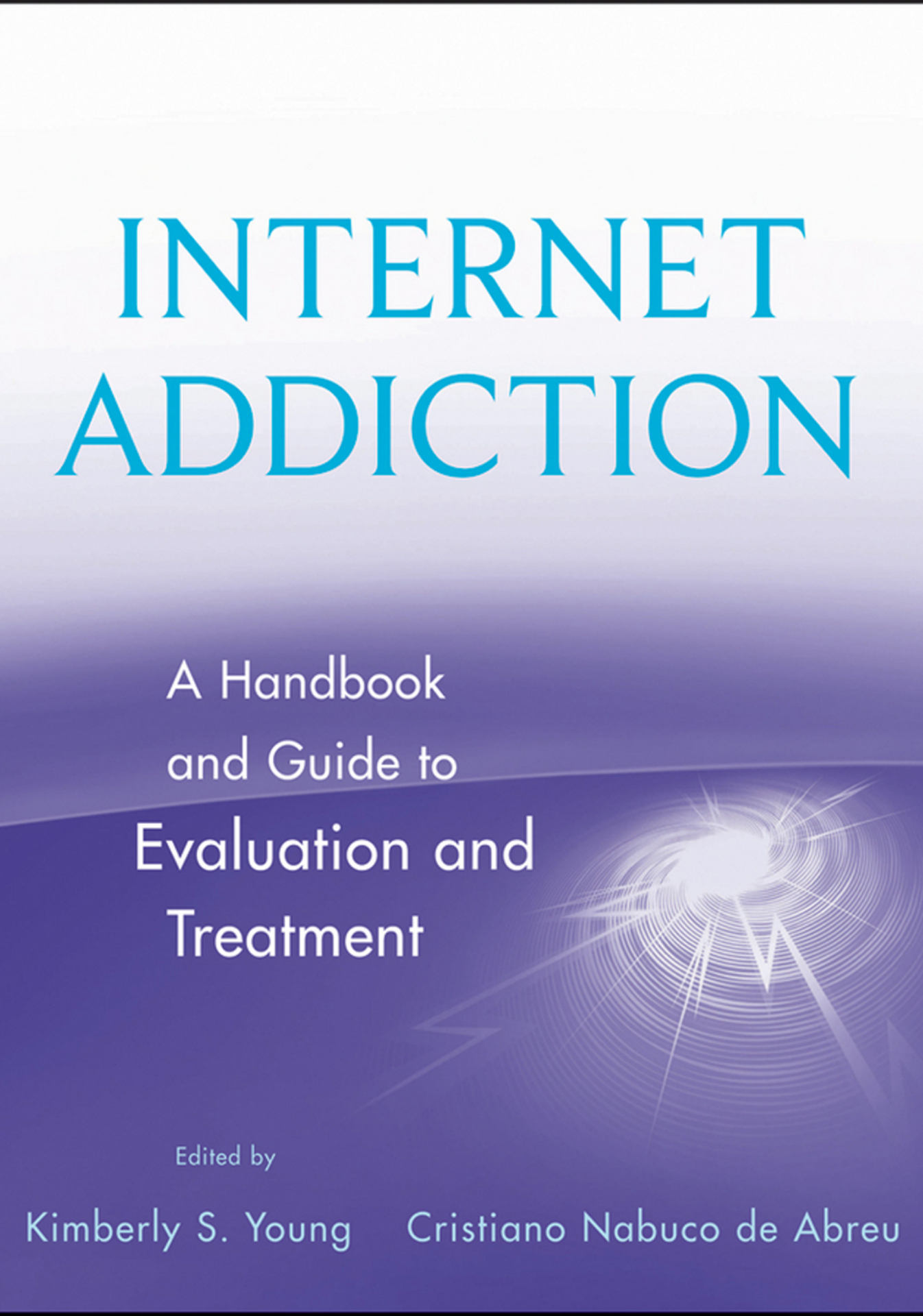
INTERNET ADDICTION

A Handbook and Guide to Evaluation and Treatment



Edited by

Kimberly S. Young Cristiano Nabuco de Abreu

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Foreword

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THE INTERNET has exploded to become a daily part of our lives. For the majority of individuals, the Internet represents an incredible information tool and unquestionable opportunity for social connectedness, self-education, economic betterment, and freedom from shyness and paralyzing inhibitions. For them, the Internet enhances their well-being and quality of life. For others, however, it can lead to a state that appears to meet the *DSM* definition of a mental disorder described as "a clinically significant behavioral or psychological syndrome associated with present distress or with a significantly increased risk of suffering death, pain, disability, or an important loss of freedom" (American Psychiatric Association, 2000).

