samples.

Diagnostic Interview for Gambling Schedule (DIGS)

The Diagnostic Interview for Gambling Schedule (DIGS)[9] is a structured diagnostic interview for use in settings, and it takes approximately 30 minutes to administer the 20-item interview.[9] The DIGS was developed to assist clinicians in diagnosing PG, determining need for further assessment and treatment planning. The DIGS includes content on demographics, gambling frequency, treatment history, age of onset of gambling, amounts of money bet and lost, sources of borrowed money, financial

problems, legal problems, mental health screen, other impulse disorders, medical status, family and social functioning and *DSM-IV* diagnostic criteria for PG (lifetime and past year). The interview is structured by using two items per criterion, and the items were paraphrased from the *DSM-IV* diagnostic criteria. If a respondent endorses either of the two items per criterion, the criterion is considered endorsed. One point is scored for each of the 10 criteria and summed scores range from 0 to 10. A score of 5 or more indicates PG.

Strengths and Limitations: Strengths of the DIGS include the interview method of administration that allows for probes by the interviewer and use of *DSM-IV* diagnostic criteria for diagnosis of PG.

Gambling Treatment Outcome Monitoring System (GAMTOMS)

As a result of the need to measure gambling treatment outcome, the Gambling Treatment Outcome Monitoring System (GAMTOMS) was developed in 1992 by Stinchfield and colleagues.[10,19] The GAMTOMS is available in paper-and-pencil questionnaires completed by the client and interviews completed by the clinician. The survey includes multiple instruments with multi-dimensional assessment made up of the following instruments: Gambling Treatment Admission Questionnaire/Interview; Gambling Treatment Discharge Questionnaire; Gambling Treatment Follow-up Questionnaire/Interview; and Gambling Treatment Services Questionnaire. These instruments use both past year and lifetime time frames. The GAMTOMS includes a 10-item measure of *DSM-IV* diagnostic criteria for PG, as well as other measures of gambling disorder severity, such as the SOGS, gambling frequency, gambling-related financial problems and legal problems. The *DSM-IV* diagnostic criteria items are one point each and are summed. The *DSM-IV* score range is 0 to 10 and scores of 5 or more indicate PG.

Strengths and Limitations: Strengths include multidimensional assessment of a number of content domains, two administration methods, a growing body of psychometric evidence, and repeated measures allows for assessment of change over time. A limitation is that the structured nature of the interview may prevent probing and building rapport with client.

National Opinion Research Center *DSM-IV* Screen for Gambling Problems (NODS)

The National Opinion Research Center at the University of Chicago developed a 17-item diagnostic measure based on *DSM-IV* diagnostic criteria for a U.S. national survey and is referred to as the NORC *DSM-IV* Screen for Gambling Problems (NODS).[11] The NODS measures some *DSM-IV* diagnostic criteria with two items and some are measured with one item. The NODS includes both a lifetime and past year time frame and the past year items are asked only if the lifetime item is answered with a "yes." The NODS score ranges from 0 to 10. A filter or screening question is asked before the NODS is administered. The screening question asks if the respondent's gambling resulted in losses greater than $100 in one day or over the past year. Interpretation of NODS scores is as follows: a score of 0 is considered a "low-risk gambler"; scores of 1 or 2 indicate an "at-risk gambler"; scores of 3 or 4 indicate a "problem gambler"; and scores of 5 or more indicate a "pathological gambler."

Strengths and Limitations: Strengths of the NODS include that it is relatively brief and easy to administer as well as being based on *DSM-IV* diagnostic criteria. The NODS also has some limitations, namely that it diverges from *DSM-IV* at important points. First, the filtering question of losing $100 or more was used because pretesting suggested that respondents who were "non-gamblers and very infrequent gamblers grew impatient with repeated questions about gambling related problems."[11(p. 19)] However, the loss of a certain dollar amount is not part of the *DSM-IV* criteria. Second, the NODS developers insert time periods and frequency parameters in questions, such as "past two weeks" and "three or more times," which are not present in the *DSM-IV*. While these additions of time periods and frequency parameters make rational sense, they need to be justified with empirical evidence. Third, the NODS lifetime time frame includes both current pathological gamblers and respondents who were pathological gamblers in the past but are not now; however, the NODS also includes a past year time frame which provides a more accurate estimate of current PG. More importantly, the lifetime time frame appears to allow an individual to be classified as a pathological gambler when their symptoms may not have occurred contiguously within a given time period.

The NODS score interpretations also depart from the *DSM-IV* of either absence or presence of PG. What is the empirical evidence for these categories and cut scores? What are the definitions of these subclinical categories? All 10 *DSM-IV* diagnostic criteria represent symptoms of a severe gambling disorder. Is there any evidence that endorsing one or two high problem severity symptoms makes someone an "at-risk gambler" or having three or four high problem severity symptoms makes someone a "problem gambler"? These subclinical categories need to be defined and will require psychometric research to show that they are valid categories that can be accurately classified.

Canadian Problem Gambling Index (CPGI)

Ferris and Wynne developed the CPGI because of the need for a new, more meaningful measure of gambling disorders for use in general population surveys with more indicators of the social and environmental context of gambling and "problem gambling."[12] "Problem gambling" was defined as gambling behavior that creates negative consequences for the gambler, others in his or her social network or for the community. The CPGI includes 31 items, nine of which are scored as a measure of problem gambling that is referred to as the Problem Gambling Severity Index (PGSI). The nine-item PGSI uses four response options: never (score of 0); sometimes (score of 1); most of the time (score of 2); and almost always (score of 3). The time frame is past year. The PGSI score is the sum of all nine items and the score ranges from 0 to 27. The PGSI scores are interpreted as follows: no gambling behaviors and score of 0 indicates "non-gambling;" gambling behaviors and score of 0 indicates "non-problem gambling;" a score of 1 to 2 indicates "low risk gambling;" a score of 3 to 7 indicates "moderate risk gambling;" and a score of 8 or more indicates "problem gambling." The cut scores and categories were determined "with respect to the distribution of scores on the problem gambling continuum … and more research is necessary in order to provide a strongly supported division between low and moderate risk groups."[12(p. 42)] The other CPGI items measure gambling involvement (types of gambling activity, frequency, spending), correlates of problem gambling that can be

used to develop profiles of different types of gamblers or problem gamblers, the social and environmental context of the gambler (e.g. family background of gambling, alcohol or drug problems, exposure to stimulus from which individual wishes to escape) and predispositions of the gambler (co-morbidity, distorted cognitions). The CPGI can be administered as an interview in approximately 15 minutes.

Strengths of the CPGI include systematic and empirical development; a brief nine-item measure of problem gambling severity; inclusion of multiple dimensions; multiple response options; unique item about effect of gambling on physical health; a growing body of evidence of satisfactory psychometric properties, particularly classification accuracy. A limitation of the PGSI is that it is not so much a new scale but rather a new selection of existing items drawn from the SOGS and *DSM-IV*. The use of "low risk gambling" and "moderate risk gambling" categories has not been clearly defined or justified with empirical evidence.

Readers interested in more information about any of the instruments reviewed here should consult the scientific articles listed in the references section.

TABLE 1. Descriptions of Brief Screens and Instruments

BRIEF SCREENS

Name of Instrument (year)	Content Areas	Items: number, response options and time frame	Administration Time and Method	Scoring: instructions, score range, cut-scores and interpretation of scores
Lie/Bet (1997)[2]	Items determine if individual lies to others about gambling behaviors or bets more and more money	Two items; "yes/no" response options; lifetime time frame	One-minute interview	Answering "yes" to one or both items indicates PG
NODS-CLiP (2009)[3]	Items drawn from NODS: loss of control, lying and preoccupation	Three items; "yes/no" response options; lifetime time frame	One-minute interview	Answering "yes" to one or more items is indicative of PG.
NODS-PERC (2011)[4]	Content drawn from NODS: preoccupation, escape, risked relationships and chasing	Four items; "yes/no" response options; lifetime time frame	One-minute interview; intended for use in clinical settings	Answering "yes" to one or more items is indicative of need for further PG assessment
Brief Biosocial Gambling Screen (BBGS) (2010)[5]	Drawn from *DSM-IV:* withdrawal, lying and financial trouble	Three items; "yes/no" response options; past 12 months time frame	One-minute interview	Answering "yes" to one or more items is indicative of PG pending clinical evaluation

(Table continued on next page)

