INTERNET ADDICTION DISORDER: A CASE STUDY OF CHINA

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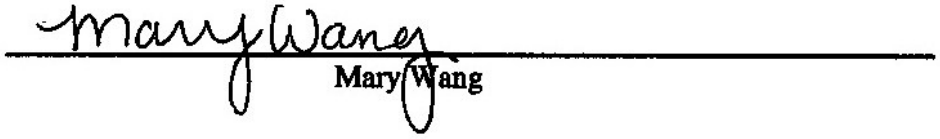
On my honor, I have neither given nor received unauthorized aide on this thesis.



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This thesis project, written by Mary Wang, meets the required guidelines for partial completion of the degree of Bachelor of Arts in Asian Studies

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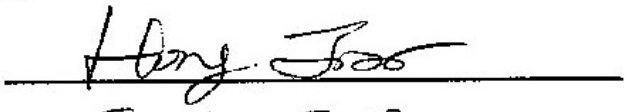
Signed: 

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Internet Addiction Disorder: A Case Study of China

The Internet is so big, powerful, and pointless that for some it is a complete substitute for life.
- Andrew Brown

The quote above exemplifies the power of the Internet to facilitate the dissemination of information and the concern this vastness produces. A quick Google search will bring up dozens of sites that have quoted this, however, the original source is lost. In the world of the Internet, information travels at the speed of a current through a wire or, essentially, at the speed of light. Interpretation and reinterpretation of information occurs rapidly and often times the original meanings and sources get lost. This quotation illustrates a central concern about consuming effects of the Internet to act as an alternate reality – paralleling the discussion of a possible new disorder, Internet Addiction Disorder (IAD).

The introduction of the Internet in the 1970s and its subsequent diffusion into households of average citizens signaled a radical change in the everyday lives of people in developed countries. The Internet is the most recent form of new media, but its impact is not unique. The invention of the printing press in the 15th century sped up the process of booking making and thus allowed for the widespread dispersal of literature. As a result, the greater accessibility to literature spurred an increase in literacy among the European population, wealthy and poor. With increasing literacy rates among the middle and lower class in Europe, this meant that for the first time in history, laymen and women were capable of reading literature, interpreting laws, and perhaps more importantly, the Bible, for themselves (Eisenstein, 1980). The interpretation of the Bible was no longer reserved only for clergyman, a threat to Church control. Societal upheavals like this have happened again and again as technology has continued to develop. In more recent history, the arrival of the radio and television spurred changes in society, all of which have engendered concerns about ill effects, such as its ability to disengage individuals from

participation in social settings (Steinkuehler & Williams, 2006). The Internet is the most recent addition to this list.

In 2000, 360 million users were online; as of June 2012 there are over 2.4 billion Internet users – a growth rate of over 500% (Miniwatts marketing group, 2012). The staggering growth rate of the Internet and its rapid integration into daily life has fueled concern for its overuse. The unique contribution of the Internet over previous communication technology is its ability to foster new volumes and forms of interactivity. The telephone brought the ability to communicate with other people directly from almost anywhere in the world. The Internet enhances this capability, not only in the speed of the communication, but the multitude of ways communication can occur. The instant gratification that has come with rapid web searching, emailing, social networking sites, and online games has also come with concern about its overuse and misuse, prompting research on IAD.

This thesis explores the Internet Addiction debate through an analysis of scientific, sociological, anthropological literature, and popular media articles. Through synthesis of present literature, the question of IAD's independence as a stand-alone disorder will be addressed. In addition, its increased prevalence in Asian countries, especially China, will be explored. Although IAD is recognized and debated in the United States and Europe, the sense of urgency and concern in Asia is even more pronounced. China, among other Asian countries, has recognized IAD as a serious public health issue and support its education, research, and treatment (Block, 2008; Cash, Rae, Steel, & Winkler, 2012). As a case study, China provides a unique perspective due to its censorship laws that allow monitoring and restriction of users' usage habits and activities on the Internet; the one child policy; and the developing Internet café culture that acts a new type of public space. China's increasing research on IAD as a new mental

disorder highlights the societal concern with the increasing prevalence of usage of the Internet, which may have cultural, political, and economic influences.

Chapter 1: The Debate over Internet Addiction as a Unique Disorder

With the technological boom in the past two decades, Internet usage has skyrocketed as computers have become more accessible. In a 2003 U.S. census survey, 60% of American households reported having at least one personal computer (PC), and nearly 55% of households were connected to the Internet (Shaw & Black, 2008; US census, 2003). The 2010 census survey showed that 75% of households have at least one computer, a 15% increase from 2003 (US census, 2010). The advent of computers and the Internet has made information retrieval and dissemination easier than ever. On average, it takes four days for a letter to travel from California to New York; it is nearly instantaneous for an email to travel from sender to receiver. This accessibility, however, has also paved the way for concern regarding its overuse and abuse. The instant gratification that Internet usage provides can have rewarding effects similar to the high of drugs or from gambling. Like a drug, the Internet has been described as having addictive properties, prompting the suggestion that "Internet addiction disorder" (IAD) may be a new mental disorder[1].

As of 2009, IAD is not recognized as a disorder in the *Diagnostic and Statistical Manual of Mental Disorders (*DSM-IV), the reference that provides standard criteria for the classification of mental disorders in the United States and around the world. However, it is being considered for inclusion in the 2013 edition (Block, 2008; DSM-5 proposed revisions).

This chapter attempts to provide a framework for the discussion of Internet Addiction by analyzing the many methods in which this topic has been studied. Through the discussion of previous definitions of IAD and examination of past research, the objective is to form an

[1] Internet overuse, problematic computer use, pathological computer use and other terms are also used to describe this phenomenon in an attempt to avoid using the term addiction. However, for the purposes of this thesis, it will be referred to as "Internet Addiction Disorder" or IAD.

operational definition of Internet Addiction that will act as a framework for the analysis of IAD throughout this thesis.

Defining Addiction: What is Internet Addiction?

The term "addiction" describes a variety of habitual and repetitive actions or behaviors linked to a attaining a certain substance or doing a particular behavior. This term is popularly used for any habitual, compulsive behavior. The colloquial use of "addiction" must be differentiated from the medical terminology[2]. The traditional definition of addiction has focused on dependence or abuse of a physical substance such as a drug. However, there has been increasing acknowledgement of behavioral addictions that do not involve ingestion of a drug. For example, activities such as gambling, sex, and exercise in excess have been described as being potentially addictive. The ambiguity of this term stems from the difficulty in defining "excessive," especially in the context of behavioral addictions. A habit must be differentiated from an addiction, but how habitual does a behavior have to be before it becomes problematic?

A variety of definitions exist that attempt to create an overarching explanation of addiction. The American Society of Addiction Medicine defines addiction as:

> …a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors (American Society of Addiction Medicine, 2011).

Addiction is described as a dysfunction of the neuronal circuitry in the brain, which in turn, manifests as symptoms that can be physical or mental. It is also broadly encompassing, in recognizing a possibility for not only substances, but also behaviors to be addictive. In the case of drug addictions, repetitive and consistent intake of drugs manifests itself in other physical and

[2] The DSM-IV does not recognize "addiction" as a valid diagnosis; instead it favors the terms "abuse" and "dependence" to describe disorders, which could be considered addictions (ex. Drug abuse/dependence is favored over drug addiction). There is debate over these terms as well.

psychological symptoms, such as withdrawal, tolerance, and/or inability to be productive in daily life. It is likely that behavioral addictions exhibit similar symptoms, however the symptomology is harder to distinguish.