Dr. Kimberly Young, co-editor of this volume, was the first to bring clinical attention to this issue when she published a 1996 case report of problematic Internet use (Young, 1996). Her patient was a non–technologically oriented 43-year-old homemaker with a content home life and no prior addiction or psychiatric history, who within three months of discovering chat rooms was spending up to 60 hours per week online. The patient reported feeling excited in front of the computer and dysphoric and irritable when she would log off. She described having an addiction to the medium like one would to alcohol.

Since that report, a sizable and informative body of data originating in the East and West has accumulated over the past decade. Taken as a whole, the data tell a cautionary tale of the Internet's real potential to cause psychological harm. Research studies have documented a variety of subtypes of Internet-related problems such as online sexual compulsivity, Internet gambling, MySpace addiction, and video game addiction, which the American Medical Association estimates five million children suffer from and once considered calling gaming overuse an addiction in its revised diagnostic manual.

The problem of Internet addiction is still relatively new, and while research has documented what has become a growing health care problem, no current books pull this body of literature together. *Internet Addiction: A Handbook and Guide to Evaluation and Treatment* offers the first empirically based book to

address this emergent field. This book summarizes the research conducted to date and proposes clinical, societal, and public health interventions that target the general population as well as adolescents—a group deemed at higher risk for developing the problems discussed. This book will enable practitioners to learn about the contemporary and current clinical implications, assessment methods, and treatment approaches in screening and working with clients who suffer from this new addictive disorder.

For a medium that has so radically and irreversibly changed the way we conduct our lives, the Internet's effects on our psychological health remain understudied, talked about more by sensationalism-driven reporters than practicing clinicians or expert researchers. And even as our understanding of basic Internet psychology lags, symptoms are changing as the technology evolves—from traditional browsers to smart phones that combine Internet capability with talking, texting, and video games. Simply stating that similar fears have been raised with every new technology misses the point: The immersive and interactive qualities of the virtual medium, combined with its sheer penetration into every aspect of life, make it different from all media forms that preceded it, and more prone to overuse or misuse. As our dependency on technology grows, this book adds to the clinical legitimacy and raises public and professional awareness of the problem that will enable future research in this evolving field to be conducted. This field is rapidly developing with new areas of scientific exploration, which is why research-driven books that educate us about the problems inherent in the virtual world are such a necessity.

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Acknowledgments

SOME SAY that the knowledge we'll accumulate over the next five years will be greater than that collected throughout the history of mankind up until now. Surely a little more than a decade ago we would doubt this statement—imagining it was the result of exaggeration and faulty perspective. We were still using fax machines and watching movies on videocassette tapes, and the computer still was an object of both wonder and suspicion. But if we consider that the cell phones we carry reflect more sophisticated technology than the one in the Apollo 12 spacecraft, it may be that the outrageous-sounding prediction was correct.

We are at the epicenter of a major change in the history of science. We can be eyewitnesses to a great revolution in the field of knowledge and human behavior. There are many implications stemming from these changes, among them the consequences of this technology's effects on everyday life. Reliance on the Internet has emerged as one of the issues challenging society, families, clinicians, and researchers. This book can shed some light on this subject, even though very little is yet known about the long-term implications of this new communication system. We hope this book helps professionals who work to relieve the suffering that the improper use of the Internet has brought to millions of people. This book is dedicated to those sufferers.

We would also like to thank Patricia Rossi and Fiona Brown at John Wiley & Sons and our agent, Carol Mann at the Carol Mann Literary Agency. They supported us and believed in our project.

KIMBERLY S. YOUNG, PHD
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About the Editors

DR. KIMBERLY S. YOUNG is an internationally known expert on Internet addiction and online behavior. Founded in 1995, she serves as the clinical director of the Center for Internet Addiction Recovery and travels nationally conducting seminars on the impact of the Internet. She is the author of *Caught in the Net*, the first book to address Internet addiction, translated in six languages, *Tangled in the Web* and her most recent, *Breaking Free of the Web: Catholics and Internet addiction*. She is a professor at St. Bonaventure University and has published over 40 articles on the impact of online abuse.