TABLE 1. Descriptions of Brief Screens and Instruments

LONG INSTRUMENTS/SCALES

Name of Instrument (year)	Content Areas	Items: number, response options and time frame	Administration time and method	Scoring: instructions, score range, cut-scores and interpretation of scores
Gamblers Anonymous 20 questions (GA-20)[6]	Determines signs and symptoms of PG and other negative consequences	20 items; "true/false" response option; lifetime time frame	10-minute paper and pencil questionnaire or interview	One point for each item; score of 7 or more indicates PG
South Oaks Gambling Screen (SOGS) (1987)[7]	Used to determine the games played; signs and symptoms of problem gambling; negative consequences and sources of money to gamble.	20 scored items; response options vary; lifetime time frame	10- to 20-minute paper and pencil questionnaire	One point for each item; score range 0-20; score of 5 or more indicates probable pathological gambling (PPG)
Massachusetts Gambling Screen (MAGS) (1994)[8]	Test looks for signs and symptoms of PG and psychological and social problems associated with gambling disorders. This study also included a 12-item measure of *DSM-IV* diagnostic criteria	14-item questionnaire; seven items are scored; past year time frame	Five- to 10-minute paper-pencil questionnaire	MAGS items are scored by multiplying each item times a discriminant function coefficient, and then added together with a constant. A score between 0 to 2 labels a "transitional gambler" or PPG. A score greater than 2 indicates PG.
Diagnostic Interview for Gambling Schedule (DIGS)[9]	Measures demographics, gambling involvement, treatment history, onset of gambling, gambling frequency, amounts of money bet and lost, sources of borrowed money, financial problems, legal problems, mental health screen, other impulse disorders, medical status, family and social functioning and diagnostic symptoms (lifetime and past year)	20 diagnostic symptom items to measure the two *DSM-IV* diagnostic criteria (two items for each criterion); measures lifetime and past year time frames	30-minute interview	If respondent endorses either of the two items per criterion, the criterion is considered endorsed. One point is scored for each of the 10 criteria. The score range is from 0 to 10; a cut score of 5 or more indicates PG.
Gambling Treatment Outcome Monitoring System (GAMTOMS) (1996)[10]	The Gambling Treatment Admission Questionnaire includes a 10-item measure of *DSM-IV* diagnostic criteria for PG, as well as other measures of gambling problem severity, including the SOGS, gambling frequency, gambling-related financial problems and legal problems.	142-item Gambling Treatment Admission Questionnaire has a 10-item measure of *DSM-IV* diagnostic criteria	30- to 45-minute paper and pencil questionnaire	The *DSM-IV* diagnostic criteria items are one point each and are summed. The score range is 0 to 10; a cut score of 5 or more indicates PG.

(Table continued on next page)

TABLE 1. Descriptions of Brief Screens and Instruments

LONG INSTRUMENTS/SCALES

Name of Instrument (year)	Content Areas	Items: number, response options and time frame	Administration time and method	Scoring: instructions, score range, cut-scores and interpretation of scores
National Opinion Research Center *DSM-IV* Screen for Gambling Problems (NODS) (1999)[11]	*DSM-IV* diagnostic criteria for diagnosing PG including lifetime and past year time frames.	17-item questionnaire; both "yes/no" and multiple choice response options; both lifetime and past year time frames	Five- to 10-minute interview	NODS is scored one point for each *DSM-IV* criterion. The score range is from 0 to 10. A score of 0 indicates low-risk gambling; a score of 1 or 2 indicates at-risk gambling; scores of 3 or 4 indicate problem gambling; and scores of 5 or more indicate PG.
Canadian Problem Gambling Index (CPGI) (2001)[12]	Measures gambling involvement, problem gambling, adverse consequences, family history of gambling, comorbid disorders and distorted cognitions.	31 total items with a nine-item problem gambling scale including four response options (never, sometimes, most of the time and almost always)	15-minute interview	The PGSI score range is from 0 to 27. A score of 0 indicates non-PG; scores of 1 or 2 indicate low risk gambling; scores from 3 to 7 indicate moderate risk gambling and scores of 8 or more indicate problem gambling.

About the author…

Randy Stinchfield, Ph.D., L.P., is a licensed clinical psychologist and associate director of the Center for Adolescent Substance Abuse Research in the department of psychiatry at the University of Minnesota Medical School. In 1989, Dr. Stinchfield began a program of research on gambling, including youth gambling, gambling assessment and the evaluation of gambling treatment.

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RESEARCH SUMMARY

Psychosocial Interventions for Gambling Disorders

by Jon E. Grant, M.D., J.D., M.P.H.
University of Chicago
and
Brian L. Odlaug, M.P.H.
University of Chicago and University of Copenhagen, Denmark

Current treatment for pathological gambling (PG) involves a number of different options, including inpatient treatments, intensive outpatient, individual and group cognitive behavioral therapy options and pharmacotherapy. All have all demonstrated benefits in treating gambling disorders.[1, 2] This chapter will review the various psychosocial interventions currently being used and tested in research on gambling disorders. (For information on pharmacological interventions, see page 52).

HIGHLIGHTS

- Current treatment for pathological gambling (PG) involves a number of different options, including inpatient treatments, intensive outpatient, individual and group cognitive behavioral therapy (CBT) options and pharmacotherapy.
- Despite the significant personal costs associated with PG, prevalence surveys indicate that only a small proportion of the individuals who are suffering from a gambling disorder will seek formal treatment.
- Although there is currently no agreed upon standard-of-care for gambling disorders, the most widely studied treatment for PG has been some form of cognitive-behavioral therapy (CBT).
- CBT has demonstrated benefits in various studies, but more research is needed to truly determine its effectiveness.

RESISTANCE TO TREATMENT AND NATURAL RECOVERY

Despite the significant personal costs associated with PG, prevalence surveys indicate that only a small proportion of the individuals who are suffering from a gambling disorder will seek formal treatment.[3-6] In fact, Suurvali and colleagues found that less than 6 percent of problem gamblers actually seek formal treatment.[4] A desire to handle the problem on their own, lack of knowledge about where to receive treatment and shame have been identified as contributing factors to the low level of treatment-seeking behavior. A comparison of past-year prevalence rates of gambling disorders with lifetime rates suggests a one-third recovery rate.[7, 8] Research suggests that the majority of these individuals have accomplished their recoveries without accessing formal treatment services,[2, 7] which is consistent with research on other addictive disorders.[9] In-depth interviews with naturally recovered gamblers reveal that their recovery strategies are behavior-focused and similar to those who have accessed treatment (e.g., involvement in time-consuming activities that are incompatible with gambling and avoiding conditioned cues to gamble such as gambling venues).[2]

Although the phenomenon of natural recovery from problem gambling occurs in an estimated 35 percent of individuals,[8,10] most disordered gamblers report a chronic course, with symptom severity fluctuating over time.[11] Underscoring the importance of identifying and treating PG, a study of those seeking treatment for gambling disorders found that 48 percent had frequent suicidal ideation while 12 percent reported a gambling-related suicide attempt.[12] Some form of treatment, therefore, is needed for the majority of individuals with a gambling problem.

OVERVIEW OF TREATMENT FOR GAMBLING DISORDERS

Although there is currently no agreed-upon standard-of-care for gambling disorders, the most widely studied treatment for PG has been some form of cognitive-behavioral therapy (CBT). A research review identified 22 randomized trials, published between 1968 and 2004.[13] This analysis revealed that, in general, psychological treatments were more effective than no treatment at both post-treatment and at follow-up averaging 17 months later.[2] A more recent review that included 25 studies[14] found that although there was considerable variability in the outcomes reported, post-treatment effects were generally positive for different types of therapy (e.g., behavioral, cognitive) and mode of therapy (e.g., individual, group, self-directed). To date, there are no randomized trials of inpatient treatment.[15]

TREATMENT OPTIONS FOR GAMBLING DISORDERS

- Psychotherapy
- Cognitive Therapy
- Cognitive-Behavioral Therapy
- Cue-exposure
- Brief Interventions and Motivational Interviewing
- Family Therapy
- Gamblers Anonymous
- Self-exclusion

Psychotherapy

A variety of psychosocial treatments have been examined in the treatment of PG. Cognitive strategies have traditionally included cognitive restructuring, psychoeducation, understanding of gambling urges and irrational cognition awareness training. Behavioral approaches focus on developing alternate activities to compete with reinforcers specific to PG, as well as the identification of gambling triggers.

Cognitive Therapy

Cognitive treatment focuses specifically on modifying the maladaptive and distorted cognitions associated with gambling, including overestimating probabilities of winning, illusions of control over the outcome of a gamble, the belief that a win is due following a series of losses (i.e., the gambler's fallacy) and memory biases in favor of remembering wins and discounting losses.[16] Superstitious beliefs surrounding gambling behavior, including talismanic superstitions in which the person believes that carrying certain items (such as a rabbit foot keychain or lucky coin) or cognitive superstitions (doing things in a certain way will increase the odds of winning), are common and are the focus of cognitive therapy.