Six features are considered to be characteristic of addictions in general: salience, mood modification, tolerance, withdrawal, conflict, and relapse (Griffiths, 1999). Salience refers to the activity's importance in one's life. If it is addictive, the behavior becomes the dominant factor in thinking, feeling, and behavior. In this case, the majority of one's behavior and actions are influenced or motivated by the activity. For example, for drug addicts, this motivation may be the next time a high can be attained; whereas the motivation for Internet addicts is the next time they will have Internet access. Mood modification refers to the emotional consequences of engaging in the addictive activity. This is the "high" or elevation in mood or feelings of calm that accompany taking a drug or surfing the Internet. Tolerance occurs when increased amounts are necessary to achieve the same effects. For drug users, this may be taking increasing dosages of drug, whereas Internet addicts may spend increasingly more time on the Internet. Griffiths (1999) defines withdrawal as the unpleasant feelings or physical effects that may occur when the particular activity is reduced or stopped. Conflict refers to the negative consequences brought upon by continuous fixation on the addictive activity. This includes, but is not limited to, interference in academic, social, personal, and occupational duties, as well as mental and/or physical effects. Relapse is the return to addictive patterns of behavior after a prolonged period of abstinence or control. Reversions back to extreme patterns can be easy and quick even after many years.

Although there is little standardization for the definition of Internet Addiction, it does follow many of the characteristics of addiction described previously. There is general agreement

that IAD involves problematic computer use that is time consuming, and interferes with one's commitments and responsibilities in daily life (Block, 2008; Shapira, Goldsmith, Keck, Khosla, & McElroy, 2000). The six characteristics described above can be further condensed into four broad categories: excessive use, tolerance, withdrawal, and negative consequences affecting other aspects of life. For the purposes of this discussion, this phenomenon will be referred to as "Internet Addiction Disorder" (IAD) and be operationally defined as a behavioral addiction that involves overuse of the Internet and its related applications, causing impairment of one's psychological, mental and emotional state, as well as interference in academic, occupational, personal and social interactions. This will be used as a guideline, but may not encompass all aspects of this phenomenon.

Methods of Testing and Diagnosis:

Parallel to the lack of a standardized definition of Internet Addiction Disorder, there is a lack of standardization in the testing and diagnosis of IAD. Griffiths (1999) suggests that the way to determine the addictiveness of non-chemical addictions is to "compare them against clinical criteria for established drug-ingesting addictions." Several methods have been developed to diagnose IAD based on this directive. The criteria for IAD diagnosis are generally based on the criteria for diagnosing pathological gambling, a compulsive-impulsive disorder, or in the framework of substance abuse/dependence criteria as outlined in the *DSM* (Byun et al., 2009).

Pathological gambling and substance abuse are attractive bases for IAD criteria because they share similar characteristic symptoms. For example, both gambling addicts and excessive Internet users exhibit poor impulse control, which can lead to severe personal and social consequences such as job loss. Substance abuse, IAD, and pathological gambling all involve a repetitive habit that is perceived as rewarding, the lack of which may produce symptoms such as

withdrawal. Internet usage, like gambling, functions on a variable ratio reinforcement schedule[3], enhancing it's rewarding effects. Applications such as social networking sites, video games, and instant messaging operate on a unpredictable and variable reward structure (Cash et al., 2012). The experience of reward is intensified when combined with mood-enhancing content. For example, video games already provide a sense of reward and accomplishment by defeating enemies or accomplishing missions. The Internet provides the ability for socialization and cooperation amongst players that is, in turn, socially stimulating and rewarding.

Adapting DSM-IV criteria for pathological gambling to IAD, Young's 8-question Internet Addiction Diagnostic Questionnaire (YDQ) is one of the most widely used diagnostic tools (Young, 1998). The questionnaire included questions that alluded to excessive use, withdrawal feelings, tolerance, and negative consequences from Internet use (Figure 1). Participants who answered yes to five or more criteria were classified as being "Internet dependent." The cut-off of five or more is consistent with the criteria for the diagnosis of pathological gambling. This diagnostic questionnaire has also been adapted and translated for use in other countries, such as China. The short and simple form of this

1. Do you feel preoccupied with the Internet (think about previous on-line activity or anticipate next on-line session)?
2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
5. Do you stay on-line longer than originally intended?
6. Have you jeopardized or risked the loss of a significant relationship, job, educational, or career opportunity because of the Internet?
7. Have you lied to family members, a therapist, or others to conceal the extent of involvement with the Internet?
8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?

Figure 1. Young's Diagnostic Questionnaire

[3] Reinforcement or reward for an activity is random, and often unpredictable. The unpredictability makes the reward more satisfying.

questionnaire makes for a quick diagnosis. However, the brevity of this questionnaire may not be representative of the entire spectrum of IAD, which threatens the sensitivity of the questionnaire.

Brenner (1997) developed the Internet-Related Addictive Behavior Inventory (IRABI) based on the DSM criteria for substance abuse and addiction. It includes 32-true-or-false questions that assess experiences similar to those associated with substance abuse, the questions range from time spent on the Internet to social isolation due to Internet use. Morahan-Martin and Schumacher (2000) have also adapted the DSM criteria to develop the Pathological Internet Use (PIU) scale. It consists of 13 yes/no questions that assess Internet usage and its effect on academic, work, or interpersonal relations. These questionnaires operate on a cut-off score that divides addicts from non-addicts. However, if IAD is similar to other impulsive-compulsive disorders like OCD, there is a spectrum of severity that should be accounted for by diagnostic tests.

To gain a more comprehensive and conservative judgment, some studies have utilized multiple methods of diagnosis. For example, Chou and Hsiao (2000) utilized both the IRABI and the YDQ, defining participants as Internet addicts only if both criteria were met. They found that they diagnosed 50% fewer people with IAD than using either method alone. This provides a stricter and better measure for diagnosis. In addition, others have developed new measures that do not rely heavily on the DSM-IV criteria (Sharpira et al., 2000; Widyanto & McMurran, 2004). Another approach attempts to define Internet addiction based on a single question, such as the amount of time spent online. Length of time is generally a good predictor of addictiveness, but is limiting in that it does not take into account other factors such as the applications being used, which provide context for the addiction (Byun et al., 2009). The variety of methods highlighted

here exemplifies the lack of consensus and standardization when it comes to the identification and diagnosis of IAD.

Support for Internet Addiction Disorder:

It is estimated that between 1% and 14% of Internet users, worldwide, exhibit some sort of Internet dependency that can be as destructive as alcoholism or drug addiction (Block, 2008; Park, Kim, & Cho, 2008; Tao, Huan, Wang, Zhang, Zhang, & Li, 2009). Proponents of IAD as a unique and independent disorder argue that Internet addiction is a compulsive-impulsive spectrum disorder that can be divided into three subgroups: excessive gaming, sexual preoccupations, and email/text messaging (Block, 2008). Additionally, social media (Facebook, Twitter, etc.) use is considered an additional category. Each category shares four components thought to be indicative of an addiction: excessive use, withdrawal, tolerance, and negative repercussions (Block, 1998; Sharpira et al., 2000). Although usage differs between countries, globally, IAD has been recognized as a potential problem worldwide, with a stronger prevalence in Asian countries (Block, 1998). South Korea considers IAD to be one of its most serious public health issues (Ahn, 2007). China publically discourages gaming use of more than 3 hours per day (People's Daily online, 2007). In the United States, the prevalence of IAD is less clear because usage is contained to private homes and reports are unlikely due to shame, denial or minimization of the problem. However, recent media coverage has acknowledged a growing concern about IAD in the United States (NBC news, 2012). In addition, in 2009, the first rehab center for IAD opened in the United States with promising treatment results (Cash et al., 2012). Despite the cultural differences, case studies done throughout the world suggest that IAD is similar globally.

