A STUDY ON THE INFLUENCE OF INTERNET ADDICTION ON THE PHYSICAL AND MENTAL EFFECTS OF TAIWANESE ADOLESCENTS

by

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ABSTRACT

While benefiting from highly developed information technology. Internet addiction may be a mental health problem among Taiwanese adolescents and deserves research and professional attention. However, environmental and developmental factors related to adolescent Internet addiction have been less explored. Benefit from highly developed information technology at the same time. Internet addiction may be a mental health problem among Taiwanese adolescents and deserves research and professional attention. However, environmental and developmental factors related to adolescent Internet addiction have been less explored. in particular. Little is known about the relationship between types of stress or urges that may be more relevant to Internet addiction. The relationship between impulsivity and Internet addiction. Furthermore, few studies have attempted to explain the higher prevalence of Internet addiction among boys. therefore. In order to understand the etiology and gender differences of Internet addiction among Taiwanese adolescents.

Therefore, in order to understand the etiology and gender differences of Internet addiction among Taiwanese adolescents, this study attempts to explore Internet addiction, stress and gender differences from the perspective of stress syndrome. relationship between impulses. View. It is hypothesized that high-risk adolescents have higher levels of stress and higher impulsivity than low-risk adolescents. Stress is hypothesized to moderate the relationship between impulsivity and Internet addiction tendencies. The Relationship Between Different Types of Stress and Internet Addiction explores the relationship between different types of stress and Internet addiction. Finally, Gender explores gender differences and discussions of Internet addiction in Internet use, impulsivity, and stress.

Keywords: Internet addiction, Internet use, gender differences, impulsivity

CONTENT

Table number

Chapter One Introduction

1-1 Research Background and Motivation

This study aims to explore the relationship between stress, impulsivity, and gender differences among Taiwanese adolescents. teenager. A recent survey surveyed 12,302 adolescents aged 8 to 24 in 11 countries. A survey of 12,302 adolescents in 11 countries found that Taiwanese adolescents ranked first in many aspects of computer and Internet use Taiwanese adolescents ranked first in many aspects of computer and Internet use (Chiu, 2010). For example, Taiwanese teenagers use more instant messaging (62%) and blogging (54%) than teenagers in other countries. In addition, 90% of users own a home desktop computer, compared to an average of 62% in other Asian countries. The average for other Asian countries is 62%. Although more benefit from the highly developed Taiwan's youth Although teenagers benefit from highly developed information technology, they may also be more prone to Internet addiction problems. The risk of addiction is also greater.

In this study, we employed a stress-integrated model, which we hope will illustrate the theoretical understanding of the nature of Internet addiction in adolescents and the clinical development of adolescent treatment. It first reviews the definition, incidence, and etiology of Internet addiction, and explores the gender of Internet addiction difference. Second, from a developmental perspective, stress is introduced in an attempt to enhance our understanding of adolescent Internet addiction. Finally, impulsivity will be introduced as a condition of current focus, and an attempt will be made to incorporate the perspectives of traditional addiction theory into the study of Internet addiction.

1-2 Internet Addiction and Gender Differences

1-2-1 What is Internet Addiction

When people refer to the word "addiction", its definitions vary. As Freeman (1992) suggested, the concept of addiction is "descriptive" rather than "explainable" in nature. superior Addiction is a state of being "unstoppable" to something. This way differentiates it from a pure hobby or interest. To use the language of the DSM, addiction falls under the category of "substance use disorder," which includes a diagnosis of substance dependence and abuse. The diagnosis consists of a group of cognitive, behavioral, and physiological symptoms Yes, these symptoms are inappropriate for the individual. Criteria for substance dependence require a person to have tolerance and withdrawal symptoms accompanied by a pattern of repeated use regardless of harmful consequences. The term "repeated self-administration of the substance despite significant substance-related problems" ("DSM-IV-TR, 2000, p. 196) specifically states that addiction is not a moral issue but rather a maladaptive state of the individual.

Addiction has traditionally been defined as a problem of dependence on substances. More recently, this concept has been applied to other types of behavioral problems, namely behavioral addictions. Behavioral addiction refers to addictive behaviors that are not mediated by a substance, but exhibit the same repetitive, detrimental way to the individual. Griffith (1998) defined behavioral addiction as having six characteristic properties, namely salience, mood changes, tolerance, withdrawal symptoms, conflict, and relapse. Various behaviors that exhibit the above characteristics are considered behavioral addictions, such as pathological gambling (eg Petry, 2007), compulsive buying (eg Black, 2007) and sex addiction (eg Cooper, Putnam, Planchon, & Boies, 1999). To apply the concept of substance dependence, a person may also have withdrawal, tolerance, and obsessive-compulsive symptoms when the behavior becomes addictive.