Three controlled studies have examined the effect of cognitive restructuring in PG. One study used a combination of individual cognitive therapy and relapse prevention strategies.[17] At 12 months, the treatment group showed significant reductions in gambling frequency and an increase in self-perceived control over their gambling behavior. The same cognitive therapy techniques combined with relapse prevention were compared with a three-month wait-list control[i] in a group of 88 pathological gamblers. The treatment group experienced gambling symptom improvement at three months and maintained it at the 12-month follow up.[18]

[i]A wait list control group is a group that is assigned to a waiting list to receive an intervention after the clinical trial is complete. A wait list control group serves the purpose of providing an untreated comparison for the active treatment group, while at the same time allowing the wait-listed participants an opportunity to obtain the intervention at a later date.

Group cognitive therapy has also been tested in 71 participants with PG against a wait list control condition.[19] Groups met for two hours weekly for 10 weeks. After 10 sessions, 88 percent of those in the cognitive-behavioral therapy (CBT) group (described in the next section) no longer met PG criteria, compared with 20 percent in the wait-list condition. At the 24-month follow-up, 68 percent of the original group's CBT participants still did not meet the criteria.

Although both individual and group cognitive therapies have shown promise in treating PG, rates of treatment dropout were high in these studies (up to 47 percent). In addition, the cognitive therapy studies have not yet determined the optimal number of sessions needed to reduce gambling symptoms and maintain improvement.

Cognitive-Behavioral Therapy (CBT)

Although a small number of trials have evaluated the efficacy of a purely cognitive approach, the largest number and the most rigorously designed trials have evaluated a combined CBT model. The rubric of CBT, however, encompasses a wide range of therapeutic approaches. Overall, while there is variability in the content and outcomes of CBT, positive effects have generally been found by different research groups.[14]

Behavioral models conceptualize gambling disorders as learned patterns of reinforcement within a functional framework. Continued gambling behaviors stem from a variable pattern of reinforcement with respect to antecedents (e.g., external gambling cues, positive or negative emotions), behaviors (e.g., chasing of losses, strategizing to attain money), and consequences (e.g., financial loss).[2] CBT treatments focus on modifying one or more components of this functional relationship in order to modify the learned patterns. Behavioral strategies include reducing exposure to high-risk situations, challenging distorted thoughts and developing skills in various areas (e.g., assertiveness, problem solving, and relaxation).

A randomized study of CBT in slot-machine–players diagnosed with a gambling disorder assigned participants to one of four groups: (1) individual stimulus control and in vivo exposure with behavioral response strategies (otherwise known as relapse prevention) (in vivo exposure is exposure to the actual object or situation that triggers the cravings or negative emotions while imaginal exposure is exposure to an image of the trigger object), (2) group cognitive restructuring, (3) a combination of (1) and (2), or (4) a wait-list control.[20] At the 12-month follow-up session, rates of abstinence or minimal gambling were higher in the individual treatment participants (69 percent) compared with the cognitive restructuring (38 percent) and combined treatment (38 percent) groups. The same investigators also assessed individual and group relapse prevention for participants completing a six-week individual treatment program. At 12 months, 86 percent of those receiving individual relapse prevention and 78 percent of those in the relapse prevention group had not relapsed, compared with 52 percent of those who received no follow-up treatment.[21]

Milton and colleagues (2002) compared CBT with a combination of CBT and other interventions designed to improve treatment compliance (the interventions included positive reinforcement, identifying barriers to change, and applying problem-solving skills) in 40 participants receiving eight sessions of manualized individual therapy. Only 35 percent

of the CBT-alone group completed treatment compared with 65 percent of the CBT-plus-interventions group. At the nine-month follow-up marker, there was no difference in outcomes between treatments, although both produced clinically significant change.[22]

Melville and colleagues[23] reported two studies that used a system targeting three topics (understanding randomness, problem solving and relapse prevention) to improve outcome. In the first study, 13 participants were assigned to either eight weeks of group CBT, group CBT with the topic-enhanced treatment, or a wait list. In the second study, 19 participants were assigned to a topic-enhanced group or a wait-list group for eight-weeks. For those participants who were in the topic-targeting CBT group, significant improvement was maintained both post-treatment and at a six-month follow-up.[23]

Another study examined an eight-session manualized form of CBT, randomizing 231 participants to weekly sessions with an individual counselor, therapy in the form of a workbook, or referral to Gamblers Anonymous (GA)[24] Although all groups reduced their gambling, participants assigned to individual therapy or to the self-help workbook reduced gambling behaviors more than those referred to GA.[24]

In a study examining cognitive-motivational behavior therapy (CMBT), a method that combines gambling-specific CBT with motivational interviewing techniques to aid in resolving treatment ambivalence and improve retention rates, nine participants received manualized treatment and were compared with a control group of 12 who received treatment as usual (TAU). All nine participants (100 percent) in the CMBT group completed treatment versus only eight (66.7 percent) in the TAU group. Significant improvements were observed at the 12-month follow-up of the CMBT group.[25]

Cue-exposure

Cue-exposure, based on classical conditioning, is a well-validated form of CBT used in the treatment of fear-based problems.[26] Its goal is to extinguish the feared or learned response (e.g., fear, panic) through repeated exposure to a conditioned stimulus (e.g., dogs) in the absence of the feared consequence (e.g., not all dogs bite, I am safe). There is preliminary evidence on the use of cue-exposure therapy with addictions that urges or cravings can be elicited using in vivo and imaginal exposure techniques.[27] Cue reactivity to relevant stimuli (drug/alcohol) appears to be an important factor in addiction that can contribute to relapse.[28] Cue-exposure studies conducted with PG [20,29-31] have reported positive findings to date, yet with only a few randomized controlled trials.

The first randomized study compared imaginal desensitization (i.e., participants were taught relaxation and then instructed to imagine experiencing and resisting triggers to gambling) with traditional aversion therapy.[32] Both therapies had positive effects, but the imaginal desensitization group was more successful in reducing gambling urges and behavior.

In a second study, 20 inpatient participants were randomized to receive either imaginal desensitization or imaginal relaxation in 14 sessions over a one-week period. Both groups improved post-treatment, but the therapeutic gains were not maintained by either group at a 12-month follow-up.[33]

In a larger study, 120 participants were randomly assigned to aversion therapy, imaginal desensitization, in vivo desensitization (process of desensitization in real life situations) or

For a full list of research on psychosocial interventions, see Table 1 on page 46.

imaginal relaxation. Participants assigned to imaginal desensitization reported better outcomes at one-month and up to nine years later.[30]

Using imaginal desensitization and combining cue-exposure with negative mood induction, Grant and colleagues[34] examined 68 pathological gamblers assigned to six sessions of treatment or GA. The negative mood induction involves focusing on the negative consequences of the problem behavior while the urge to engage in gambling is active. The therapy elicits an urge to engage in gambling using gambling-specific cues (e.g., sounds of the casino) as well as the relevant emotions experienced before, during, and after a gambling episode (e.g., euphoria before and during gambling and dysphoria and agitation after gambling). In the study, participants listened to a pre-recorded imaginal exposure unique to each participant's negative consequences of gambling. Grant and colleagues found that 64 percent of participants receiving imaginal exposure plus the negative mood induction as part of a six-session CBT program were able to maintain abstinence for one month, as opposed to only 17 percent of those randomly assigned to GA. For the CBT with imaginal exposure plus negative mood induction group, among those participants who responded to therapy after six sessions, 77 percent maintained their response for six months.[35]

Brief Interventions and Motivational Interviewing

Brief treatments are not necessarily perceived as treatment by the individuals who access them[2] and, therefore, may be more appealing to gamblers who report significant ambivalence about stopping their behavior. Brief treatments are designed to use fewer professional resources or less time than face-to-face interventions and may include single-session interventions, workbooks or bibliotherapy. Motivational interviewing (MI), an approach that is often used in brief interventions, is empathic and uses the strengths of the client to enhance self efficacy regarding changes in behavior.

An early study of brief interventions randomly assigned 29 participants to either a workbook or to a workbook plus a single in-depth interview.[36] The workbook included CBT and motivational-enhancement techniques. Both groups reported significant reductions in gambling at a six-month follow-up.

Hodgins and colleagues[37] assigned 102 gamblers to a CBT workbook, a workbook plus a telephone motivational-enhancement intervention, or a wait list. Rates of abstinence at the six-month follow-up did not differ between the groups, although the frequency of gambling and amount of money lost gambling were lower in the motivational intervention group. Compared with the workbook alone, the motivational intervention and workbook together reduced gambling throughout a two-year follow-up period; notably, 77 percent of the entire follow-up sample was rated as improved at the two-year assessment.[38]

Another study[39] compared a single-session motivational-interviewing module plus a self-help workbook with the workbook and speaking with an interviewer about gambling for 30 minutes. Half of the sample was randomized to each intervention. At 12-month follow-up, those who received the motivational interviewing plus workbook gambled less and spent less money than the workbook-alone group.[39]

A study using a relapse-prevention bibliotherapy randomized 169 participants who had recently quit gambling to receive either a summary booklet that detailed all available relapse prevention information (single mailing group) or the same booklet plus seven additional informational booklets mailed over the next 12-months (repeated mailing group).[40] At the 12-month assessment, 24 percent of the repeated mailing group reported using the strategies regularly to prevent relapse compared with 13 percent of the single mailing group. Only 44 percent of the overall sample, however, reported having not gambled over the three months prior to the 12-month assessment.