Her work has been featured in *The New York Times, The London Times, USA Today, Newsweek, Time, CBS News, Fox News, Good Morning America*, and ABC's *World News Tonight*. She has been an invited lecturer at dozens of universities and conferences including the European Union of Health and Medicine in Norway and the First International Congress on Internet Addiction in Zurich. She serves on theeditorial board of CyberPsychology & Behavior and the International Journal of Cyber Crime and Criminal Justice. In 2001 and 2004, she received the Psychology in the Media Award from the Pennsylvania Psychological Association and in 2000 she received the Alumni Ambassador of the Year Award for Outstanding Achievement from Indiana University at Pennsylvania.

DR. CRISTIANO NABUCO DE ABREU is a psychologist who has a PhD in Clinical Psychology from the University of Minho (UM) in Portugal with a Postdoctoral Fellow in the Department of Psychiatry, Hospital das Clinicas, Faculty of Medicine, University of São Paulo (USP). He has experience in Cognitive Therapy and Internet addiction, and coordinates the Internet Addicts Program of the Impulse Disorders Clinic (AMITI) of the Institute of Psychiatry, Faculty of Medicine, University of São Paulo. With a pioneering work method in Brazil and Latin America, the unit has offered therapy sessions and counseling to adults, adolescents, and their family members since 2005. Dr. Nabuco de Abreu has also published numerous articles in Portuguese for various journals.

He is the ex-president of the Brazilian Society of Cognitive Therapies (SBTC) and is a member of the Advisory Board of the Society for Constructivism in Human Science (USA). He is the author of numerous scientific articles and seven books on Mental Health, Psychotherapy, and Psychology, including, *Cognitive Therapy and Cognitive Behavior Therapy*, *Psychiatric Disorders: Diagnostic and Interview for Health Professionals*, and *Clinical Handbook for Impulse Control Disorders*, among others.

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Introduction

OVER THE past decade, the concept of Internet addiction has grown in terms of its acceptance as a legitimate clinical disorder often requiring treatment (Young, 2007). Hospitals and clinics have emerged with outpatient treatment services for Internet addiction, addiction rehabilitation centers have admitted new cases of Internet addicts, and college campuses have started support groups to help students who are addicted. Most recently, the American Psychiatric Association has decided to include the diagnosis of Internet addiction in the Appendix in the *DSM-5* as further studies are conducted.

Internet Addiction: A Handbook and Guide to Evaluation and Treatment focuses on the current research in the field intended for academic and clinical audiences. The first study on Internet addiction occurred in 1996 by Dr. Kimberly Young when she presented her findings on 600 subjects who met a modified version of the *DSM* criteria for pathological gambling. The paper, "Internet Addiction: The Emergence of a New Disorder," was presented at the American Psychological Association's annual conference held in Toronto. While controversial at first, with academics debating the existence of the problem, since then empirical research on Internet addiction has grown substantially.

New studies across cultures and across academic disciplines have focused on understanding this new clinical and social phenomenon. New studies have furthered our understanding of Internet behavior and how adolescents and adults have come to use this new technology. New clinical studies have attempted to understand diagnosis, psychosocial risk factors, symptom management, and treatment of this new disorder. Internet addiction has been identified as a national problem not only in the United States but also in countries such as China, South Korea, and Taiwan, and government intervention has grown to battle Internet addiction and what has become a serious public health concern.

It is difficult to determine how widespread the problem is. One national study that originated from a team at the Impulse Control Disorders Clinic at Stanford University School of Medicine estimated that one in eight Americans suffers from at least one indicator of problematic Internet use. In other countries such as China, South Korea, and Taiwan, media reports suggest that Internet addiction has reached epidemic proportions.

During the late 1990s, research on Internet addiction grew. Health care professionals started seeing cases of people who suffered from Internet-related clinical problems. Pioneer treatment centers specializing in Internet addiction recovery emerged at McLean Hospital in the Boston area (a Harvard Medical School affiliate) and at the Illinois Institute for Addiction Recovery at Proctor Hospital in Peoria, Illinois. Inpatient addiction rehabilitation centers such as the Betty Ford Clinic, Sierra Tucson, and The Meadows started to include Internet-related compulsivity as one of the subspecialties they treated. Globally, the first inpatient treatment center opened in Beijing, China, in 2006, and today, it is estimated that South Korea has more than 140 Internet addiction treatment recovery centers.

Research has also studied subtypes of Internet-related problems such as online sexual compulsivity, Internet gambling, MySpace addiction, and video game addiction. Video game addiction had become such a concern that in 2008 the American Medical Association estimated that five million children suffered from an addiction to games and considered calling gaming overuse an addiction in its revised diagnostic manual.