The concept of behavioral addiction has also been applied to maladaptive or problematic Internet use. Since Goldberg (1996) coined the term "Internet addiction disorder", this phenomenon has rapidly attracted the attention of psychologists and

psychiatrists. For example, Young (1998) from DSM-IV substances 3 Dependencies were selected out of 8 criteria, and individuals deemed to have 5 or more of the following were flagged as having an Internet addiction. 1) Feeling engrossed in the Internet; 2) Feeling the need to use the Internet for longer and longer to be satisfied; 3) Multiple unsuccessful attempts to control, reduce, or stop using the Internet;
4) Feeling restless, emotional, depressed, or irritable when trying to reduce or stop using the Internet. 5) surfing the Internet longer than originally intended; 6) because the Internet 7) Lying to family members, therapists, or others 7) Lying to family members, therapists, or others to conceal their involvement in the Internet and 8) the use of the Internet as a way to escape problems or relieve painful emotions (KS Young, 1998).

However, Young's criteria have been criticized for being too simplistic in screening, vague terminology, and such criteria can be applied to other types of behavior (Beard & Wolf, 2001). Consequently, various overlapping and different definitions such as "Internet dependence" (Scherer, 1997), "Internet abuse" (Morahan-Martin, 2005), "problematic Internet use" (Shapira et al., 2003)), or "compulsive Internet use" (Greenfield, 1999) has also been used to describe poor Internet use. Although there are several definitions, as reviewed by Weinstein & Lejoyeux (2010), all variants have four components. Excessive use, usually associated with a loss of time; withdrawal, including strong emotional feelings without the Internet; tolerance, including the need for more time of use or better equipment to achieve the same effect; and despite social isolation or fatigue and other adverse consequences, still use.

In Taiwan, Ko, Yen, Chen, Chen, & Yen (2005a) proposed diagnostic criteria for Internet addiction based on clinical interviews and assessment using a clinically validated scale (Chen, Weng, Su, Wu, & Yang, 2003). Ko et al. (2005a) pointed out that while there are many definitions of Internet addiction, most are based on a review of the literature and lack empirical support. Literature review, lack of empirical support. In addition, Liu and Potenza (2007) pointed out that the definition proposed by Ko et al. (2005a) combined the criteria of Shapira et al. (2003) based on impulse control disorder. The criteria of Ko et al. are shown in Table 1-1. It can be found in Table 1-1.

Diagnostic Criteria for Internet Addiction
Adverse patterns of internet use occurring at any time within the same 3-month period, resulting in clinical significant damage or distress.
A. Significant occurrence of 6 (or more) of the following symptoms
1. Focus on Internet Activity **2.** Often unable to resist the urge to use the Internet **3.** Tolerance: Significant increase in Internet use time required for satisfaction **4.** Withdrawal, manifested in any of the following situations. i. Symptoms of depression, anxiety, irritability and boredom after several days without internet activity ii. Using the Internet to relieve or avoid withdrawal symptoms **5.** Using the internet for longer than expected **6.** Persistent desire and/or unsuccessful attempts to cut or reduce Internet usage **7.** Spending too much time on internet activities and leaving the internet **8.** Excessive effort is spent on activities necessary to obtain Internet access **9.** Continuing to use the Internet heavily despite knowing that you have persistent or recurring physical or psychological problems that may have been caused or exacerbated by Internet use
B. Dysfunction: One (or more) of the following symptoms have occurred.
1. Repeated use of the Internet, resulting in failure to perform primary role obligations at school and at home **2.** Damage to social relations **3.** Violation of school rules or laws by using the Internet
C. Internet addictive behavior is not better explained by psychotic disorder or bipolar disorder
be adapted from Ko, C. H., Yen, J. Y., Chen, C. C., Chen, S. H., & Yen, C. F. (2005). Recommended Diagnostic Criteria for Adolescent Internet Addiction Diagnostic Criteria for Adolescent Internet Addiction. The Journal of Nervous and Mental Disease, 193, 728-733.