Two self-directed motivational interventions were compared with a six-week waiting list control and a workbook only control in 314 pathological gamblers. Brief motivational treatment involved a telephone motivational interview and a mailed self-help workbook. Brief motivational booster treatment involved a telephone motivational interview, a workbook and six booster telephone calls over a nine-month period. Both the brief and the brief booster treatment participants reported less gambling at six weeks than those assigned to the control groups. Brief and brief booster treatment participants gambled significantly less often over the first six months of the follow-up than workbook only participants. Participants in the brief booster treatment group, however, showed no greater improvement than brief treatment participants.[41]

A similar combination of motivational interviewing and CBT was adapted to a web-based format in Sweden[42] in which a therapist provides telephone support for individuals using online recovery materials. A wait-list control was compared with the eight-week Internet-based CBT program with minimal therapist contact via e-mail and weekly telephone calls of less than 15 minutes. Average time spent on each participant, including phone conversations, email, and administration, was four hours. The Internet-based intervention resulted in favorable changes in PG, anxiety, depression and quality of life. Follow-up sessions in the treatment group at six-, 18- and 36-months indicated that treatment effects were sustained.

A total of 150 primarily self-recruited patients with current gambling problems or PG were randomized to four individual sessions of motivational interviewing, eight sessions of CBT group therapy or a no-treatment wait-list control. Treatment showed superiority in some areas over the no-treatment control in the short term, but no differences were found between motivational interviewing and group CBT at any point in time. Instead, both interventions produced significant within-group decreases on most outcome measures up to the 12-month follow-up.[42]

A randomized controlled study found that a 10-minute session of behavioral advice, one session of motivational enhancement therapy or one session of motivational enhancement therapy plus three sessions of CBT were all equally effective in reducing gambling among a sample of 117 college students with either problem or PG.[43]

Two small trials have shown that the addition of motivational interviewing to CBT reduces treatment attrition and improves outcomes.[25,39] Dropout rates from psychosocial treatment are high so, interventions that lead patients to complete treatment are potentially very valuable.

Family Therapy

Advances in family therapy interventions for treating substance abuse problems have been adapted for gambling disorders. A self-help workbook of the Community Reinforcement and Family Therapy (CRAFT) model, adapted for gambling, has been evaluated in two randomized controlled trials.[40,44] In CRAFT, family members are trained to use behavioral principles to reinforce non-gambling behavior in individuals who are not addressing their gambling problem. Although positive effects for family members and their gambling relatives were found in both trials, the studies found that behavioral principles were too complex for family members to implement without the support of a therapist.[40]

A coping skill-training program developed for alcohol problems has also been evaluated for gambling. The program consists of 10 weekly individual sessions to teach more effective coping skills. A small randomized controlled trial comparing the coping skills program to a delayed treatment condition showed that partners of gamblers improved their ability to manage feelings of depression and anxiety. Partner gambling during that period decreased in both conditions but did not differ between them, nor did partner help-seeking differ.[45]

Gamblers Anonymous (GA)

GA self-help groups use a program of 12 steps and traditions, modified from Alcoholics Anonymous, to acknowledge powerlessness over gambling and to remain gambling-free.[2] There are few outcome studies evaluating the effectiveness of GA, and well-controlled efficacy research has not been conducted.

One study compared the effectiveness of CBT with eight sessions of a twelve-step treatment-oriented approach based on the first five steps of GA. No group differences on key gambling variables (e.g., frequency, abstinence rates, money wagered) were reported at 12 months. Participants who attended more GA sessions and chose an initial abstinence treatment goal appeared to achieve better outcomes.[46]

Correlational data have shown that individuals affiliated with GA have better gambling outcomes than those who do not,[47] even when they are concurrently engaged in professional treatment.[24]

Treatment outcome studies that have used referral to GA as a comparison condition to CBT treatment, however, have shown poor GA attendance and outcomes.[24,34] Further, a study examining outcomes of 232 GA attendees at a one- and two-year follow-up found very high rates of dropout and abstinence rates of only 8 percent at one-year follow-up and 7 percent at the two-year follow-up.[48]

Self-Exclusion: Adjunct to Treatment

One intervention that can be an adjunct to formal treatment is self-exclusion[49] in which gamblers effectively ban themselves from a gaming venue such as a casino. Early research has indicated that self-exclusion has been effective in a minority of participants. Approximately 24 to 30 percent of self-excluded participants complied with their initial agreement and remained abstinent from all forms of gambling over a period of one to five

years.[50-52] Those who participated in complementary treatment or self-help groups had more positive outcomes.[52] No controlled studies (i.e., research in which the group receiving the intervention is compared to a group not receiving the intervention), however, have been conducted using this type of intervention as a formal treatment for gambling disorders.

CONCLUSIONS

Even though there are many treatment options, these studies demonstrate that CBT is beneficial for gambling disorders. However, many questions remain.

- Which form of CBT is best and for whom? There have been no comparison studies of the different manualized forms of CBT, and so one cannot make recommendations at this time regarding which approach is most effective. Also, no manualized CBT treatment has been examined in a confirmatory study by another independent investigator. The heterogeneity of gambling treatment samples may also complicate identification of effective treatments.
- What is the optimal duration of therapy? Given the success and low cost of brief interventions, should everyone try a brief intervention first and only if they fail that move on to more intensive therapy?
- What specific components should be included in the CBT program? Which components are most effective? Do certain people respond differently to different CBT components? No study has examined whether certain individuals with gambling disorders would benefit differentially from specific CBT treatments. The matching of different treatment approaches to different subtypes of gambling disorders, based on neurobiology or genetics, may improve treatment outcomes.
- What role does comorbidity play? Although naturalistic follow-up research on gamblers demonstrate that drug use disorders are associated with less likelihood of gambling abstinence,[53] some research shows that gamblers with or without mental health problems respond equally well to CBT.[54] Other research suggests that comorbidity with nicotine dependence may result in greater rates of relapse following treatment[35] and that perhaps gamblers who have comorbid schizophrenia may require more sessions of therapy (i.e., 20 sessions).[55]
- Should the goal of treatment be abstinence? Offering flexibility (i.e., abstinence, decreased gambling, more control) to individuals may increase treatment-seeking and decrease treatment dropout. A recent study of 89 individuals undergoing 14 sessions of CBT offered treatment with controlled gambling as the goal.[56] The majority (66 percent) of participants changed their goal to abstinence during the 12 weeks of treatment. Outcomes, however, did not differ between those who maintained a goal of controlled gambling and those whose goal was abstinence. The goal of controlled gambling did not result in a lower rate of dropout compared with studies of abstinence-oriented treatment.

Although multiple forms of CBT have demonstrated benefits for gambling disorders, the limitations associated with these data preclude making specific treatment recommendations, on an individual level, with a substantial degree of confidence. Despite the progress in the development of effective treatments for gambling disorders, more research is needed to address the remaining questions.

TABLE 1. Controlled Psychological Treatment Trials for Pathological Gambling

Reference	Study Design and Duration	Participants	Outcome
COGNITIVE THERAPY			
Sylvain et al. (1997)	Cognitive therapy (CT) + relapse prevention vs. wait list 30 sessions with six-month follow-up	40 enrolled 14 vs. 22 in treatment groups completed	CT: 36 percent improved on five gambling severity variables vs. 6 percent on wait list control
Ladouceur et al. (2001)	Cognitive therapy + relapse prevention vs. wait list 20 sessions with 12-month follow-up	88 enrolled 35 vs. 59 in treatment groups completed	CT: 32 percent improved on four variables vs. 7 percent on wait list
Ladouceur et al. (2003)	Group cognitive therapy (GCT) + relapse prevention vs. wait list 10 weeks with two-year follow-up	71 enrolled 34 vs. 46 in treatment groups completed	GCT: 65 percent no longer met PG criteria vs. 20 percent on wait list
COGNITIVE-BEHAVIORAL THERAPY			
Echeburua et al. (1996)	Groups: Stimulus control with in vivo exposure and relapse prevention (SCERP), cognitive restructuring, combined treatment and wait list Six weeks with 12-month follow-up	64 enrolled 50 completed	At 12 months, abstinence or much reduced gambling present in 69 percent of SCERP group vs. 38 percent of cognitive restructuring or combined treatment groups
Milton et al. (2002)	Individual CBT vs. CBT + interventions to improve treatment compliance Eight sessions with a nine-month follow-up	47 enrolled 40 assigned to treatment (20 in CBT, 20 in CBT + compliance interventions) 20 completed (72.5 percent male)	65 percent of CBT + compliance interventions group completed vs. 35 percent of CBT-only group
Melville et al. (2004)	Group CBT, group + interactive written assignments (mapping) vs. wait-list control; Two 90-minute sessions each week for eight weeks	Exp. #1: 20 enrolled, 13 treated Exp. #2: 28 enrolled, 19 treated (84.2 percent female)	CBT with mapping group decreased PG symptoms compared with control group. Exp. #2 added depression and anxiety comorbidity, which decreased compliance; maintained at six-month follow-up
Petry et al. (2006)	Manualized CBT in individual counseling vs. CBT workbook vs. GA referral Eight sessions with one-year follow-up	231 enrolled 181 completed	CBT was more effective than Gamblers Anonymous and individual counseling more effective than workbook; at 12 months, groups did not differ in abstinence rates