While much attention has been paid to Internet addiction in the academic and clinical fields, developing universal standards of care and assessment have been difficult because the field is culturally diverse and terminology in the academic literature has varied from Internet addiction to problematic Internet use, pathological Internet use, and pathological computer use, in the same way that different inventories are used for their assessment. With our reliance on technology, trying to define Internet addiction is even more difficult as we blur the boundaries between needing and wanting to use the Internet. We need to use the technology, so the question is: When is it an addiction?

The problem of Internet addiction is relatively new, and while research has documented what has become a growing health care problem, scientific understanding of the problem is evolving. *Internet Addiction: A Handbook and Guide to Evaluation and Treatment* is the first comprehensive compilation of the current research to address this emergent field. The book is inclusive of both online and computer-related compulsions, making it relevant to a wide audience. Scholars searching for specific information on the latest research on Internet addiction and current trends in the field will find this book useful. Practitioners from a variety of fields, including social work, addiction counseling, psychology, psychiatry, and nursing in search of empirically based assessment and treatment methods will also find this book useful regarding evidence-based approaches.

The first part of the book provides a theoretical framework to understand how to define and conceptualize compulsive use of the Internet from a clinical perspective. The book includes various theoretical models from the psychiatric, psychological, communication, and sociological fields. Leading researchers from various countries explore the global and cultural impact of Internet addiction and combine these fields to conceptualize diagnosis of

Internet addiction and its prevalence. To further help therapists diagnose Internet addiction, this book examines the epidemiology and subtypes of Internet addiction such as online pornography, Internet gambling, and online games. The book also examines the impact of Internet use on children, individuals, and families, as well as risk factors that have been associated with the development of the disorder.

The second part of the book examines assessment and treatment of Internet addiction. As computers are relied upon with great frequency, health care professionals may be confronted with new cases of problem computer users. Yet, given the popularity of computer use, detecting the disorder may be difficult. Signs of a problem may easily be masked by legitimate use of the Internet, and clinicians may overlook signs because it is still a relatively new condition. Therefore, the book outlines assessment strategies to screen for and evaluate the presence of addictive use of the Internet, including clinical interview questions to ask, and describes the Internet Addiction Test, the first psychometrically validated measure of problematic Internet use (Widyanto & McMurren, 2004). Also, utilizing treatment outcome data, the book explores evidenced-based treatment approaches from a variety of clinical perspectives, including child and adult interventions, group therapy, 12-step recovery, and inpatient rehabilitation.

Finally, the implications of including the diagnosis of Internet addiction in the *DSM-5* are many. Its inclusion in the Appendix of the *DSM-5* would raise clinical legitimacy of the disorder to a higher level and would allow further scientific understanding of the nature of Internet addiction to be studied. The concluding chapter explores these implications and how greater public awareness and recognition of Internet addiction would bring new opportunities for future research funding on treatment and training. The concluding chapter also explores further areas for research such as long-term treatment outcomes and systematic comparisons of various treatment modalities to determine their therapeutic efficacy. We hope as the field continues to grow and evolve that this book opens an important dialogue for practitioners and scholars alike. We hope this book will enable practitioners to learn about the contemporary and current treatment approaches in screening and working with clients who suffer from this condition. We also hope this book serves as a resource guidebook for clinics, hospitals, inpatient rehabilitation centers, and outpatient treatment settings. Last, we hope it offers academics pursuing further research in the area of Internet addiction and online behavior a compendium of resources relevant to the contemporary literature in the field.

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PART I

Understanding Internet Behavior and Addiction

CHAPTER 1

Prevalence Estimates and Etiologic Models of Internet Addiction

KIMBERLY S. YOUNG, XIAO DONG YUE, and LI YING

INTERNET ADDICTION was first researched in 1996, and findings were presented at the American Psychological Association. The study reviewed over 600 cases of heavy Internet users who exhibited clinical signs of addiction as measured through an adapted version of the *DSM-IV* criteria for pathological gambling (Young, 1996). Since then, subsequent studies over the past decade have examined various aspects of the disorder. Early studies attempted to define Internet addiction and examined behavior patterns that differentiated compulsive from normal Internet usage. More recent studies examined the prevalence of Internet addiction and investigated the etiologic factors or causes associated with the disorder. Much of this examined the impact of computer-mediated communication on the way people will adapt to interactive features of the Internet, and initial studies from the United States spread into the United Kingdom and countries such as Russia, China, and Taiwan. As the problem has become more widespread, little is still understood as to the reasons why people become addicted to the Internet. This chapter presents the data associated with prevalence of Internet addiction, as available in various countries, to gather a sense of the scope of the problem. The chapter also provides the theoretical frameworks to understand the etiologic models or causal factors associated with the development of Internet addiction. From the academic perspective, this chapter helps identify future areas of research as new studies in the field continue to emerge. From the mental health perspective, the chapter will assist clinicians in developing more empirically sound methods to assess and potentially treat Internet-addicted clients.