Table 1-1

1-2-2 Problems with the Definition of Internet Addiction

Some have disputed the validity of the diagnosis, emphasizing the application of the concept of substance dependence to the problem of behavioral addictions in which no substance directly affects neural circuits. Holden (2001) mentioned in his critical essay that one should not treat behavioral addictions as substance addictions until similar neurobiological signs of addiction are found. In response to this argument, several studies have found neurobiological manifestations of substance addiction-like in pathological gambling (eg, Crockford, Goodyear, Edwards, Quickfall, & el-Guebaly, 2005; Potenza, 2003; Regard, Knoch, Gutling, & Landis, 2003), while the neurobiology of IAD is much less studied. However, using fMRI (functional magnetic inference imagery), a study showed that addicted Internet gamers had similar craving responses to nicotine addicts when viewing images of their favorite games (Ko et al., 2009).

However, addiction is a problem that involves not only biological factors, but also its psychosocial aspects. Freeman (1992) noted that "the disease model should be viewed in relation to other emerging descriptive models, not as a model of addiction". There is a bigger problem here. Is IAD itself a problem or is it just a manifestation of other problems? People with IAD who are identified as having IAD generally have higher symptoms of depression and anxiety than those who are not identified as having IAD (eg, Caplan, 2007; Ha et al., 2007; Ko, Yen, Yen, Lin, & Yang, 2007; Young & Rogers, 1998). IAD has also been noted to be associated with attention deficit hyperactivity disorder (Yen, Ko, Yen, Wu, & Yang, 2007; Yoo et al., 2004). In addition, Shapira, Goldsmith, Keck, Khosla, & McElroy (2000) found through diagnostic interviews that all 20 subjects had at least one DSM-IV first axis diagnosis in their lifetime, of whom 70% had an anxiety disorder diagnosis, and 60% had an anxiety disorder diagnosis. % for bipolar disorder. Taken together, the above results suggest that more theory and research are needed to understand the relationship between IAD and other forms of psychopathology. The nature of IAD remains to be clarified, as described by Tartter & Mezzich (1991), "substance abuse may simply be the result of a generalized behavioral disposition". What Makes the Internet Addictive? Before answering this question, one should note that the Internet meets the needs of different users differently. Davids (2001) makes a distinction between specific

and general pathological Internet use. He refers to specific pathological Internet use as manifestations of other pre-existing psychopathologies. For example, pathological gamblers may abuse the Internet to gamble, but they still gamble when they are offline. On the other hand, pathological informants are generally hooked for no particular purpose, but find the Internet helpful for emotional management. As a result, some people may develop bad perceptions that promote Internet overuse, such as "I'm only loved on the Internet". Likewise, Griffiths (1998) points out the difference between being "addicted" to the Internet and being "addicted" to the Internet. The former refers to addiction to the Internet itself, while the latter refers to the specific functions the Internet provides. Therefore, Internet addiction should not be seen as merely an addiction to the Internet. The type of activity on the Internet should also be considered.

In Western countries, the estimated prevalence of IAD ranges from 3.5%-15% (for a review, see Morahan-Martin, 2007), while the estimated prevalence in Taiwanese adolescents ranges from 12%-19.8% (Ko et al., 2005b; Lin & Tsai, 2002). Although these differences may be due to different methods and samples used, Taiwanese adolescents are particularly prone to Internet addiction.

Numerous studies have attempted to investigate the relationship between IAD and Internet usage patterns, such as time spent on the Internet, Internet usage experience, and where Internet users are most often hooked. In a sample of adolescents, previous studies have consistently shown that Internet addiction is significantly associated with more time spent on the Internet (K.-M. Chen, 2004; Tai, 2003; Dong, 2002; Harn, 2000; Yu, 2001).