(Table continued on next page)

TABLE 1. Controlled Psychological Treatment Trials for Pathological Gambling

Reference	Study Design and Duration	Participants	Outcome
COGNITIVE BEHAVIORAL THERAPY (continued)			
Wulfert et al. (2006)	Cognitive-Motivational Behavior Therapy (CMBT) vs. treatment as usual (TAU) 16 sessions with three-, six- and 12-month follow-up	Nine of nine completed CMBT group Eight of 12 completed TAU group (100 percent male)	Significant PG symptom improvement was maintained at 12-month follow-up for CMBT group
Echeburúa, Gómez, & Freixa, (2011)	Psychoeducation, stimulus control, gradual exposure and relapse prevention 20 sessions with three-, six- and 12-month follow-up	44 enrolled 41 completed	The CBT group had greater improvement in gambling episodes and money spent on gambling; less robust at six- and 12-month follow-up
CUE-EXPOSURE			
McConaghy et al. (1983)	Aversion therapy vs. imaginal desensitization	20 enrolled 20 completed	Improvement in both treatment groups over 12 months
McConaghy et al. (1988)	Imaginal desensitization (ID) vs. imaginal relaxation (IR); 14 sessions in a one-week period (inpatient sample)	20 enrolled 20 completed (95 percent male)	Both ID and IR groups improved at post-treatment, but improvement lessened by 12-month follow-up
McConaghy et al. (1991)	Aversion therapy vs. imaginal desensitization vs. in vivo desensitization vs. imaginal relaxation	120 enrolled 63 available two and nine years later	Imaginal desensitization improved at one month and nine years
Grant et al. (2009); Grant et al. (2011)	Manualized CBT with imaginal desensitization and motivational interviewing (IDMI) vs. Gamblers Anonymous referral; six sessions with six-month follow-up	68 enrolled 55 completed (63 percent female)	Greater gambling severity reduction overall and abstinence rates one-month post-treatment were higher in IDMI group; response maintained in 77 percent of participants at six-month follow-up
BRIEF INTERVENTIONS AND MOTIVATIONAL INTERVIEWING			
Dickerson et al. (1990)	CBT workbook vs. workbook + a single in-depth interview	29 enrolled	Both groups improved at six months
Hodgins et al. (2001)	CBT workbook vs. workbook + motivational enhancement intervention via telephone vs. wait list	102 enrolled 85 available at 12 months	74% with motivational enhancement improved (Clinical Global Impression) vs. 61% with workbook and 44% on wait list
Hodgins & Holub, (2007)	Single-session motivational interview (MI) with self-help workbook vs. workbook alone. Single session with 12-month follow-up	Unclear	The MI group gambled less often and spent less money at 12-month follow-up vs. the workbook-alone group

(Table continued on next page)

TABLE 1. Controlled Psychological Treatment Trials for Pathological Gambling BRIEF INTERVENTIONS AND MOTIVATIONAL INTERVIEWING (continued)			
Reference	**Study Design and Duration**	**Participants**	**Outcome**
Hodgins et al. (2007)	Relapse-prevention bibliotherapy – single mailing vs. repeated mailings over a 12-month period Mailings done once for first group (n=85) vs. seven mailings for second group (n=84), with 12-month follow-up	169 enrolled 142 available at 12-month follow-up (58 percent male)	The repeated-mailing group improved more than the single-mailing group but not significantly. However, 70 percent of the sample still met SOGS criteria for PG at 12-month follow-up
Hodgins et al. (2007)	Intervention groups (based on CRAFT): Self-help workbook vs. workbook + telephone support vs. control group Three- and six-month follow-up	186 enrolled	Intervention groups had less days gambled but behavioral principles too complicated for family members to implement
Carlbring & Smit, (2008)	Web-based CBT with telephone support and online workbook materials vs. waitlist control; Six-, 18- and 36-month follow-up	66 enrolled 60 with post-treatment data	Nearly 75 percent of treatment participants reported moderate to large improvements maintained at 36-month follow-up
Hodgins et al. (2009)	Motivational interview + mailed self-help workbook vs. six-week waitlist control or workbook-only control Six-, nine- and 12-month follow-up completed	314 enrolled 267 completed 12-month follow-up (55.4 percent female)	Brief MI resulted in decreased gambling at follow-up; Workbook-only group just as improved as MI group
Diskin & Hodgins, (2009)	Single in-person motivational interviewing vs. control interview One-, three-, six- and 12-month follow-up	81 enrolled 69 completed 12-month follow-up (43 percent female)	MI group reported significant reductions in gambling severity and maintained at 12-month post-intervention
Petry et al. (2009)	Four conditions: Brief advice vs. motivational enhancement therapy (MET) vs. MET + CBT vs. no-treatment control; Nine-month follow-up	117 enrolled 114 completed Week 6 evaluation 113 completed 9-month follow-up (15 percent female)	All treatment conditions provided significant symptom improvement although MET had the most significant effect relative to the control group
Carlbring et al. (2010)	Group CBT (eight sessions) vs. motivational interviewing (four sessions) vs. no-treatment control group Six- and 12-month follow-up	150 enrolled	Group CBT and motivational interviewing both improved PG, anxiety, and depression symptoms significantly

About the authors…

Jon E. Grant, M.D., J.D., M.P.H., is professor of psychiatry at the University of Chicago. He served as the principal investigator of one of the first NCRG Center of Excellence in Gambling Research, awarded by the NCRG in 2009.

Brian L. Odlaug, M.P.H., is a visiting researcher at the University of Copenhagen, Denmark and with the department of psychiatry and behavioral neuroscience at the University of Chicago. He continues to work with Dr. Grant on gambling research.

DISCLOSURE

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RESEARCH SUMMARY

Pharmacological Approaches to Treating Pathological Gambling

by Marc N. Potenza, M.D., Ph.D.
Yale University School of Medicine

HIGHLIGHTS

- The standard of care has advanced dramatically in recent years. Now, patients with mental health disorders typically receive a combination of pharmacological and behavioral therapies.
- Currently there are no FDA-approved medications for pathological gambling (PG). Although this situation places prescribers at a relative disadvantage when treating people with PG, clinicians should be aware of the advances that have been made in pharmacological treatments.
- Arguably the medications with the most empirical support are opioid receptor antagonists, specifically the drugs naltrexone and nalmefene.

Over the past 60 years there has been a dramatic change in the treatment of mental health conditions. In the past, people with psychotic disorders were encased in wet sheets. The standard of care has advanced dramatically in recent years. Now, patients with psychotic disorders typically receive a combination of pharmacological and behavioral therapies. The U.S. Food and Drug Administration (FDA) has approved various medications to treat people with schizophrenia or other psychotic disorders. Similarly, FDA-approved medications are available for other psychiatric disorders, including major depression, generalized anxiety disorder, post-traumatic stress disorder, alcohol dependence and nicotine dependence, among others. Despite these advances, there are no FDA-approved medications for pathological gambling (PG). Although this situation places prescribers at a relative disadvantage when treating people with PG, clinicians should be aware of the advances that have been made in pharmacological treatments for PG.

This chapter provides a narrative review of the current status of pharmacological approaches to the treatment of PG, with the aim of providing relevant information that mental health professionals may employ in clinical settings. Even health care providers who do not prescribe drugs should be aware of this information because some of their clients might be under the care of a physician as well. The review will begin with a description of biological features underlying PG, with a focus on brain neurochemistry. This background will provide a foundation for understanding the classes of medications that have been examined in PG. As the data supporting the use of specific medications are discussed, relevant features in evaluating the data (e.g., with respect to the design of the clinical trials) will be described. This is particularly important as a robust placebo response has been observed in PG, and this review will focus on data from placebo-controlled, randomized clinical trials. When considering a patient's responses to medications, individual differences, co-occurring disorders and other clinical characteristics will be described in the context of an emerging pharmacological treatment model. Finally, future directions in treatment development for gambling disorders will be addressed.