PREVALENCE ACROSS CULTURES

Early research has investigated the prevalence of addictive use of the Internet. In one of the first studies, Greenfield (1999) partnered with ABCNews.com to survey Internet users. From 17,000 responses, the study estimated that 6% of Internet users fit the profile of Internet addiction. While this study relied on self-reported data, it did include a cross-sectional population and was considered one of the largest psychological surveys conducted solely on the Internet. Another well-known U.S. study, conducted by a team of researchers at Stanford University Medical Center, found that one in eight Americans suffered from one or more signs of Internet addiction (Aboujaoude, Koran, Gamel, Large, & Serpe, 2006).

Studies among college populations showed slightly higher prevalence rates than found in the general population of Internet users. Using various versions of the *DSM*-based criteria, at the University of Texas, Scherer (1997) found 13% of 531 campus students surveyed exhibited signs of Internet dependency. Morahan-Martin and Schumacher (1999) found that 14% of students at Bryant College in Rhode Island met the criteria, and Yang (2001) estimated that 10% of students met the criteria at the University of Taiwan. Conclusions suggested that college students had easier access to the Internet and it was more encouraged, contributing to the higher prevalence of addictive use on campuses.

Among adolescents, a study in Finland investigated the prevalence of Internet addiction among 12- to 18-year-olds. Findings suggested that 4.7% among girls met the definition of Internet addiction as assessed by Young's Internet Addiction Diagnostic Questionnaire (1998), and of boys 4.6% met the definition. Studies related to the prevalence of specific types of Internet abuse also emerged by the late 1990s. Studies on online sexual activities were the most prevalent, and estimates based on survey data showed that 9% of users fit signs of addiction related to sexually explicit material on the Internet (Cooper, 2002).

In 2001, Bai, Lin, and Chen reported the results of a survey to determine the prevalence of Internet addiction disorder among visitors to a virtual mental health clinic where 100 volunteer mental health professionals provide, at no charge, online answers to visitors' questions about mental problems. During the study period all visitors to the virtual clinic completed Young's eight-item Internet Addiction Diagnostic Questionnaire. Among the 251 clients, 38 clients or 15% met criteria for Internet addiction disorder. Clients who met the criteria did not differ significantly from those who did not in age, gender, education, marital status, occupation, or impending diagnosis. However, the rate of comorbid substance use disorder was significantly higher among clients who met the criteria for Internet addiction disorder than among those who did not.

In 2003, Whang, Lee, and Chang investigated the prevalence of Internet overuse in Korea. They used a modified version of Young's Internet Addiction

Scale, and 13,588 users (7,878 males, 5,710 females), out of 20 million from a major portal site in Korea, participated in this study. Among the sample, 3.5% had been diagnosed as Internet addicts (IAs), while 18.4% of them were classified as possible Internet addicts (PAs).

A study, I-Cube 2006, conducted by the Internet & Mobile Association of India, covering 65,000 individuals by household survey in 26 cities in India, says that about 38% of Internet users in that country have shown signs of heavy usage (about 8.2 hours per week). Young males, especially college students, form the major chunk of Internet user base. Indians go online for a number of activities, including e-mail and instant messaging (98%), job search (51%), banking (32%), bill payment (18%), stock trading (15%), and matrimonial search (15%).

There are limited numbers of studies estimating how common the issue of Internet addiction is in India. Kanwal Nalwa, PhD, and Archana Preet Anand, PhD, of the department of psychology, Punjabi University in India, conducted a study for preliminary investigation of the extent of Internet addiction in schoolchildren 16 to 18 years old in India (Nalwa & Anand, 2003). They identified two groups, dependents and nondependents. Dependents were found to delay other work to spend time online, lose sleep due to late-night logons, and feel life would be boring without the Internet. Not surprisingly, dependents spent more time online and scored higher on loneliness measures than the nondependents.

The understanding that Internet use can be a disorder is still in its initial stages in India. Since 2007, certain educational institutions, such as the Indian Institutes of Technology (IITs), a group of leading engineering universities, have been restricting campus Internet use during night hours because of reports of some suicides being linked to the presumed antisocial behavior that excessive Internet use promotes (Swaminath, 2008).