With regard to Internet use, research findings are quite mixed. Although a small number of studies have shown that less (Young, 1998) or more (P.-L. Chen, 2007; Dong, 2002) experiences of using the Internet are associated with IAD, most studies have not found a relationship between them (S.-H. Chen, 2000; K.-M. Chen, 2004; Hsiao, 1998; Yu, 2001). Therefore, spending more time on the Internet appears to be a more critical variable in predicting Internet addiction than Internet use experience. Regarding where the Internet is used, adolescents use the Internet mainly in the home environment and at school (Harn, 2000; Yu, 2001). However, despite being less popular. Internet use in

Internet cafes is clearly associated with Internet addiction (Harn, 2000; W.-S. Ko, 2003; Yu, 2001), possibly because it provides an environment with no time constraints and quick connections. However, it will be interesting to see whether the prevalence of Internet addiction will decrease or increase as connection speeds increase and the Internet spreads, and whether Internet addicts visit Internet cafes as often as before. Cumulative evidence suggests that Internet addiction, like other traditional addictive disorders and pathological gambling, has stark gender differences. That said, these addictions are more prevalent in men. For example, in a study of the Chen Internet Addiction Scale, S.-H. Chen (2000) found that males had higher rates of Internet addiction than females. Chen (2000) found that the proportion of high-risk college students was twice as high for males as for females. Similarly, using the Young's Internet Addiction Scale, a study of Korean high school students showed that among the high-risk groups for Internet addiction, males accounted for 61.9%, while females accounted for 38.1% (Kim et al., 2006). In addition, using a sample of junior high school students, a prospective study found that at one-year follow-up, the group consistently at high risk for IAD consisted of 81% of boys (Ko, et al., 2007). If there were consistent gender differences, it would be expected that adolescent boys outnumber girls in the high-risk group for Internet addiction in this study.

Internet addiction is a subset of "technology addiction" (Griffiths, 1998). Certain properties of the Internet make it possible to become an addict. However, the view that the Internet is addictive is too "technologically deterministic" (Joinson, 2005). Personality tendencies, coupled with environmental demands (stress) and psychopathology are critical in developing Internet addiction. Internet addiction can be seen as an undesirable consequence of the interaction between humans and machines. We will first discuss the characteristics of the Internet and then discuss personality and Internet addiction research.

1-2-3 Gender Differences in Internet Use

As mentioned earlier, men outnumber women when it comes to the risk of Internet addiction. However, the etiology reviewed above is not sufficient to answer why men are more prevalent with regard to Internet addiction. Why does this gender difference exist? Early literature suggests that the Internet is a male-friendly space, thus making women more vulnerable and reluctant to use the Internet. For example, Wallace (1999) argues that the style and language of the Internet are more masculine. In addition, S.-H. Chen (2000) suggested that men may need more information stimulation from the Internet, while for female addicts, lack of social skills and offline social networks may be the main reasons for online infatuation. However, a recent study found that gender differences in Internet use self-efficacy have diminished (M.-J. Tsai & Tsai, 2010). Still, in their study, boys and girls differed in the purpose of using the Internet. Boys use exploratory functions more often, such as games or search, while girls use more communicative functions, such as instant messaging. Gender differences in IAD may have more to do with preferences for Internet functionality than motivation to use the Internet.

Here, the heterogeneity of Internet addiction mentioned in the previous section may be useful. Regarding the heterogeneity of Internet addiction, the types of Internet addiction are different according to the needs of different users. Men and women may use the Internet differently. For the above purposes, the different types of Internet functions are reviewed below. Boys play more online games than girls. Internet gaming is probably the most prevalent Internet activity associated with Internet addiction (eg, Harn, 2000; van Rooij, Schoenmakers, van de Eijnden, & van de Mheen, 2010). Korean teenagers spend an average of 23 hours a week on the Internet (Kim, 2007, cited in Block, 2008: p.306). Some even use the term "gaming addiction" (Clark & Scott, 2009) to describe the phenomenon. Social bonds and connections in the world of online gaming are strong. Online game players form "tribes" similar to societies or organizations (H.-L. Lin & Cheng, 2004). Thus, the possibility of imagination, immediate reinforcement of gaming experience and social connection together make online gaming potentially addictive. Furthermore, Young (1998) observed that men choose to conduct dominant or controlling activities online, such as online gaming. Therefore, men may be more prone to Internet

addiction because they play more online games.

However, there are now online games specially designed for women, and the function of social interaction is also emphasized. Women are likely to play online games more often than ever. Therefore, we were interested to see if playing online games had different predictions of internet addiction in different genders. Conversely, women prefer to seek intimacy and so use the Internet more often to socialize. Whether social use of the Internet can lead to Internet addiction is an interesting question. In addition to MUD, Young noted that Internet addicts most commonly use interactive features such as chat rooms, newsgroups and email. Orzack (1999) found that older women often prefer to go to sex-related chat rooms. It will be interesting to see if girls' communicative use of the Internet is a greater predictor of Internet addiction.