TRANSLATING A BIOLOGICAL UNDERSTANDING OF PG INTO PHARMACOLOGICAL ADVANCES

A major effort in psychiatry has involved using improved understandings of the biological underpinnings of specific conditions to generate treatment advances.[1] For PG, this process

is at a relatively early stage. Nonetheless, studies into the neurobiology of the condition have implicated multiple neurotransmitter systems. Based on these findings and those from other studies (e.g., studies of non-gambling behaviors), specific roles for neurochemicals have been proposed as they relate to PG (for a recent review, see [2]). For example, norepinephrine has been implicated in arousal and excitement, serotonin in behavioral initiation and impulse control, dopamine in rewarding and reinforced behaviors and opioids in pleasure and urges.

> "Opiod antagonists are believed to work by affecting the dopamine pathways involved in reward processing and other behaviors."

Roles for other transmitters (e.g., the major excitatory neurochemical glutamate) have also been proposed, in part based on roles in neurocircuitry function underlying motivated behaviors in substance addictions.[3,4] While the proposed roles for the neurochemical systems in PG represent an oversimplification (particularly given the complexities of each neurochemical system and the complex manner in which brain circuits function), they provide a framework for considering pharmacological approaches to PG.

ASSESSING EFFICACY OF MEDICATIONS IN THE TREATMENT OF PG

In clinical settings, it is often difficult to attribute a treatment's success or failure to any specific intervention. As such, for a treatment approach to demonstrate effectiveness, it is important to control for variables that might confound the interpretation of results. That is, to show that a medication is helpful, it should be demonstrated that it is superior to a placebo ("sugar pill") in a carefully controlled trial. Thus, the best data that exist in evaluating pharmacotherapies in the treatment of PG come from clinical trials that are placebo-controlled and conducted in a randomized and double-blinded fashion, with neither the patient nor treatment provider knowing at the time whether an active drug or placebo is being administered. These studies should have a priori defined outcome measures that assess the targeted domains (e.g., problem gambling severity and general clinical outcomes). Given the frequency of placebo response[i] observed in PG (e.g., about 50 percent in some studies[5]), the data from placebo-controlled randomized clinical trials help to disentangle responses attributable to medications from those that may relate to other factors. Such factors that may apply to both active drug and placebo conditions include readiness for change, meeting with a care provider on a regular basis to address a gambling problem, legal, familial or financial matters, or other factors.

Other aspects of trial design, such as inclusionary/exclusionary criteria (i.e., who is included and who is excluded from the trial), fidelity of treatment delivery or compliance, and single site or multi-center involvement, warrant consideration because they may have important implications for the generalizability of findings.[ii]

[i] Sometimes patients given a placebo or "sugar pill" in a clinical trial will have a perceived or actual improvement in a medical condition, a phenomenon commonly called the placebo effect.

[ii] A study's generalizability is the extent to which its findings are likely to translate to other locations and populations that may vary demographically or in other ways. For example, there are several reasons to question whether a treatment that is successful for a population in Boston would be equally beneficial to people in Las Vegas in view of the fact that Boston has a significantly greater number of primary care physicians, psychiatrists, and nearly universal access to health insurance.

IMPACT OF PHARMACOTHERAPIES

Multiple pharmacological treatments for PG have demonstrated promising results. A review of pharmacological treatment trials found that pharmacological interventions in general are helpful for people with PG.[6] Evaluation of specific trials suggests that some approaches have more support than others.[7] Specific medications grouped by classes and linked to neurochemistry findings in PG are described below.

Opioidergic Medications

Arguably the medications with the most empirical support are opioid receptor antagonists or drugs that block opioid receptors, particularly the mu-opioid receptor that is activated by endorphins. The class of opioid antagonist medications includes the drugs naltrexone and nalmefene. Opioid antagonists are believed to work by affecting the dopamine pathways involved in reward processing and other behaviors.[8] Naltrexone is FDA-approved for alcohol and opioid dependence. Given the observations that naltrexone can lead to diminished alcohol cravings and alcohol consumption, it was hypothesized that naltrexone might diminish gambling urges and behaviors among those with PG.[8]

To date, there have been four moderate-to-large placebo-controlled, randomized clinical trials in PG involving opioid antagonists. The first[9] targeted a relatively high dose of naltrexone (up to 250 mg/day, with an end-of-study average dose of 188 mg/day) in a group of individuals with PG who were largely devoid of other psychiatric conditions. The findings demonstrated that naltrexone was superior to the placebo in reducing gambling urges and behaviors and generating overall clinical improvement. However, the high dose of medication was not particularly well-tolerated with respect to liver function.

Consistent with a black box warning (the FDA's label for potential adverse effects of particular clinical importance) for dose-dependent hepatotoxicity (which is typically reversible upon drug discontinuation), 20 to 25 percent of patients receiving naltrexone had elevated liver function tests during the 12-week trial. However, a subsequent trial[10] testing a lower daily dose of naltrexone (including a 50 mg/day dose typically used in the treatment of alcohol dependence) found that this dose appeared effective and well-tolerated. As such, the 50 mg/day dose seems advisable for prescribers to employ in the treatment of people with PG.

Another opioid antagonist, nalmefene, has also been tested in people with PG. Nalmefene was first investigated in PG with the hypothesis that it would show similar efficacy and better tolerability than naltrexone and wouldn't lead to the liver problems. Data from the first multi-center nalmefene study performed across multiple geographic locations found that the drug reduced problem gambling severity and gambling urges and improved general clinical function.[11] Nalmefene was also well-tolerated, both with respect to liver function tests and subjective patient reports.

The best combination of efficacy and tolerability appeared to be with the 25 mg/day dose, one roughly equivalent to 50 mg/day of naltrexone. Similar, albeit somewhat less robust, positive findings were observed in a subsequent trial of nalmefene.[12] However, oral nalmefene is not available in the U.S. and cannot be prescribed in an off-label fashion as one might for naltrexone. (In the U.S., FDA regulations permit physicians to prescribe approved medications for other than their approved indications. This practice is known as "off-label use.")

Another important consideration with selection of pharmacotherapies is the extent to which individual differences might predict treatment outcome. In a study investigating clinical factors associated with treatment outcome with nalmefene or naltrexone, a positive family history of alcoholism was the factor most statistically robustly associated with a better outcome of reduced problem gambling severity.[13]

For a full discussion of the neurobiology of gambling disorders, download the fifth volume of *Increasing the Odds*, titled "Gambling and the Brain," at www.ncrg.org/resources/publications.

The finding that individuals with a familial predisposition to developing alcoholism might respond preferentially to this class of medications suggests that some biological factors might be shared between PG and alcohol dependence that might be effectively targeted with the medication. These findings are consistent with brain imaging findings that show similarities between PG and alcohol dependence in brain "reward" regions like the ventral striatum and function of this region as related to measures of impulsivity.[14,15] Also resonating with findings from the alcohol literature, strong gambling urges at treatment onset were related to better outcome with opioid antagonist treatment. Analyses among participants receiving placebo indicated the most statistically robust relationship existing for age, with older age being associated with a lesser likelihood to respond to placebo. These findings suggest that clinically assessable features might be used to guide pharmacological treatment selection for individual patients.

Serotonin Reuptake Inhibitors

The family of serotonin reuptake inhibitors, including drugs like fluvoxamine (brand name Luvox), paroxetine (brand name Paxil), sertraline (brand name Zoloft) and escitalopram (brand name Lexapro) has shown mixed results in the treatment of PG.[7] Several initial studies targeted relatively high daily doses of these medications. While some trials generated positive results, others were negative, raising the possibility that individual differences might relate importantly to treatment outcome. For example, given that this class of medications appears helpful in targeting disorders like depression and anxiety, perhaps the medications might be most helpful for people with depressive or anxious vulnerabilities.

Preliminary data from a small, open-label study followed by double-blind discontinuation of escitalopram in people with PG and co-occurring anxiety disorders lend support to this idea.[16] Specifically, during open-label treatment, concurrent decreases in anxiety and problem gambling severity were observed. During double-blind discontinuation, randomization to placebo was associated with increased anxiety and problem gambling severity and randomization to active drug was associated with maintenance of gains in these domains. Although preliminary, these findings suggest that co-occurring disorders might be helpful in selecting the most appropriate treatments for people with PG.

Mood Stabilizers

Early investigations into serotonin reuptake inhibitors in the treatment of PG suggested that not only might specific individuals respond better, but that others might respond worse to these medications. Specifically, during treatment with fluvoxamine, several

Some are willing to take an over-the-counter drug or nutritional supplements for gambling disorders. One that has been shown to regulate dopamine function is N-acetyl cysteine.

individuals with co-occurring cyclothymia responded poorly.[17] (Cyclothymic disorder is characterized by similar but milder features of bipolar disorder or manic depressive illness in which a person has mood swings over a period of years that go from mild depression to euphoria and excitement.) These findings suggested that individuals with propensities towards cycling moods might not respond well to this class of medication and perhaps might respond better to mood-stabilizing drugs. Consistent with this idea, a placebo-controlled, randomized clinical trial of individuals with PG and co-occurring bipolar-spectrum disorders found that active lithium was superior to placebo in reducing features of mania and problem gambling severity.[18] This study provides further support for the relevance of specific clinical features in guiding the selection of pharmacological treatments for people with PG.