Currently, neuroimaging studies lend the most support for IAD as a unique disorder. Voxel-based morphometry (VBM) imaging suggests that the neural signature of addiction is similar between Internet addicts and substance abusers (Ko et al., 2008; Small, Moody, Siddarth, & Bookheimer, 2008; Yuan[2], Qin, Liu, & Tian et al., 2011; Zhou et al., 2011). Voxel-based morphometry is an imaging technique that maps relative volumes of gray matter, the neuron cell bodies of the brain, across tissues of the brain. By controlling for differences in brain volume between individuals, gray matter volume can be compared across subjects. These studies indicate that long-term Internet addiction may result in structural alterations of the brain in a broad range of brain areas, such as prefrontal cortex areas, the cingulate cortex, insula, and surrounding white matter areas (Zhou et al., 2011; Yuan[1] et al., 2011; Yuan[2] et al., 2011).

The prefrontal cortex (PFC) is the anterior part of the brain's frontal lobe. This area has been implicated in planning, decision-making, personality, and moderating social behaviors. In particular, the orbitofrontal cortex (OFC) and dorsolateral prefrontal cortex (DLPFC) sub regions of the PFC are important in the discussion of IAD. The OFC is involved in decision-making processes, especially integrating the emotional and motivational aspects of decision-making, whereas the DLPFC is associated with aspects of cognitive control and motor planning. Dysfunctions of these areas could result in a person's inability to monitor and inhibit inappropriate behaviors.

Decreases in gray matter volume, and in the number of neuronal cell bodies, in the DLPFC and OFC have been observed in Internet addicts compared to normal controls (Yuan[1] et al., 2011). The atrophy of cell bodies in this area has also been correlated with the duration of IAD: the longer IAD persisted, the more atrophy was observed (Yuan[1] et al., 2011).

Degradation of cells in these areas may have important implications in cognitive control mechanisms that lead to addiction. Cognitive control is the ability to focus on a given stimuli and filter out responses to irrelevant stimuli. The OFC has extensive connections with the emotional limbic system[4] of the brain and is thought to contribute to goal-directed behavior by assessing the motivational significance of stimuli. In the rat homologue of the OFC, damage causes impairment in the modification of behavior according to changing environmental cues (Balleine & Dickinson, 1998; Rolls, 2000). As a result, atrophy in this area may contribute to the motivational or reward characteristics of IAD and enhance its addictiveness.

Similarly, the damage to the DLPFC also causes a decrease in cognitive control. A decrease in gray matter in this area indicates that a person with IAD may have a harder time monitoring and adjusting behaviors to fit social norms. Perseverative behavior is increased. This may account for the ability of IAD patients to spend hours on the computer without even realizing it.

Decreased gray matter volume has also been seen in the left anterior cingulate cortex, and left posterior cingulate cortex (Yuan[1] et al., 2011). These cingulate cortical areas are responsible for different modulatory aspects of emotional behavior and response. Both are highly linked to the PFC cortex structures and play roles in emotion and memory. The loss of neurons in these areas may explain some of the disinhibition symptoms of IAD, one of the fundamental problems of Internet addicts.

In addition, the insula has recently been highlighted as having a role in addiction. Studies have suggested that insula activity is correlated with subject's ratings of urge (Naqvi & Antoine, 2008). Results suggested that the insula translated the interoceptive state into conscious feeling linking to decision-making processes. Decreased gray matter in this area may be responsible for

[4] The limbic system is an important system in the regulation of emotion and emotional influences on behavior.

decreased ability to suppress cravings. In particular, this has been shown to play a role in cigarette smoking and nicotine withdrawal (Franklin, 2007; Mcbride et al., 2006; Wang et al., 2007). Insular activity may play a critical role in the explicit motivation to take drugs. In Internet Addicts, insular gray matter volume was decreased compared to normal controls suggesting a role of the insula in addiction (Zhou et al., 2011).

A decrease in gray matter volume in the limbic system areas and the insula suggests that areas important in the modulation of emotional behavioral responses are highly affected in IAD. This may account for the various emotional and behavioral problems that underlie IAD patients. In addition, the prefrontal areas discussed are also linked to emotional regulation, especially in relation to decision making. Evidence suggests that structural changes in the OFC, DLPFC, and ACC are likely to affect IAD symptomology and explain some of the fundamental symptoms of IAD.

Another form of neuroimaging, functional magnetic resonance imaging (fMRI), suggests that both substance dependence and online gaming addicts exhibit similar areas of activation in response to cue-induced cravings. Ko et al. (2009) presented participants with gaming pictures (to induce craving) and mosaic pictures (neutral images) while undergoing fMRI scan. After the scan, individuals were asked to rate their level of desire to play the online video game. Brain activity was correlated with self-reported ratings of gaming urge and gaming experience.

This study revealed that there was activation in the right orbitofrontal cortex, bilateral anterior cingulate, right DLPFC, right nucleus accumbens, and right caudate nucleus in those suffering from IAD (specific to video games). Little or no activation was found in these areas for the mosaic neutral images or in the control group viewing these images. This lends further evidence for the roles of the OFC, ACC, and DLPFC in addiction as discussed previously. Of

note is the activation of the right hemisphere of many of these areas. Broadly speaking, the right hemisphere is more lateralized for emotional, visual and spatial activities, while the left hemisphere is associated with more concrete functions such as language. The right OFC assesses the motivational significance of stimuli and modulates the selection of behavior to acquire a desired outcome. It also creates and maintains expectations about possible rewards associated with certain behaviors. The right DLPFC is likely to have important interactions with the right orbital frontal cortex, as it integrates the present experience with memory of past experiences to generate goal directed behavior. Thus, the DLPFC and the orbital frontal cortex are likely activated together in the viewing of game-related images to indicate experience or memory of the game.

The nucleus accumbens (NA) is an important site for reward activity. In drug addicts, the NA is activated in response to the taking of a drug and activation of this area represents the prediction of a reward. Activation of this area after viewing game-related images may be an indication of the emotional reward tied to this game and is likely to enhance the motivation for game-seeking behavior. It is important to note that this study only used male participants who played video games and thus cannot be generalized to the entire population of Internet users, but suggests that features of other addictions, such as craving and urge, are inherent in both behavioral and substance addictions (Ko et al., 2009).

Opposition against Internet Addiction Disorder:

Opponents of Internet Addiction Disorder argue that the Internet as an entity may not be inherently addictive. The Internet itself only speeds up the retrieval and dissemination of information, which for the most part, is not considered addictive (Wolfe, 2011). In fact, humans have been retrieving and distributing information for millions of years. The Internet is the most

recent entity to streamline the information retrieval process. E-books and e-mail act as alternatives to libraries and post offices, making it possible to send and receive information via a computer. The Internet as a whole is neural. The addicting aspects of it come from the applications that the Internet provides, such as video gaming, online shopping, gambling, and the variety of social applications available.