Internet pornography is often denied and downplayed by informants. The Internet provides a safe, inexpensive and anonymous way to access pornographic information (Cooper, Putnam, Planchon, & Boies, 1999). The convenience of obtaining adult videos and images can be a click on an advertisement provided by the website sponsor. Furthermore, as described by Chen (2003), the intermittent reinforcement provided by the clandestine act of logging onto adult websites may therefore lead to more guilt and excitement in adolescents. It was also important to look at which gender used internet porn more and in which gender internet porn use was more predictive of internet addiction.

1-2-4 Summary

The Internet has certain properties that make it potentially addictive, but informant motivation and pre-existing psychopathology are also key to the development of Internet addiction. However, the Internet provides a variety of gratifications, and users use the Internet for different purposes. Combined with gender differences in Internet addiction, different Internet functional preferences may predict Internet addiction in different genders. Specifically, Internet gaming, communication functions, and Internet pornography were highlighted as their addiction risks when overused. Taken together, the first goal of our study was to clarify and replicate the association between Internet use types and Internet addiction.

1-3 Adolescent Impulsivity and Internet Addiction

1-3-1 Defining and Measuring Impulsivity

Impulsivity is a multi-layered structure with various definitions. Broadly speaking, impulsivity refers to "an action that is poorly conceived, immaturely expressed, too risky, or inappropriate for a situation, and which often leads to suboptimal outcomes" (Evenden, 1999). From a behavioral perspective, impulsivity is considered a difficulty in delaying gratification. Borrowing the old adage "Never put off until tomorrow what you can do," Logue (1995) sees impulsiveness as a difficulty in self-control, that is, "to wait until tomorrow what you want today." In behavioral tasks such as delayed discounting, impulsive individuals choose immediate smaller rewards over delayed larger rewards (Logue, Rodriguez, Pena-Correal, Mauro, 1984). While there have been several proposals for a definition of impulsiveness, the definition suggested by Moeller, Barratt, Dougherty, Schmitz & Swann (2001) is emphasized for its comprehensiveness. Taking into account biological, psychological, and sociological factors, Moeller and colleagues define impulsivity as "the tendency to make rapid, unplanned responses to internal or external stimuli, without regard to the negative consequences of those responses for the impulsive individual or others" " (p. 1784). Such a definition that impulsivity is a trait-like personality structure rather than a single behavior has clear advantages in clinical research. The term "rapid unplanned action" distinguishes impulsive behavior from compulsive behavior involving planning. Second, "disregarding negative consequences" implies that impulsivity is associated with risk, but not necessarily risk seeking.

Impulsivity can be measured by laboratory behavioral tasks (eg Dougherty, Mathias, Marsh, & Jagar, 2005) or neuropsychological tests (eg Chamberlain & Sahakian, 2007), and impulsivity as a trait, like predisposition, It can be measured by self-report questionnaires, which are widely used due to their convenience (Liang, 2005; Moeller et al., 2001). Various self-report questionnaires have been developed to measure impulsivity (Barratt & Patton, 1983; Buss & Plomin, 1975; Dickman, 1993; Eysenck, 1993). In some cases, impulsivity emerges from traditional personality inventories, while in other cases, impulsivity is constructed independently to form a theory of personality. In the former case, Hans Eysenck and S.G. B. Eysenck extracted impulsivity from their theory of personality. Through factor analysis, impulsivity was extracted from psychoticism and extraversion to form a scale. Although two additional

factors have been added to the latest version of scale I7 (Eysenck, 1993), the main components of impulsivity can be broken down into narrowly defined impulsivity and risk-taking. Narrow impulsivity is more associated with psychiatry, while risk-taking is more associated with extroversion. In theory, parochial impulsivity and risk-taking should be unrelated, but this suggestion is not supported by empirical data (Eysenck, Pearson, Easting, & Allsopp, 1985, cited in Liang, 2005, p.6).