According to the most recent Statistical Report on Internet Addictions in China (Cui, Zhao, Wu, & Xu, 2006) by the China Youth Association for Internet Development, adolescent Internet addicts in China make up about 9.72% to 11.06% of the total number worldwide of adolescent Internet users. Specifically, of 162 million Internet users in China, those users who are younger than 24 years old occupy approximately 63% of the total number of Internet users, which amounts to about 100 million. Of these 100 million young users, about 9.72% to 11.06% are serious addicts, amounting to about 10 million young people.

Prevalence statistics vary widely across cultures and societies. In part, researchers are utilizing various instruments to define Internet addiction, making it harder to have consistency across studies. Further, these studies are confounded by various methodologies, some using online survey data posted to the World Wide Web using cross sections of populations, and some only targeting a specific campus or university. Generally, we can say that it seems that the prevalence of Internet addiction is the lowest among adolescents, with ranges of 4.6 to 4.7%. That number goes up among the general

population of Internet users, with ranges of 6 to 15% of the general population fitting the signs of addiction; and it goes up to 13 to 18.4% among college students, who appear to be the most at risk. These numbers estimate the scope of the problem and suggest that a significant proportion of online users may suffer one or more signs of Internet addiction.

ETIOLOGIC FACTORS

Addictions are defined as the habitual compulsion to engage in a certain activity or utilize a substance, notwithstanding the devastating consequences on the individual's physical, social, spiritual, mental, and financial well-being. Instead of addressing life's obstacles, tackling daily stress, and/or confronting past or present trauma, the addict responds maladaptively by resorting to a pseudo coping mechanism. Typically, addiction manifests both psychological and physical characteristics. Physical dependence occurs when an individual's body develops a dependence on a certain substance and experiences withdrawal symptoms upon discontinuing the consumption, such as drugs or alcohol. While initially an addictive substance induces pleasure to the user, his or her continued consumption is driven more by a need to eliminate the anxiety brought about by its absence, thus leading the individual to compulsive behavior. Psychological dependency becomes evident when the addict experiences withdrawal symptoms such as depression, cravings, insomnia, and irritability. Both behavioral addiction and substance addiction usually give rise to psychological dependence. The following outlines various models proposed to explain Internet addiction related to the psychological dependency. As a behavioral addiction, the focus on psychological issues that increase consumption of the Internet is helpful to aid in clinical understanding of why people overuse.

Cognitive-Behavioral Model

Caplan (2002) viewed technological addictions as a subset of behavioral addictions; Internet addiction featured the core components of addiction (i.e., salience, mood modification, tolerance, withdrawal, conflict, and relapse). From this perspective, Internet addicts displayed a salience for the activity, often experiencing cravings and feeling preoccupied with the Internet when offline. He also suggested that using the Internet as a way to escape troubling feelings, developing a tolerance for the Internet to achieve satisfaction, experiencing withdrawal when reducing Internet use, suffering from increased conflicts with others because of the activity, and relapsing back to the Internet were also signs of addiction. This model has been applied to behaviors such as sex, running, food consumption, and gambling (Peele, 1985; Vaillant, 1995) and is useful to examine pathological or addictive Internet use.

Davis (2001) introduced a cognitive-behavioral theory of pathological Internet use (PIU) that attempts to model the etiology, development, and outcomes

associated with PIU. Davis characterizes PIU as more than a behavioral addiction; instead he conceptualizes PIU as a distinct pattern of Internet-related cognitions and behaviors that result in negative life outcomes. Davis proposes that there are two distinct forms of PIU: specific and generalized. Specific PIU involves overuse or abuse of content-specific functions of the Internet (e.g., gambling, stock trading, viewing pornography). Moreover, Davis argues that such stimuli-specific behavioral disorders would likely be manifested in some alternative way if the individual were unable to access the Internet. Generalized PIU is conceptualized as a multidimensional overuse of the Internet itself that results in negative personal and professional consequences. Symptoms of generalized PIU include maladaptive cognitions and behaviors related to Internet use that are not linked to any specific content. Rather, generalized PIU occurs when an individual develops problems due to the unique communication context of the Internet. In other words, the person is drawn to the experience of being online in and of itself, and demonstrates a preference for virtual, rather than face-to-face, interpersonal communication.