Comorbidity of IAD with a variety of other psychiatric disorders, such as depression, bipolar disorder, sexual compulsivity, and anxiety suggest that Internet abuse is actually a symptom of another pathology rather than an independent disorder. However, established disorders such as pathological gambling and eating disorders can also be symptomatic of other disorders making the causality of IAD difficult to determine.

Shapira, Goldsmith, Keck, Khosla, and McElroy (2000) conducted a study on the psychiatric features of individuals diagnosed with IAD. Using an interview method, 20 participants were evaluated using the Structured Clinical Interview for DSM-IV-Patient Version to assess Axis I[5] psychiatric comorbidity. Every participant met DSM-IV criteria for an impulsive compulsive disorder (not otherwise specified). All participants also met the criteria for at least one lifetime DSM-IV Axis I diagnosis. The most common were mood and anxiety disorders, most commonly bipolar disorder and phobias, respectively. This study suggests that there is a comorbidity of IAD with DSM-IV Axis I disorders. However, the small study size and the self-reported nature of the interviews and self-referral of the participants limits the conclusions that can be drawn from this study. The addition of a control group would contribute to stronger comparisons. In addition, many of the patients were aware of their possibly pre-existing conditions, especially the bipolar patients.

[5] Axis I disorders are such as depression and anxiety that present without psychotic episodes; they are usually the most recognized disorders and fairly acute in nature.

The high comorbidity of IAD with other psychiatric disorders suggests that IAD is not a distinct disorder and may be a symptom of an already characterized psychiatric illness. However, the precise role of causality is still unknown because these psychiatric disorders could also be symptomatic of IAD.

Although neuroimaging studies provide evidence of physical changes between IAD and non-IAD individuals, the role of causality is also debated. For example, prefrontal cortex damage is associated with a large variety of deficits in executive functioning. In particular, atrophy of the PFC will predispose people to addiction of any kind, thus IAD may be the manifestation of the damage rather than the cause of the damage.

The very broad definition of "addiction" leaves open the possibility that any over compensatory behavior could be considered an addiction. The likening of IAD to other impulse control disorders, such as pathological gambling or to substance abuse, may also be problematic. Although it shares similar characteristics such as preoccupation, mood modification, tolerance, withdrawal, and functional impairment (Cao & Su, 2006; Hall & Parsons, 2001; Leung, 2004), pathological gambling may not be an appropriate reference from which to model IAD. For example, gambling is a very anti-social, independent activity, whereas the attraction of the Internet is very much based on social interaction. Gambling has no socially redeeming value. Internet addicts also do not necessarily suffer from the same relationship, financial, and social troubles that plague gambling addicts. The severity and damaging effects of a preoccupation with the Internet may not be as detrimental as substance abusers as well.

Limitations of Research:

The variety of methods and questionnaires developed for IAD diagnosis is advantageous in that they are, for the most part, concrete and simple. However, the variety may be problematic.

Each questionnaire is based on a different framework of analysis (ex. Pathological gambling or substance abuse) and thus targets different characteristics. The lack of consistency and consensus in testing method makes valid comparisons across studies very difficult. In addition, cut off scores do not reflect the continuum of severity that differs among individuals with IAD, just as with compulsive-impulsive disorders. The development of a standardized set of criteria for diagnosis is necessary and would provide consistency in diagnosis and stronger evidence for IAD's existence.

Another limitation is the lack of consistency in definition and terminology. The numerous names for "problematic computer/Internet use" are indicative of the lack of consensus and consistency of definition and terminology (Shaw et al., 2008). They reflect a tension between the view of this disorder as pathological or abnormal and a focus on excessive usage. More specifically, this phenomenon has been analyzed as an addictive disorder, similar to drug or substance abuse, while others have considered it as a impulse-control disorder, similar to obsessive compulsive disorder (OCD). Formation of an operational definition for this phenomenon would greatly facilitate standardization of this disorder.

Conclusions:

Although there is still debate over the classification of Internet Addiction as a mental disorder, for the purposes of this discussion, IAD will be discussed as an emerging mental disorder. There is no denying that as technology becomes a more and more integral part of daily life, the consequences that come with it will also become more apparent. Although the Internet itself may not be an addictive entity, its applications (such as video games, social media, gambling, etc.) do have addictive properties. Applications such as online gambling, online sexual behavior, and video gaming are new variants on pre-existing issues, for which the Internet has

provided a new method to apply these behaviors. However, other activities such as chat rooms and instant messaging are novel to the Internet and may be a new form of communication that could be possibly problematic. Perhaps it is not so much that the Internet is addictive, but that it is a facilitator of addictive activities that may be pre-existing or novel to the Internet's introduction. Internet addiction will be assessed as a possible problem that has social and personal implications. In the following chapter, the issue of Internet Addiction and its study in China will be discusses.

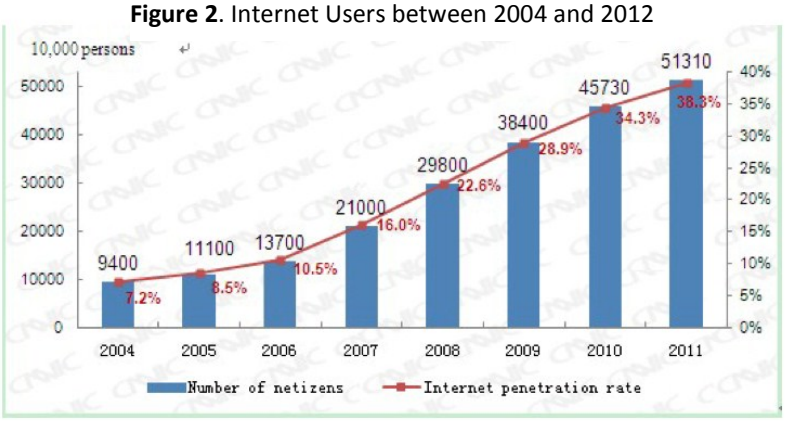
Chapter 2: China as a Case Study for IAD

The first successful email sent out on September 14th, 1987 from China read "Across the Great Wall, we can reach every corner of the world" (越過長城，走向世界). Since its first connection in 1987, the Internet has emerged as a new cultural phenomenon in Mainland China. It has become a symbol of China's development and modernization, but also a cause for concern. In recent years, American mainstream media began covering tragic incidences of "Internet suicides" in Asian countries. For example, a 2006 story reported the death of a 14-year old boy who jumped off a tall building in China to "join the heroes of the game he worshiped" after a 36-hour gaming session (Xinhua News, 2006). This and similar stories have prompted discussion of Internet Addiction as a public and social problem in China. In addition, the advent of Internet rehabilitation centers and the media reports around their functions also signal the increasing concern of IAD. The Chinese worry of Internet Addiction or *wangluo chengyin* (网络成瘾) is reminiscent of the global debate on IAD's existence discussed in the previous chapter. As the Internet has become a growing phenomenon worldwide, China has become a leader in the research of IAD as a mental disorder. This chapter explores China's relationships with the Internet, its usage statistics, and research.

Internet Usage in China: Who is using what?