In the latter case, Barratt's Impulsivity Scale (BIS; Patton, Stanford, & Barratt, 1995) proved to be one of the most comprehensive measures of impulsivity, combining medical, psychological, behavioral, and social models (cited in Whiteside & Lynam, 2001, p.672). Developed by Ernest Barratt and colleagues, BIS aims at three aspects. 1) describe impulsiveness in normal people, (2) derive the role of impulsiveness in psychopathology, and (3) develop a personality framework in which impulsiveness as a personality trait can be linked to other traits" (Barratt, 1994, p.63). In their original hypothesis, Barratt proposed three aspects of impulsivity: 1) motor impulsivity (action without thinking), 2) cognitive impulsivity (rapid cognitive decisions), and 3) non-motor impulsivity (quick cognitive decisions). Projective impulsivity (present orientation) (Barratt, 1985). However, cognitive impulsivity was less identified in factor analysis, possibly because the cognitive component was harder to measure from self-reports, or as a different dimension of BIS Higher-order constructs (Patton, Stanford, & Barratt, 1995). In their most recent development of the scale, the 11th edition of BIS-11) identified three distinct impulsivity components: attentional impulsivity (the ability to focus on the task at hand) and cognitive instability), motor urges (impulsivity and perseverance), and unplanned urges (self-control and cognitive complexity) (Patton, et al. In conclusion, for comprehensiveness and ease of assessment, this study Impulsivity was defined as the BIS-11 total score.

1-3-2 Impulsivity and Substance Addiction/Pathological Gambling

In theory, impulsivity is linked to addiction. Difficulties with delayed gratification may induce individuals to use substances regardless of the negative consequences it may have. The direction between impulsivity and material dependence may be transactional. It has been noted that impulsive tendencies may play an important role in the early stages of addiction (Kreek, Nielsen, Butelman, & LaForge, 2005), but a reward system sensitized by the addictive substrate may lead to a further decrease in tolerance for delayed rewards (Sinha, 2001). Empirically, substance addiction (Caspi et al., 1997;

Gerald & Higley, 2002; Patkar et al., 2002; Simons, Gaher, Correia, Hansen, & Christopher, 2005) and pathological gambling (Alessi & Petry, 2003; Blaszczynski, Steel, & McConaghy, 1997) were found to be positively associated with impulsivity. Furthermore, emergency management, which provides small immediate rewards for alcohol abstinence, has shown efficacy in short-term treatment of addiction (Potenza, 2007).

Impulsivity can be an important risk marker for addiction, especially during adolescence. In their review of neurodevelopmental changes in adolescence, Chambers and Potenza (2003, p. 76) stated that adolescence is a "substrate that promotes impulses operating more robustly, whereas those that inhibit impulses or are directly involved in decision-making are not yet maximized" ' stage, which means that inhibition is temporarily shut down so that teens can openly experience and learn new things. However, this aspect of brain development also puts teens at risk for addiction. In fact, teenage gamblers show higher impulsivity than others (Vitaro, Arseneault, & Tremblay, 1997). High impulsivity is also associated with difficulties in self-regulation, which includes the ability to flexibly plan and change in response to behavioral consequences (Glantz, 1991). Specifically, the prefrontal cortex, which serves self-regulatory processes, does not functionally mature until mid-late adolescence (Todd et al., 1999; cited in Tarter, 2002, p. 186).

1-3-3 Impulsivity and Internet Addiction

Impulsivity as a complex of inability to control, difficulty delaying gratification, and novelty seeking may be related to Internet addiction as an addictive behavior. However, few studies have investigated the relationship between impulsivity and Internet addiction. For example, one study reported that Chinese IAD college students had higher impulsivity (Cao, Su, Liu, & Gao, 2007). In another study using the paper delay discounting paradigm, Saville, Gisbert, Kopp, and Telesco (2010) showed that compared to controls, internet-addicted college students preferred immediate small rewards rather than delayed large rewards. However, there is a lack of research on Taiwanese adolescents in this area. Therefore, it is critical to explore the association between impulsivity and Internet addiction among Taiwanese adolescents.

1-3-4 Gender differences in impulsivity

Gender differences in impulsivity have been noted, with men generally being more impulsive than women (Labouvie & McGee, 1986; Miller, 1991; Nagoshi, Wilson, & Rodriguez, 1991, Rutledge & Sher, 2001), although some did not this model (eg, Fingold, 1994). Differences between studies may be due to the methods used in assessing impulsivity. In their original study, Patton et al. did not find gender differences in impulsivity measured with the BIS-11 among college students or prison inmates. However, a study using BIS-11 found that male college students were generally more impulsive than females (Stoltenberg, Batien & Birgenheir, 2008). Gender differences in impulsivity are mixed and remain to be explored.