OTHER MEDICATION CLASSES

Several other medication classes have shown negative findings (i.e. the medication was ineffective) in placebo-controlled randomized clinical trials involving people with PG (see [7]). For example, olanzapine (brand name Zyprexa), a drug with anatagonist properties on serotonin and dopamine receptors, has shown negative results in two trials.[19,20] (For a full description of the neurobiological factors of gambling disorders, see page 6).

Of note, medications with pro-dopamine influences have been associated with PG or other impulse control disorders in Parkinson's disease patients, and these medications include levo-dopa, pramipexole, ropinorole and amantadine.[21-23] However, multiple other factors (marital status, geographic location, personal history of impulse control disorders prior to Parkinson's disease onset and early onset of Parkinson's disease, among others) have also been associated with impulse control disorders in Parkinson's disease. A separate drug with pro-dopaminergic properties has demonstrated no difference from placebo in improving outcome in the treatment of PG.[24] Together and in conjunction with findings that dopamine antagonists appear to promote gambling-related thoughts and behaviors in people with gambling problems and without Parkinson's disease,[25] the findings indicate that multiple clinically relevant aspects of dopamine function in PG are not completely understood.

Researchers have found that topiramate, a mood stabilizing drug with glutamatergic properties, does not appear to be superior to placebo in the treatment of PG.[26] Additional study is needed as to the extent to which responses to specific mood stabilizers differ, as well as how they might differ among specific groups of people with PG (e.g., with and without cycling mood disorders).

OTC: Over-the-Counter Drugs and Nutraceuticals (Dietary Supplements)

In clinical settings, some people may be more willing to take an over-the-counter drug or dietary supplement that can be purchased in a health food store as compared to taking a prescribed medication from a pharmacy. Such nutritional supplements have been termed nutraceuticals (as opposed to pharmaceuticals). One such nutraceutical, n-acetyl cysteine,

has been shown in preliminary studies to have superiority to placebo in the treatment of PG.[27] N-acetyl cysteine is an amino acid derivative that has been shown to have glutamatergic[iii] properties and can regulate dopamine function in the ventral striatum.[iv] The compound is well tolerated; in the treatment of PG, it has been dosed up to 1800 mg/day with mild and typically transient adverse effects.

TOWARDS A PHARMACOLOGICAL TREATMENT MODEL

Based on findings from the placebo-controlled trials described above, my colleague and I have proposed a preliminary pharmacotherapy treatment model for PG to assist clinicians in treatment planning.[7] This approach involves initially determining the willingness of the patient with PG to take a medication for their gambling problem. If the person appears particularly unwilling, clinicians can explore the possibility of a dietary supplement like n-acetyl cysteine. If the person is willing to try a medication, the strongest support exists for an opioid antagonist like naltrexone dosed at 50 mg/day. Prior to and following initiation of treatment and at regular intervals, liver function tests are necessary. Naltrexone may be particularly helpful for those with strong gambling urges at treatment onset and/or a family history of alcoholism.

If bipolar tendencies are present (e.g., cycling moods), then the clinician could consider a mood-stabilizing drug such as lithium. On the other hand, if internalizing features or disorders like anxiety disorders are a salient aspect of the clinical presentation in the absence of cycling mood features, a serotonin reuptake inhibitor like escitalopram warrants consideration. In the absence of a co-occurring disorder, naltrexone appears at the present time to have the most empirical support.

FUTURE DIRECTIONS

While significant advances have been made in the pharmacological treatment of PG, there exist many important unanswered questions and areas for treatment development.

First, although co-occurring disorders appear to represent important individual differences that might be helpful in selecting specific treatments, additional insight into the precise mechanisms could further help in treatment matching. For example, specific variants of the gene coding for the mu-opioid receptor have been linked to opioid antagonist treatment outcome in alcohol dependence,[28] and the extent to which such findings might extend to PG warrants investigation.

Second, other considerations include specific temperamental, behavioral and neurobiological features that might represent vulnerability factors and/or relate to treatment outcome. For example, behavioral and self-report measures of impulsivity and compulsivity have been associated with treatment outcome in PG and might represent relevant treatment targets.[29,30]

[iii] Glutamatergic systems play an important role in almost all physiological functions. Dysfunction of this important neurotransmitter system may also contribute to the pathophysiology of a wide range of disorders, including some major psychiatric disorders. Because glutamatergic dysfunction has been implicated in the pathophysiology of disease states, it has also become a promising target for drug development.

[iv] The ventral striatum is strongly associated with emotional and motivational aspects of behavior. Structural and functional disturbances of ventral striatal areas have been shown to be correlated with various forms of psychopathology, such as schizophrenia, addictive behavior and obsessive-compulsive disorder.

Third, radiochemical studies of PG might identify important relationships between specific receptors or transporters and clinically relevant features of PG, leading to the identification of novel therapeutic targets. For example, serotonin 1B receptor occupancy has been recently associated with problem gambling severity in people with PG.[31] These findings suggest that medications that target this receptor might be helpful for people with PG.

Fourth, brain imaging measures incorporated into clinical trials of medications for PG might provide insight into the precise mechanisms of action of specific treatments as well as help understand who might respond best to specific treatments.[26] Such work in substance addictions has provided insight, and similar studies in PG are underway.[32]

Fifth, most studies of pharmacological treatments for PG have been relatively short-term (several months). Longer trials are needed to examine the durability of treatment responses.

Sixth, studies investigating the combination of behavioral and pharmacological therapies are needed as both approaches have shown promise in clinical trials. These approaches taken together should help enhance the clinical arsenal available to care providers to help people with PG.

About the author…

Marc N. Potenza, M.D., Ph.D., is professor of psychiatry, neurobiology and child study at the Yale University School of Medicine. He served as the principal investigator of one of the first NCRG Centers of Excellence in Gambling Research awarded by the NCRG in 2009.

DISCLOSURE

Dr. Potenza has served as a consultant or advisor to Boehringer Ingelheim, Somaxon, various law offices, and the federal defender's office in issues related to impulse control disorders. He has financial interests in Somaxon. He has received research support from the National Institutes of Health, Veteran's Administration, Mohegan Sun Casino, the National Center for Responsible Gaming, Psyadon, Forest Laboratories, Ortho-McNeil, Oy-Control/Biotie and GlaxoSmithKline. He has participated in surveys, mailings or telephone consultations related to drug addiction, impulse control disorders and other topics. He has provided clinical care in the Connecticut Department of Mental Health and Addiction Services Problem Gambling Services Program. He has performed grant reviews for the National Institutes of Health and other agencies. He has guest-edited journal sections, has given academic lectures in grand rounds, continuing medical education events and other clinical and scientific venues, and has generated book or book chapters for publishers of mental health texts.

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RESOURCES AND PROGRAMS

While research on gambling disorders is still a relatively young field of study, it already is yielding valuable information and guiding practical applications. The NCRG and the American Gaming Association (AGA) offer a variety of programs and tools to increase awareness of gambling disorders and implement responsible gaming practices and programs. A few examples are listed below.

NCRG RESOURCES AND PROGRAMS

NCRG Conference on Gambling and Addiction

Since 1999, the annual NCRG Conference on Gambling and Addiction has brought together researchers, health care providers, regulators, policy makers and gaming industry representatives from around the world. The conference provides a unique forum for these audiences to discuss the latest research advances in the field of gambling and related disorders, and how these findings can be incorporated into practical, real-world applications. Each year, the conference explores a different theme, presenting the most current topics from scientific, clinical, government and industry perspectives. The NCRG conference is held each year in conjunction with Global Gaming Expo, the gaming industry's largest international trade show and conference. More information about the NCRG Conference on Gambling and Addiction is available at www.ncrg.org/conference.

Treatment Provider Workshops

As part of its ongoing public outreach initiatives, the NCRG hosts a national Treatment Provider Workshop Series that allows mental health and addiction treatment providers to better understand the most up-to-date research on gambling disorders and apply those findings to their clinical practice. Each training session features leading researchers and clinicians in the field of gambling disorders, and topics range from screenings and assessments for pathological gambling to new manuals including effective behavioral treatment strategies.

These free workshops are hosted in partnership with various state and regional organizations, and participants can earn continuing education credits from leading certifying organizations by the following organizations: the American Psychological Association, the California Foundation for the Advancement of Addiction Professionals, the California Board of Behavioral Sciences, the National Board for Certified Counselors and NAADAC, the Association for Addiction Professionals. For details on upcoming workshops, visit the NCRG website: www.ncrg.org/public-education-and-outreach/treatment-provider-workshops.