As of January 2012, the China Internet Network Information Center reports that there are 513 million Internet users in China, an increase of 55.8 million from the previous year

Figure 2. Internet Users between 2004 and 2012



(See Figure 3; CNNIC Report, 2012). Although China has the highest number of Internet users in the world, only 38% of the total population is accounted for; compare this to the United States, which has an Internet penetration of 78% among its population (CIA Factbook, 2009). From this perspective, why is the usage rate in China so low?

The "Digital Divide" is a term used to explain differential Internet adoption rates across diverse social segments of society (Zhu & Wang, 2005). In China, the disparity is most noticeable along age and educational dimensions (Zhu et al., 2005). At the end of 2003, 49% of college educated individuals reported using the Internet compared to only 6% of individuals without college educations. Across age dimensions, Internet usage is highest among the younger generation (18-34 years old; 23%) compared to 9% of middle aged (35-49 year olds) and 3% of senior citizens (50+; Zhu et al., 2005). In addition, the majority of Internet users are concentrated in China's 10 most developed provinces along the eastern coast (Zhu et al., 2005).

These statistics reflect a general trend in Internet usage among different generations worldwide. Much of the differing usage patterns are due to exposure. The younger generations are more likely to have positive attitudes toward the Internet because they grew up using it, while the older generations may be more hesitant to adopt new technology. Similarly, the coastal areas of China are more developed and wealthier than inland areas, in general. Rural areas may not have access to the infrastructure, such as routers or broadband connections, which are necessary to access the Internet.

Forms of access and how Internet is accessed differs in China as well. Whereas the majority of Americans have personal computers and private Internet access in their home (US Census Survey, 2010), in-home access is a much more recent phenomenon in China. Currently, about two-thirds of the Chinese population accesses the Internet at home, while the rest have

access only at their workplaces, schools or Internet cafes (Zhu et al., 2005). It is also interesting to note that over 60% of China's Internet users connect to the Internet via their mobile phones, second only to desktop Internet use (73%; CNNIC Report, 2012).

Internet cafes (or *wang ba 网吧,* literally "net bars") are also popular in China and around Asia serving as public gathering places where people can access the Internet, and play online games together, among other Internet related activities (Golub & Lingley, 2007).

The majority of Chinese Internet users access almost exclusively Chinese websites. Although it makes sense to favor websites in one's native language, it may also be a manifestation of China's unique censorship over the Internet, in that accessibility to outside sources is restricted. It is estimated that fewer than 6% of China's websites link to other websites outside of the country (Zhu, Meng, Xie, Li, Li, 2008). China's Internet use is similar to that of other countries. The most popular online activity in China is email, followed by search engines, reading online news, browsing web pages, and instant messaging. These data reflect Internet usage as mainly an interpersonal communication medium (email, peer-to-peer communication) and information-seeking medium (search engines, web browsing; Zhu et al., 2005). However, this type of usage is rather benign and often considered productive means of Internet use[6]. This is reflective of the majority of the population that would not be considered Internet addicts. Online entertainment (games, music, movies) has become increasingly popular among the younger generation and is central to the addictive properties of the Internet. In particular, the interactivity and increasing popularity of multiplayer online games is becoming a problem in not only China, but globally (Steinkuehler et al., 2006).

[6] Productive usage is defined as usage of online applications for academic or work related contexts, as opposed to purely leisure or entertainment purposes, such as video games.

Although video games are not a novel phenomenon of the Internet, it has opened up the ability of video games as a social, rather than individual endeavor. The enhanced interactivity and possibilities for socialization and human cooperation is integral in its perception as a social entertainment medium.

What's the prevalence of IAD in China?

China is considered to be at the epicenter of Internet Addiction and a leader in its research. The estimates of the prevalence of IAD in China are highly variable and dependent on the diagnostic methodology and the population surveyed (Cao & Su, 2007; Ni, Yan, Chen, & Liu, 2009; Zhang, Amos, & McDowell, 2008).

The younger generations comprise the largest population from which statistics are gathered. A survey of 2620 high school students in Changsha City, China using Young's Diagnostic Questionnaire found that 2.4% of the students surveyed were considered "Internet addicts" (Cao et al., 2007). Their average weekly Internet use was 11.1 ± 8.6 hours for the Internet addicted group compared to 3.1 ± 4.9 hours for the control group. Gender differences were also found, with a higher rate of male addicts than female addicts, consistent with previous research (Zhang et al., 2008). Similarly, a 2009 study of freshman university students in China found that 6.44% of the 3557 first-year students qualified as addicts, using an extended 20-item version of Young's Internet Addiction Test (IAT; Ni et al., 2009).

A cross national study found that compared to youth in the United States, Chinese youth seemed to be more likely to be Internet addicted (Zhang et al., 2008). Using a 28-item IAD Likert scale questionnaire based on Wang's (2001) criteria, in which 10 Internet addiction symptoms were measured in a sample of 317 students (171 American/143 Chinese students), 14% of the Chinese students were classified as "heavily addicted" compared to 4% of U.S.

students. In addition, hours spent online and frequency of Internet use was positively related to Internet Addiction in Chinese students, but not in American students.

Results from this study suggest that IAD is prevalent in both developed and industrializing countries. This suggests that Chinese students seem to spend more time online and by extension are more predisposed to IAD than American students, however it should be noted that the sample size was fairly small. Results were also collected from a single institution in both countries and are likely not representative of the entire population of either country. These are issues that must be considered when looking at any study.

General findings suggest that addiction rates are highly variable and tend to be dependent on demographic variables such as age (younger vs. older) and gender (male have a higher prevalence of IAD than females). It is also highly dependent on the diagnostic techniques used and population that the samples are derived from. This variability, once again, highlights a need for standardization.

What's being studied?

Psychological features that could influence the acquisition of IAD are also being widely studied in China. Cao et al. (2007) explored the psychological features of IAD. The Internet addicted group exhibited increased emotional and behavioral problems, which correlated with increased scores on the Strengths and Difficulties Questionnaire (SDQ). The 25-item SDQ measures strengths and difficulties across five dimensions: hyperactivity-inattention, emotional symptoms, conduct problems, peer problems, and prosocial behavior. The IAD group scored higher on all of the dimensions except for the prosocial condition and the peer problems difference was not significant. The IAD group exhibited more psychiatric problems than the control group, indicating that IAD is associated with a variety of behavioral and emotional

problems. However, the causality of these problems remains unclear. For example, hyperactivity and attention deficits have been found to be a risk factor in Internet addiction (Yoo et al., 2004). Problems with attention and concentration may lead to negative criticism from parents and teachers; the Internet may provide a method in which these students are able to vent and feel a sense of satisfaction and approval that they are not receiving from their teachers or parents. Similarly, students with hyperactivity-inattention problems may also be more impulsive than those who do not have these problems; this may explain their predisposition to become "addicted" to the Internet once they begin using it.

Similarly, anxiety and depression have shown to be highly correlated with patients who are diagnosed as Internet addicts. Ni et al. (2009) correlated self-reported ratings of depression and anxiety using Zung's depression and anxiety scale with Internet addiction ratings (Zung, Richards, & Short, 1965). The Internet addicted group had significantly higher scores on both self-ratings of depression and anxiety. These self-rating scores were also significantly positively correlated with level of Internet addiction. This is consistent with previous research on the association of IAD with depression and anxiety in college students (Ko et al., 2008). These results confirm that there is a comorbidity of IAD with other psychological disorders, but causality cannot be determined in this particular study.