Impulsivity is considered an underlying tendency for antisocial behavior (Moffitt & Caspi, 2001). Whether impulsivity underlies substance abuse, another externalizing disorder, is unclear. In research on pathological gambling, results have been mixed on whether impulsivity is gender-differentiated in the pathological gambling group. For example, using Eysenck's I7, Lightsey and Husley (2002) reported that impulsivity in male college students was more correlated than pathological gambling in female college students. Similarly, Vitaro et al. (1997) reported that male pathological gamblers had higher impulsivity. In Vitaro's study, however, only a male sample was used because pathological gambling is primarily a male-oriented disorder. male-dominated disease. In contrast, Nower, Derenvensky, and Gupta (2004) showed that male and female college students did not differ in I7 scores based on the degree of pathological gambling. Based on the above inconsistencies, it is unclear whether impulsivity and Internet addiction are related differently in each gender. However, because of the significant gender differences in Internet addiction, it is necessary to consider the effect of gender on the association between impulsivity and Internet addiction.

1-3-5 Summary

Impulsivity is a multi-layered structure with many definitions. The current study adopted Barratt's structure because of its comprehensiveness and ease of assessment. Traditionally, impulsivity has been viewed as aphenotype of substance addiction.

Likewise, pathological gambling has been shown to be positively correlated with impulsivity. Internet addiction may have a similar relationship with impulsivity. However, evidence from Taiwanese adolescents is still lacking. Adolescence is a relatively impulsive time in life. Teens with higher impulsivity may be more prone to Internet addiction when they are stressed. Specifically, for impulsive people, stress may intensify their thinking and planning, thus causing them to immediately use the Internet to regulate their emotions despite negative long-term consequences. Therefore, stress may mediate the relationship between impulsivity and Internet addiction.

Finally, since there are clear gender differences in Internet addiction and impulsivity, the relationship between impulsivity and Internet addiction may be expressed differently in different genders.

1-4 Hypotheses of this research

After the above review, we know that certain research has been done on the possible psychopathology of Internet addiction. However, developmental and environmental factors related to puberty, such as life stress, are less considered. Further integration of the stress-integrated model may help to characterize the nature of Internet addiction and its gender differences.

Importantly, addiction can be seen as a consequence of maladaptive coping styles, such as avoiding stressors through substance use. Adolescence is a transitional stage, both psychologically and biologically, that provides not only challenges and opportunities for growth, but also the risk of addiction. Numerous studies have investigated the relationship between adolescent stress and substance addiction; however, few studies have investigated the relationship between adolescent stress and Internet addiction. Furthermore, existing studies on stress and IAD have not compared different types of stress. Viewing Internet addiction as a consequence of avoiding life stress, it is important to find out which stress teens avoid more often. Specifically, this study addresses four types of stress commonly faced by Taiwanese adolescents: academic stress, family and peer relationship stress, romantic relationship stress, and self and future concerns. Because there is no strong theoretical basis to predict, the aim of this study is to explore

their connections in an exploratory rather than confirmatory manner.

The relationship between stress and Internet addiction may differ across genders, as stark gender differences were found during adolescence. Further investigation of the relationship between gender-specific stressor types and Internet addiction may provide us with a hint for understanding gender differences in Internet addiction. Impulsivity, as a trait construct, may play an important role in the development of Internet addiction in adolescents. In this study, we suggest that adolescents screened as high- risk groups for Internet addiction may also exhibit higher impulsivity. In addition, stress may modulate the relationship between impulsivity and Internet addiction. Finally, we will explore gender differences in the relationship between impulsivity and Internet addiction, taking into account gender differences in the prevalence of Internet addiction.

Based on the above research questions, we designed three sets of research hypotheses to test and explore the psychopathology of IAD. Hypotheses 1-1 to 1-3 aim to explore the prevalence of Internet addiction and gender differences in preferences for Internet function among high- risk groups.

- ✓ **Hypothesis 1-1**: There are significant gender differences in Internet addiction: more boys than girls are in high-risk groups.
- ✓ **Hypothesis 1-2**: Internet use experience is not related to Internet addiction. The time spent on the internet per week and the most frequent internet locations were significantly associated with internet addiction. Significantly associated with Internet addiction.
- ✓ **Hypothesis 1-3**: Boys and girls have different Internet functional pattern preferences, and that pattern predicts Internet addiction tendencies differently.
- ✓ **Hypothesis 2-1**: Different types of stress have different associations with Internet addiction tendencies.
- ✓ **Hypothesis 2-1**: Different types of stress correlate differently with Internet addiction tendencies.
- ✓ **Hypothesis 2-2**: High-risk groups of Internet addiction have higher subjective and objective stress than low-risk groups.
- ✓ **Hypotheses 3-1 to 3-3**: aim to explore the relationship between impulsivity and

Internet addiction and the stress regulation hypothesis. Hypothesis 3-1 The high-risk group for Internet addiction has higher impulsivity than the low-risk group. low risk group.