Research and Resources Guide

Research & Resources: A Guide to Gambling Disorders and Responsible Gaming allows quick and easy access to a library of the most significant research findings now available in the field of gambling disorders, providing an overview of key studies by leading researchers. Also included is a guide to the NCRG's and the industry's major responsible gaming education and outreach initiatives, a glossary of commonly used research terms, and helpful online publications and resources. You also will find a list of experts in the field of gambling disorders, who can provide additional information about specific areas of research on gambling disorders. To view the guide, visit www.ncrg.org/press-room/research-and-resources-guide.

Gambling and Health Series

To help educate various stakeholders about this community issue, the NCRG developed the *Gambling and Health* series, including guidebooks and reference sheets that are designed to explain more about pathological gambling, provide resources available to refer to those who may need help and encourage responsible decisions when gambling. Community leaders and members can use these guidebooks for a better understanding about these important issues.

Each guide is created for a different audience. It provides background on the most relevant research relating to gambling disorders and resources that individuals can use in their daily lives to address this issue. It also includes frequently asked questions to better equip professionals to lead discussions about gambling disorders and responsible gaming. The first volume, "Gambling and Health in the Workplace," was developed for human resources and employee assistance professionals. To download the guidebook and reference sheet, visit the NCRG website at www.ncrg.org/gamblingandhealth.

Gambling Disorders 360° and Other Online Resources

Gambling Disorders 360° is the blog for the NCRG that explores the latest news, issues and research relating to gambling disorders and responsible gaming. The blog is also a forum where researchers, clinicians, regulators, policymakers and industry representatives can come together to share knowledge and best practices and discuss the field's most pressing and vital issues. To subscribe to Gambling Disorders 360°, visit http://blog.ncrg.org.

The NCRG is also active on Facebook and Twitter. To connect with the organization on Facebook, visit www.facebook.com/theNCRG. To follow the NCRG on Twitter, visit www.twitter.com/theNCRG.

PEER and *EMERGE* Programs

The Partnership for Excellence in Education and Responsible Gaming (PEER) is a dynamic, one-of-a-kind program created by the NCRG to provide gaming entities with the tools and resources needed to develop a comprehensive and world-class responsible gaming program. The PEER program offers members full access to the blueprint needed to implement the NCRG Code of Conduct for Responsible Gaming, best practices and in depth, how-to instructions to put these words into action. PEER program members also have access to unique employee training opportunities, on-call implementation assistance and an annual report card to demonstrate progress on their initiatives. To learn more about the PEER program and how it can help your organization, visit www.ncrg.org/peerprogram.

The *Executive, Management and Employee Responsible Gaming Education (EMERGE)* program is a science-based, online training program for gaming industry employees developed by Harvard Medical School faculty with support from the NCRG. *EMERGE* is the only program of its kind grounded in scientific research but designed for a lay audience. The self-paced program teaches employees about the nature of addiction, how gambling can become an addiction and the specific responsible gaming policies and practices of their organization. *EMERGE* is an important component of the PEER program. For more information, download the brochure at www.ncrg.org/public-education-and-outreach/peer/elements-peer.

CollegeGambling.org

Building upon the recommendations of the Task Force on College Gambling Policies, the NCRG developed CollegeGambling.org as a tool to help current and prospective students, campus administrators, campus health professionals and parents address gambling and gambling-related harms on campus. The first site of its kind, CollegeGambling.org brings together the latest research and best practices in responsible gaming and the field of addiction awareness and prevention in order to provide a substantive and versatile resource that will help schools and their students address this important issue in the way that best fits each school's needs.

"Talking with Children about Gambling"

"Talking with Children about Gambling" is a research-based guide designed to help parents, as well as others who work with youth, deter children from gambling and recognize possible warning signs of problem gambling and other risky behaviors. The guide was developed in consultation with the Division on Addiction at Cambridge Health Alliance, a teaching affiliate of Harvard Medical School. For more information, download the brochure at www.ncrg.org/public-education-and-outreach/college-and-youth-gambling-programs/talking-children-about-gambling.

"Your First Step to Change"

"Your First Step to Change" is a self-help guide for individuals thinking about changing their gambling behavior. Originally developed as a booklet in 2002 for callers to the Massachusetts Council on Compulsive Gambling's help line, the guide is available in Spanish, Chinese, Khmer and Vietnamese.

Your First Step to Change was developed by the Division on Addiction and the Massachusetts Council on Compulsive Gambling with support from the Massachusetts Department of Public Health and the NCRG. To view the guide, visit www.basisonline.org/self-help_tools.html.

The Brief Biosocial Gambling Screen (BBGS)

The Division on Addictions at Cambridge Health Alliance created the Brief Biosocial Gambling Screen (BBGS) to help people decide on their own whether to seek a formal evaluation of their gambling behavior. Released in 2011, this 3-item survey is based on the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* criteria for pathological gambling. The researchers' objective was to develop a concise screening instrument that would correctly identify the largest proportion of current pathological gamblers and exclude non-pathological gamblers (i.e., reduce the number of false positives). The development of this screen was funded by the NCRG, and it is available online on the NCRG's website at www.ncrg.org/resources.

AMERICAN GAMING ASSOCIATION (AGA) RESOURCES AND PROGRAMS

The AGA Code of Conduct for Responsible Gaming

The AGA and its members pledge to their employees and patrons to make responsible gaming an integral part of our daily operations across the United States. This pledge includes employee assistance and training, alcohol service, the provision of casino games, casino gambling advertising and marketing. The AGA Code of Conduct for Responsible Gaming also covers the commitment of our members to continue support for research initiatives and public awareness surrounding responsible gaming and underage gambling. The brochure, which details how the pledge is fulfilled, can be found at www.americangaming.org/social-responsibility/responsible-gaming/code-conduct.

The AGA Responsible Gaming Statutes and Regulations

The AGA developed a compilation of statutes and regulations regarding responsible gaming in the 20 states that had commercial casinos or racetrack casinos. The content in each section is divided into seven general categories, including Alcohol Service, Credit/Cash Access, Funding/Revenue Sharing (treatment funding), Self-exclusion, Signage/Help Line/Advertising, Training/Education (employee training, employee responsible gaming prevention, public awareness) and Miscellaneous (loss limits/limited stakes, direct mail/marketing). To view the publication, visit www.americangaming.org/industry-resources/research/responsible-gaming-statutes-and-regulations.

"The House Advantage: A Guide to Understanding the Odds"

This publication explains the house advantage, providing typical ranges for specific games, along with other factors that should be taken into account when betting on casino games, such as the amount wagered, the length of time played and, to a degree, a player's skill level. It also debunks common myths about gambling and provides an explanation of regulatory procedures in place to ensure all the games in a casino are fair. To view this brochure, visit www.americangaming.org/social-responsibility/responsible-gaming/understanding-games.

"Taking the Mystery Out of the Machine: A Guide to Understanding Slot Machines"

While a significant majority of gamblers say slot machines are their favorite form of casino entertainment, most people know very little about how slots are developed or how they work. "Taking the Mystery Out of the Machine: A Guide to Understanding Slot Machines" provides digestible information about how slots are operated, developed and regulated and uses common language to debunk many players' most widely held myths about slot machines. The resource has been made available to patrons and employees as an important part of many casinos' standard responsible gaming education efforts. To download a free copy of the brochure, visit www.americangaming.org/social-responsibility/responsible-gaming/understanding-games.

ABOUT THE NCRG

The National Center for Responsible Gaming (NCRG) is the only national organization exclusively devoted to public education and funding research that will help increase understanding of pathological and youth gambling and find effective methods of treatment for the disorder. The NCRG is the American Gaming Association's (AGA) affiliated charity.

Founded in 1996 as a separate 501(c)(3) charitable organization, the NCRG's mission is to help individuals and families affected by gambling disorders by supporting the finest peer-reviewed, scientific research into pathological and youth gambling; encouraging the application of new research findings to improve prevention, diagnostic, intervention and treatment strategies; and advancing public education about gambling disorders and responsible gaming.

Almost $25 million has been committed to the NCRG through contributions from the casino gaming industry, equipment manufacturers, vendors, related organizations and individuals. Since its founding, the NCRG has mandated stringent firewalls to separate the gaming industry's contributions from the research it funds.

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Andrew Zarnett
Managing Director
Deutsche Bank Securities

STAFF

Christine Reilly
Senior Research Director
978-338-6610
creilly@ncrg.org
Contact for research on gambling disorders and information on NCRG research grants.

Nathan Smith
Program Officer
978-338-6610
nsmith@ncrg.org
Contact for research on gambling disorders.

Amy Kugler
Communications and Outreach Manager
202-552-2689
akugler@ncrg.org
Contact for members of media interested in speaking with NCRG board members or research experts.

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Washington, D.C. Office
1299 Pennsylvania Avenue, NW, Suite 1175
Washington, DC 20004
202-552-2689

Boston Office
900 Cummings Center, Suite 418-U
Beverly, MA 07915
978-338-6610