Internet addiction is also associated with poor time management and sense of time efficacy. Cao and Su (2007) found that their Internet addicted group performed more poorly on the Time management disposition scale (TMDS), reflecting an individual's overall time management abilities, than controls. These results may account for poor planning of day-to-day activities, in general (Cao et al., 2007). On the other hand, weak time management ability may

result in increased stress, anxiety, and emotionality due to poor allocation of time (Huang & Zhang, 2001)

Because of the public health concern in China, treatment and diagnosis has been emphasized more readily than in other countries. The presence and development of Internet Addiction rehabilitation centers has been widely accepted in China, although they exist in other countries as well. Some of the most popular diagnostic techniques used in China are adapted versions of Young's diagnostic questionnaires based on pathological gambling and the Chinese Internet Addiction Scales (CIAS). Clinicians have also attempted to standardize Internet Addiction diagnosis in China (Tao et al., 2009). In 2008, China developed its own diagnostic criteria for IAD that is currently used in treatment settings (Liu, Wang, & Zhuang, 2008). The criteria define IAD as 1) more than 6 hours of use per day; 2) heavy use for longer than 3 months; 3) social, study, and communication skill dysfunctions; 4) dependence symptoms; 5) withdrawal (Liu, Liao, & Smith, 2012). However, these criteria seem nonspecific for IAD and reflect general characteristics of all addictions.

With the increasing interest in IAD studies, there is a need for evaluation of their methodological quality. Liu et al. (2012) evaluated 24 IAD studies for methodological quality and treatment outcomes, based on 15 attributes[7] using three raters. They found that only two of the attributes were readily reported on by more than 50% of the studies, while less than 50% of the studies were strong in the remaining 13 attributes. This suggests that most studies did not have established reporting guidelines for clinical trials. Analysis of treatment effectiveness is hindered due to the low methodological strength. The low methodological quality of these

[7] The attributes were objective, sample size, power, outcome, random sequence generation, allocation concealment, active comparison, baseline data, manualized treatment, treatment adherence rating, collateral report, collection of an objective measure besides self-report, intention-to-treat (ITT), blind assessment, and 30-day follow up.

studies reflects the continued need for standardization of IAD diagnosis in order to provide more power to these studies.

Conclusion:

Although the issue of IAD has received increased global attention, China has recognized it as a potential hazard to the well being of its population. The large amount of research and discussion occurring within China about this issue provides evidence that this is a phenomenon with serious health-related implications in the minds of the Chinese. While the first two chapters have looked at the prevalence and intensity of IAD both globally and in China in particular, the next chapter will examine the influences and societal implications of IAD.

Chapter 3: Societal Influences and Social Implications of Internet Addiction in China

The previous two chapters have approached the phenomenon of Internet Addiction Disorder (IAD) through psychological and biomedical lenses. This chapter attempts to conceptualize the issues of IAD as a function of social, political, and economic phenomena that may contribute to the perceived problem of IAD in China. China provides a unique perspective on the Internet Addiction debate because of its ability to control content and access to the Internet for those residing in the country. In addition, it is the only country in the world that has implemented a limit for childbearing: one family, one child. Although not unique to China, the popularity of Internet cafes are a phenomenon of Asian countries that attracts youth of all ages to a social setting that promotes computer use. In addition, cultural differences may mediate attitudes toward the Internet and affect when and how it is used. Although there is little literature on the epidemiology of Internet Addiction disorder, the factors presented above set China apart from other countries and may account for IAD's increased prevalence in Chinese literature.

Cultural Attitudes toward the Internet:

Attitudes toward the Internet may be mediated by social and cultural norms that differ not only between western and eastern countries, but also between individual countries. A 2010 BBC poll that surveyed over 27,000 people around the world found that four in five people believe that the Internet should be a fundamental right as a communication system (Figure 3; BBC News, 2010). It goes on to describe the Internet as integral to a countries infrastructure as roads, waste, or water systems. This suggests that as more and more technology

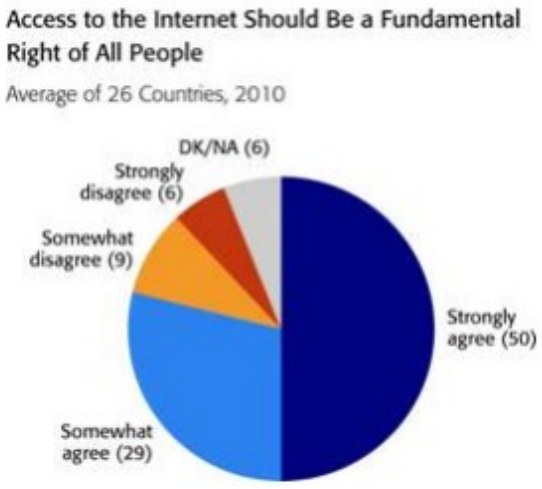


Figure 3. Internet as a Fundamental Right

is being integrated into daily life, the Internet may become an entity necessitating governmental regulation. Countries differ in their attitudes toward Internet regulation. Citizens of China, which already possesses censorship laws on the Internet, believed that some regulation of the Internet is necessary. Other countries agreed; around 55% of UK citizens were not against governmental regulation of the Internet. However, other countries like South Korea and Nigeria believed that the Internet should never be regulated. From this survey, it seems that support for the Internet is overwhelmingly positive and its availability and usage seems to be becoming a necessity.

Internet Censorship in China:

Internet censorship in China rides a fine line between opening up as a country to the international community and restricting information and dissent from China's population. It is a tool that signals China's coming of age into the modernized world, but also a threat toward its strict control of information. China has achieved this through the implementation of a sophisticated chain of firewalls with internal content monitors, ironically termed "the Great Firewall" (Hu, 2011).

The government states that content that is "superstitious, pornographic, violent, gambling-related, or otherwise harmful" is censored (China White Paper, 2010). However, many politically centered websites on issues such as Falun gong, democracy, the Tiananmen Square protests, freedom of speech, and other potentially threatening terms are censored (Washington post, 2006). In addition, foreign media websites are also blocked on occasion, such as during the recent Communist party presidential transition. Apart from firewalls, blockage has occurred through the filtering of certain terms by search engines, both international (Yahoo, Google) and domestic (Baidu) (New York Times, 2006).

The Chinese government justifies censorship as a right of the government to govern the Internet according to its own rules inside its borders (China White paper, 2010). It proclaims that the Internet is a "crystallization of human wisdom," but that its citizens cannot and should not get access to all of this wisdom in order to curb the harmful effects of illegal information or misinformation about state security, public interests, and children (presumably pornography; China White Paper, 2010). It remains confident that its citizens are fully able to enjoy their freedom of speech via the Internet. However, according to Amnesty International (2009), China's journalists and Internet users are at high risk of imprisonment if they address any politically sensitive topics. Approximately 30 journalists and 50 other individuals have been imprisoned for posting their views on the Internet (Amnesty International Report, 2009). The threat of being watched also creates an effect of "self-regulation" where the perception of being monitored causes users to censor themselves in order to avoid negative repercussions.

Implications for the IAD debate:

Internet censorship gives China a unique ability to regulate the usage habits of its citizens. Although its main purpose is to censor websites and discussions that may be problematic or threatening to the national unity of the Communist party, it also leaves open the opportunity to regulate use in even more ways, such as how much time people spend on the Internet or how long they can be on certain websites. Especially in cases of video games, many Asian countries have tried to restrict the playtime of youth. The effectiveness of this regulation and restriction is still unknown, however.