Within this context, researchers have suggested that moderated and controlled use of the Internet is most appropriate to treat Internet addiction (Greenfield, 2001; Orzack, 1999). Specifically, cognitive behavioral therapy (CBT) has been suggested as the preferred mode of therapy treatment for compulsive Internet use (Young, 2007). CBT is a familiar treatment based on the premise that thoughts determine feelings. In one study of 114 patients, CBT was used to teach patients to monitor their thoughts and identify those that trigger addictive feelings and actions while they learn new coping skills and ways to prevent a relapse. CBT required three months of treatment or approximately 12 weekly one-hour sessions. The early stage of therapy is behavioral, focusing on specific behaviors and situations where the impulse-control disorder causes the greatest difficulty. As therapy progresses, there is more of a focus on the cognitive assumptions and distortions that have developed and the effects of the compulsive behavior.

Specifically, research suggests that the focus of recovery should examine both computer behavior and noncomputer behavior (Hall & Parsons, 2001). Computer behavior deals with actual online usage with a primary goal of abstinence from problematic applications while retaining controlled use of the computer for legitimate purposes. For example, a lawyer addicted to Internet pornography would need to learn to abstain from adult web sites, while still being able to access the Internet to conduct legal research and to e-mail clients. Noncomputer behavior focuses on helping clients develop positive lifestyle changes for life without the Internet. Life activities that do not involve the computer, such as offline hobbies, social gatherings, and family activities, are encouraged. Similarly to food addiction, where recovery can be objectively measured through caloric intake and weight loss, online addicts can objectively measure success through maintaining abstinence from problematic online applications and increasing meaningful offline activities. Once a baseline has been established, behavioral therapy is used to relearn how to

use the Internet to achieve specific outcomes, such as moderated online usage and more specifically abstinence from problematic online applications and controlled use for legitimate purposes. Behavior management for both computer usage and adaptive noncomputer behavior focuses on current online behavior.

From a cognitive perspective, addictive thinkers will for no logical reason feel apprehensive when anticipating disaster (Hall & Parsons, 2001). While addicts are not the only people who worry and anticipate negative happenings, they tend to do this more often than other people. Young (1998) first suggested that this type of catastrophic thinking might contribute to compulsive Internet use in providing a psychological escape mechanism to avoid real or perceived problems. Subsequent studies hypothesized that other maladaptive cognitions such as overgeneralizing or catastrophizing and negative core beliefs also contribute to compulsive use of the Internet (Caplan, 2002; Caplan & High, 2007; Davis, 2001; LaRose, Mastro, & Eastin, 2001). Those who suffer from negative thinking often suffer from low self-esteem and maintain pessimistic attitudes. They may be the ones drawn the most to the anonymous interactive capabilities of the Internet in order to overcome these perceived inadequacies. Early treatment outcome studies show that CBT can be used to address these negative thoughts to overcome their personal feelings of low esteem and worth (Young, 2007). The cognitive model helps to explain why Internet users develop a habit or compulsive use and how negative self-thoughts maintain patterns of compulsive behavior.

Neuropsychological Model

Scholars from mainland China have paid increasing attention to the problem of Internet addiction in Chinese society. In its 2005 report, the China Youth Association for Network Development (CYAND) puts forward, for the first time, a standard to judge the Internet addiction as having one prerequisite and three conditions (CYAND, 2005). The prerequisite is that the Internet addiction must severely jeopardize a young person's social functioning and interpersonal communication. An individual would be classified as an Internet addict as long as he or she meets any one of the following three conditions: (1) one would feel that it is easier to achieve self-actualization online than in real life, (2) one would experience dysphoria or depression whenever access to the Internet is broken or ceases to function; (3) one would try to hide his or her true usage time from family members. Ying, director of the Institute of Psychological Development for the CYAND, has proposed a neuropsychological chain model to account for the Internet-addictive behavior (Tao, Ying, Yue & Hao, 2007) (see Figure 1.1 and Table 1.1).

When examining the primitive drive associated with addiction, much of research stems from brain behavior related to chemical dependency. The pharmacological activation of brain reward systems is largely responsible for producing a drug's potent addictive properties. Personality, social, and genetic