One Child Policy:

In 1980, Deng Xiaoping introduced the "One-Child policy" as an open letter to members of the Communist Party and the Communist Youth League (Hvistendahl, 2010). This population

control policy stated that one couple may only have one child, with few exceptions[8], in order to relieve the demographic tension fueled by the runaway birthrate and exponentially growing population of the time (Pascu, 2011). Families were encouraged to have one child with the prospect of financial and material incentives; strict rules dissuaded parents from having more than one child (Nakra, 2012)[9]. Over three decades after its establishment, China has seen a decrease in population growth and an increase in economic expansion and standard of living. However, these successes have not come without negative consequences (Pascu, 2011; Nakra, 2012). Although it was first presented as a temporary solution, there has been no set time for its dissolution to date (Nakra, 2012).

At the inception of this policy, the goal was set at a target population of 1.2 billion by the year 2000; the census that year put the population at 1.27 billion (Nakra, 2012). It is estimated that this policy has helped prevent over 400 million births[10] (Hvistendahl, 2010; Nakra, 2012). Additionally, in the 30 or so years since the beginning of this policy, China's economy has experienced rapid growth and urbanization. Driven by its large labor force and international investment, it has become the second largest economy with a growth rate of 10% per year (Nakra, 2012). In 30 years, China has achieved what took most European countries over a century to accomplish.

With the success of this plan, many consequences should also be noted. Although the plan has been ultimately successful in curbing China's population growth, it has also decreased China's fertility rate from 5.5 children per woman, before 1980, to 1.7[11] in 1992, one of the

[8] The most common exceptions are if the first child is a girl, depending on the local government, parents may have a second child; if the first child is handicapped; if a parent is a minority or was an only child his/herself, etc.
[9] Ex. A second child would not be recognized by the state as being a "legitimate citizen" essentially
[10] This is a claim made by the Chinese government; however, other research suggests that the number is closer to 100 million births avoided over the past three decades. (Hvistendahl, 2010)
[11] Once again, another statistic presented by the Chinese government that may be contested; it is suggested that the rate is probably closer to 1.5 children per woman

lowest fertility rates in the world (Hvistendahl, 2010). This will also have consequences for China's aging society, as the number of elderly individuals begins to severely outnumber the number of active adults in the work force. As in the United States, there will be fewer young people to pay taxes and care for the elderly. The dependency ratio is estimated to be around 3 dependents per 1 active working adult (Nakra, 2012).

In addition, because of the one-child limit, there has been a severe bias toward birthing male children. This has created a large gender imbalance. It is estimated that there are 33.31 million more males than females in China currently or about 120 boys born for every 100 girls (Pascu, 2011). These data may be inaccurate, though, because of the large number of Chinese people (especially girls) who are not necessarily identified as a member of the state because they are not registered and thus are not entitled to lawful employment, education, health care, or social protection (Pascu, 2011).

Although the discussion of whether or not this policy is outdated is beyond the scope of this paper, it is interesting to note that decelerating population growth is a trend that occurs when countries begin to develop and modernize (Pascu, 2011). Thus, it is likely that this policy is becoming obsolete, as attitudes towards family planning change and Chinese families voluntarily decide to have fewer children.

Implications for IAD:

Of particular interest to the discussion of IAD is the idea that the one child policy has propagated the development of a "Little emperor/empress syndrome." In a society in which children grow up with no siblings, it is likely that they receive exaggerated attention from parents and grandparents alike. This increased pampering may have psychological and emotional

repercussions, but also social consequences (Pascu, 2011). Especially important is its implications in social relations as the children mature and age.

This increased attention combined with the increases in standards of living and spending power in Chinese urban families may produce children who are both overly spoiled and highly burdened with the need for success to maintain the family status. This immense pressure and extreme pampering may be problematic to social and emotional growth. Although research on this topic is equivocal, social relations among individuals growing up as an only child versus with siblings may influence the child's openness to others (Hvistendahl, 2008). This lack of peer interaction at home may be a factor in the propagation of IAD, as children turn to the Internet and computer games as an outlet for socialization. This, with the added fact that the most widely abused video games, such as World of Warcraft or Starcraft, are marketed to a male audience, may also explain the increased incidence of IAD diagnoses in males.

However, globally, as countries develop and industrialize, populations tend to increasingly privatize home life. In China, for example, *hu tong* culture fostered a sense of community and neighborhood camaraderie, but with the development of high-rise apartment buildings, the privatization of family life has also occurred. As a result, the courtyard gathering places of *hu tongs* was eliminated. Thus, decreased socialization of children may be a result of the One Child Policy, but it may also be attributed to modernization and it's elimination of traditionally social locals.

Internet Café Culture in China:

An Internet café or cybercafé is a place that provides access to the Internet, usually for a fee, and may also serve drinks and snacks. Unlike the coffee shops that offer free Internet to customers, the attraction of Internet cafes (or *wang bas,* 网吧) in China is not the beverages or

snacks, but rather the availability of computers and Internet access. According to a 2005 survey by the China Ministry of Culture there are more than 110,000 Internet cafes in Mainland China. Approximately 20% of China's Internet users go to Internet cafes as their primary mode of access. More than 70% of visitors go to play video games and 90% of visitors are males (China Ministry of Culture report, 2005).

Internet cafes in China have become a place for social engagement in online communities, especially in the gaming community. Internet cafes and, in turn, the access they provide to virtual worlds, has emerged as a new form of the "third place[12]." The Internet and its virtual worlds are thought to be displacing traditional locations and physical spaces as sites for social interaction. One type of virtual world is the massively multi-player online (MMOs) games that provide users with a virtual space where social interactions can occur much like in real life (Steinkuehler et al., 2006). One reason Internet cafes have come to be seen as a threat is that people flock to these cafes to play games, often staying for long hours or even days at a time. It provides an environment where this type of behavior is accepted, promoted, and even rewarded (ex. through success in game). Take for example, this description of an Internet café:

> The environment at Web bars is troubling. Web bars are narrow, dark, stuffy, and the air in them is foul. Fire-fighting installations in some Web bars are crude and present serious safety hazards. Web bars provide their habitués with a dissolute cultural atmosphere in which they can behave without any inhibitions. A substantial number of the netizens at Web bars are students, but undesirable young people from society also can be found. Some Web bars sell various kinds of cigarettes and cigars, wines, soft drinks, and snacks. Youngsters do as they please here, get in the bad habits of smoking and drinking, and frequently create disturbances. All these things have highly deleterious effects on youngsters' physical and mental health. (Yang, 2006)

Traditionally, Internet cafes in China have been portrayed, in western media, as dark, desolate places where youth go to waste hours on end playing video games. Combining that with recent

[12] Third places that act as social environments for community gatherings, traditionally seen as coffee shops, bars, etc. However, the Internet is increasingly being seen as a "place" that is displacing these physical locations as sites for social gatherings (Oldenburg, 1989).

media coverage of deaths in Internet cafes due to excessive gaming and building safety code violations[13] paints a pretty grim picture of these places as being unsuitable for youth.

Implications for IAD:

Although Internet cafes are a global phenomenon not restricted to China, the culture of these places may have implications within the IAD debate. Unlike in the United States, where Internet usage is mainly a private at-home activity, access to the Internet is provided in highly public places, like these Internet cafes, in China. This societal acceptance of public Internet use suggests that there is a generalized social acceptance of the Internet and its uses. In this way, it could propagate the excessive usage of the Internet and video games in a manner that may appear acceptable, but is in fact problematic. This is seen in the large population of males that hang out at Internet cafes for the sole purpose of playing video games for hours on end.

Conclusions:

The one-child policy, China's censorship abilities, and Internet café culture in Asia, all provide China with a unique perspective in dealing with the Internet addiction debate. The analysis of IAD through a cultural perspective rather than a biomedical perspective provides a more social and political context to the medical views. By studying multiple aspects of this debate, they can be combined to construct a better picture of what may be fueling the reported increased prevalence of this disorder, especially in Asian societies and China, in particular.

[13] In 2002, over a dozen people died in an Internet café fire due to poor facilities

Conclusion:

This thesis has attempted to examine the Internet Addiction Disorder debate through the framework of not only biomedical and scientific data, but also through cultural, social, political, and economic influences that may contribute to the recognition and prevalence of IAD. Internet addiction cannot be discussed only as a biomedical problem, but must be explored through varying lenses. I argue that at least some of the factors and stigma that go into the diagnosis and prevalence of IAD is based not just on scientific observations, but also on cultural perceptions of what is acceptable and "normal" in society. This thesis uses China, the current leader in IAD research, as a case study.

IAD is being studied extensively, even with its lack of recognition in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), because of its increasingly prevalence and usage globally. Concerns about Internet overuse are found in both developing and developed countries and is becoming an increasing cause of concern as the world becomes increasingly dependent on technology. IAD has been consistently studied as similar to substance abuse disorders and impulse control disorders due to their characteristic similarities. It was not until recently that empirical evidence from imaging studies provided evidence for the similarities of IAD with other substance abuse disorders giving credence to the medical theories of IAD. However, IAD's high co-morbidity with a variety of other disorders including, depression and anxiety, and the lack of distinct etiology makes defining causality difficult.

China is able to provide a unique perspective on this debate not only because of the country's concern, but also because of its unique political and social situation. Internet censorship laws in China allow the government to monopolize the dissemination of information in a manner that other countries do not have. This restriction of information may have

implications for how people access the Internet and the computer-human interaction. Similarly, the One-Child policy has produced a generation of only children who are growing up with the Internet as a new social sphere. Lastly, the prevalence of Internet cafes in China and all over Asia provides a "third-place" where social engagement can occur much like the function of coffee shops and bars. The One Child Policy, censorship, and Internet cafes may all contribute to the prevalence of Internet Addiction and its perceived negative consequences.

Analysis of IAD through both a medical and a sociological/anthropological perspective provides a better picture of all the issues encompassing this debate. Clinical data and empirical evidence afford the necessary understanding to pinpoint IAD as a possible mental disorder similar to substance abuse. In contrast, the wider political, social, and economic issues predicated by the Internet's growth in recent decades places a more tangible perspective on the relationship between social change occurring in China and the emergence of the IAD issue. In essence, the combination of the analysis of clinical data on IAD and the sociocultural context of China's changing society will ultimately provide a better and more thorough picture of IAD in the long run. It is likely that IAD will continue to be a growing concern as the Internet penetration rate continues to grow, however its recognition as a mental disorder must first be reconciled with the lack of standardization and diagnostic criteria, as well as better methodological quality studies.

1. Do you feel preoccupied with the Internet (think about previous on-line activity or anticipate next on-line session)?
2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
5. Do you stay on-line longer than originally intended?
6. Have you jeopardized or risked the loss of a significant relationship, job, educational, or career opportunity because of the Internet?
7. Have you lied to family members, a therapist, or others to conceal the extent of involvement with the Internet?
8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?

Figure 1. Sample of Young's diagnostic questionnaire for Internet Addiction

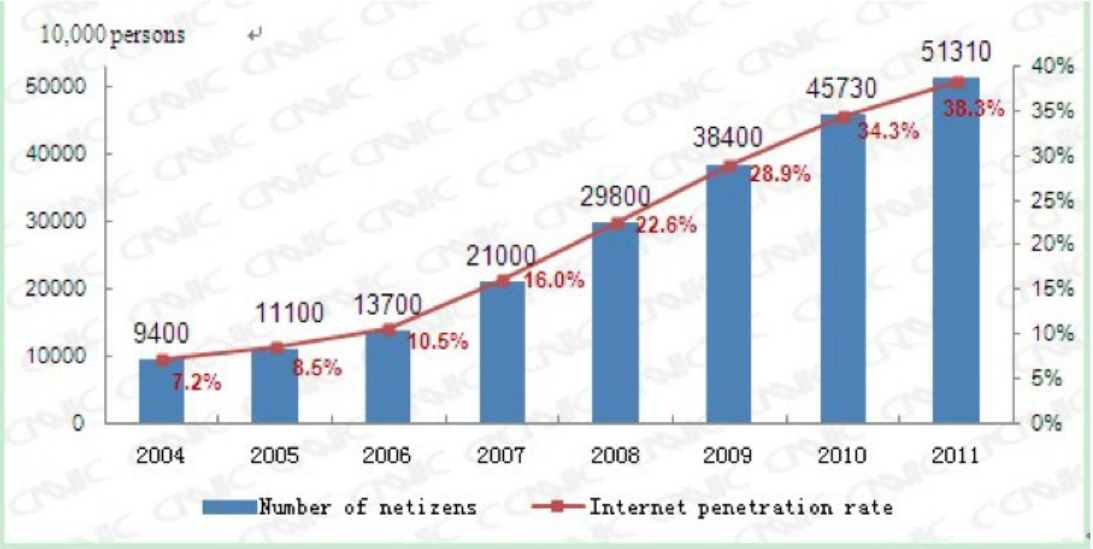


Figure 2. Internet user and Internet penetration in China 2004 – 2011.

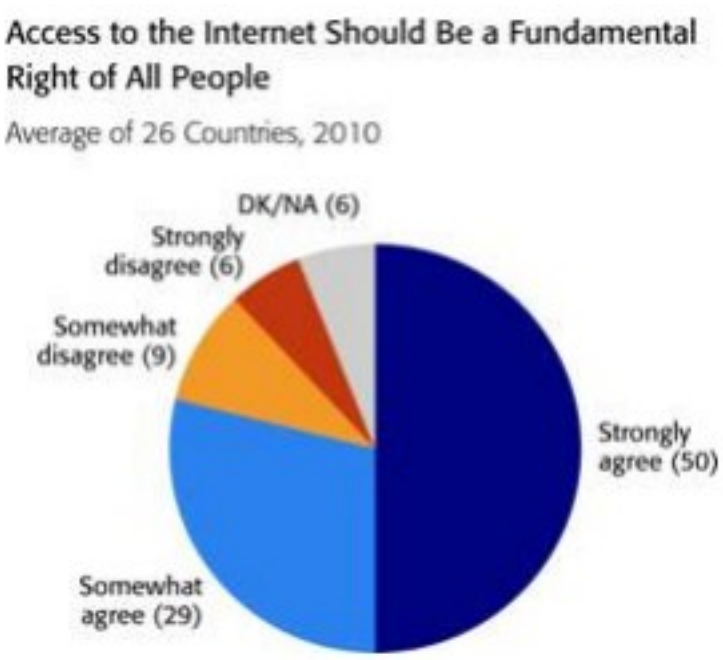


Figure 3. A majority believes that Internet access should be a fundamental right

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