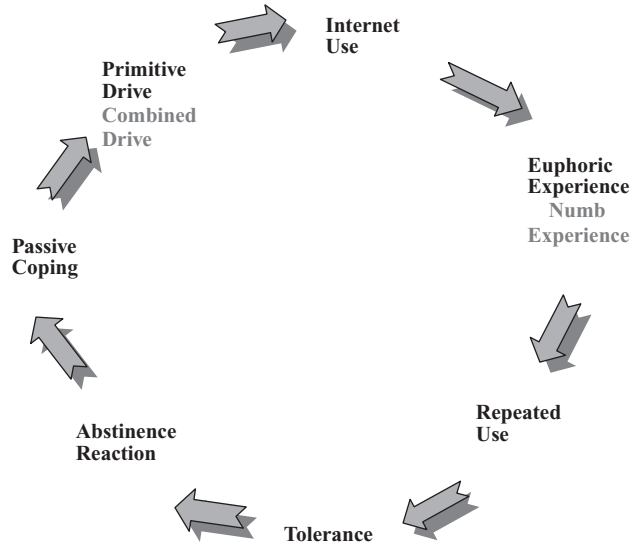

Figure 1.1 Neuropsychological chain model of Internet addiction

Table 1.1
Explanation of the Neuropsychological Link of Internet Addiction

Main Concept	Specific Explanation
Primitive drive	The instinct of an individual to pursue pleasure and avoid pain, which is representative of various motives and impulses to use the Internet.
Euphoric experience	The Internet activities stimulate the central nervous system of the individual, who will feel happy and satisfied. The feeling will drive the individual to continuously use the Internet and extend euphoria. Once addiction is formed, the euphoric experience will soon be transformed into a habit and numbness state.
Tolerance	Because of repeated use of the Internet, the sensory threshold of the individual increases; in order to achieve the same happy experience, the user must increase time and passion. High-level tolerance is the springboard for Internet addiction and the result of reinforcement of euphoric experience concerning the Internet.
Abstinence reaction	The physical and psychological syndromes happen once the individual stops or after decreased Internet use, mainly including dysphoria, insomnia, emotional instability, irritability, and so on.
Passive coping	Passive behaviors accommodating to the environment form once the individual is confronted with frustration or receives outside harmful effects, which include passive behaviors such as adverse event imputation, cognition falsification, and the formed suppression, escape, and aggression.
Avalanche effect	The avalanche effect includes passive experience consisting of tolerance and abstinence reaction, and combined drive consisting of individual passive coping styles on the basis of the primitive drive of the individual.

factors may also be important, but the drug's effects on the central nervous system (CNS) remain the primary determinants of drug addiction. Nonpharmacological factors are likely to be important in influencing initial drug use and in determining how rapidly an addiction develops. For some substances, nonpharmacological factors may interact with the drug's pharmacological action to produce compulsive substance use. In these cases, addictive behavior may involve use of substances that are generally not considered addictive.

Dopamine is one of a number of neurotransmitters found in the central nervous system. Dopamine has received special attention from psychopharmacologists because of its apparent role in the regulation of mood and affect and because of its role in motivation and reward processes. Although there are several dopamine systems in the brain, the mesolimbic dopamine system appears to be the most important for motivational processes. Some addictive drugs produce their potent effects on behavior by enhancing mesolimbic dopamine activity (Di Chiara, 2000). The neurochemical connection to behavioral addictions such as gambling or food have yet to be made, but early studies have suggested that neurochemical processes play a role in all addiction, whether to substances or to behaviors (Di Chiara, 2000).

The proposed model of brain reward circuitry in addiction involves the increase of dopamine when certain areas of the brain are stimulated. The brain has specialized pathways that mediate reward and motivation. Direct electrical stimulation of the medial forebrain bundle (MFB) produces intensely rewarding effects. Psychomotor stimulants and opiates can also activate this reward system by their pharmacological actions in the nucleus accumbens and ventral tegmental area, respectively. The ventral tegmental action of opiates probably involves an endogenous opioid peptide system (ENK), but the anatomical location of that system has not yet been identified. Natural rewards (e.g., food, sex) and other substances (e.g., caffeine, ethanol, nicotine) may also activate this brain reward system (Di Chiara, 2000).

As we discover new areas of neurochemical processes in addictive behavior, it is essential to understand the physical and psychological effects. Researchers have long associated addiction with changes in neurotransmitters in the brain, and some theorists have argued that all addiction, independent of type (sex, food, alcohol, the Internet), can be triggered by similar changes in the brain. To this end, new studies have been conducted on pharmacological treatments of Internet addiction. At Mount Sinai School of Medicine in New York, researchers tested the use of the antidepressant escitalopram (Lexapro, from Forest Pharmaceuticals) in 19 adult subjects who had impulsive-compulsive Internet usage disorder, defined as time-consuming and uncontrollable, or distressing Internet usage resulting in social, occupational, or financial difficulties (Dell'Osso et al., 2008). Study participants took escitalopram in an open-label phase for 10 weeks, and then those who responded were randomized in a double-blind, placebo-controlled nine-week phase to continue with this drug or switch to a placebo. During the open-label phase, addicts had a very healthy response to the drug; on average, the number of hours spent