- ✓ **Hypothesis 3-2**: The association tendency between impulsivity and Internet addiction is different in boys and girls.
- ✓ **Hypothesis 3-3**: Stress has a moderating effect on the relationship between impulsivity and Internet addiction.

Chapter 2 Research Methods

This study collected data through a questionnaire survey to clarify the relationship between self-esteem, coping style, Internet rejection self- efficacy and Internet addiction among senior vocational students, and to respond to research questions and research hypotheses. This chapter is divided into four sections, followed by research participants, research tools, research procedures, and data analysis methods.

2-1 Study Participants

The participants were students from 25 classes of seventh and eighth grades in a local junior high school in Taipei County. In total, 862 students completed the survey. Missing data are processed through the following procedures. First, those who did not complete demographic information such as age, gender and grade were excluded. Second, those with no experience with Internet use and who did not respond to weekly Internet use time were also excluded from further analysis. Afterwards, participants who missed more than 10 percent of each of the Internet Use Survey, the Bharat Impulsivity Scale, and the Revised Adolescent Stress Scale were excluded. Finally, participants who did not complete the Chen Internet Addiction Scale were also excluded. The final sample size was 759 (88.05% of the total sample), aged 12-15. The final sample included 387 boys (51%) and 372 girls (49%), as well as 404 (53.2%) seventh graders and 355 (46.8%) eighth graders.

2-2 Research Tools

1-2-1 Personal Data Sheet

In this study, the personal information table includes gender, date of birth, high school occupation and class level, average time spent online in the past year, average time spent online in the past year for non-academic activities, average time spent online in the past year Online time for engaging in various online activities, including online gaming, online shopping or purchasing activities. Online information activity (referring to surfing the Internet or searching for information), Internet pornography (referring to accessing pornographic images, video information, and erotic novels on the Internet, or interacting with pornographic or sexual objects in adult chat rooms and fantasy objects) interaction), and online interpersonal communication (refers to the use of Facebook, Yahoo! The average online time in the past year includes online games, online shopping or purchase activities, online information activities (refers to browsing the web or searching for information), online Sexual activity (referring to obtaining pornographic images, video information and pornographic novels online, or engaging in pornographic or sexual interactions with fantasy objects in adult chat rooms), online interpersonal communication (referring to the use of Facebook, Yahoo! Messenger, ICQ, BBS, Line , WeChat, WhatsApp, Twitter...).

1-2-2 Chen's Internet Addiction Scale

This study used the Chen Internet Addiction Scale (CIAS) developed and modified by Chen Shu-Hui et al. (2003) to measure the level of Internet addiction in the study items. The scale is divided into two main items. "Core Symptoms of Internet Addiction" and "Internet Addiction Related Problems". The core symptoms of Internet addiction include three factors. "Internet Addiction Tolerance" (4 questions), "Compulsive Internet Behavior" (5 questions), and "Internet Addiction Withdrawal Response" (5 questions). Problems related to Internet addiction are divided into two factors. "Interpersonal and Health Issues" (7 questions) and "Time Management Issues" (5 questions). The scale consists of 26 questions, using a four-point Likert-style scale, in which participants rate their compliance with the questions, with 1 being "extremely disobedient" and 4 being

"extremely compliant."

The internal consistency reliability of the full scale was 0.93, and the internal consistency of the five factors ranged from 0.78 to 0.81. The top 5% of the total score on this scale is defined as a "high-risk group" for Internet addiction. They have more functional needs for the Internet and a more positive attitude towards Internet addiction, indicating that students in the high-risk group have different types of differences from the average students (Chen Shu-Hui et al., 2003).

1-2-3 Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale was used to measure participants' self-esteem. The scale consists of 10 questions, with 5 positive questions (eg, overall, I am satisfied with myself) and 5 negative questions (eg, sometimes I think I am useless), the score for the negative questions is the reverse. The scale is a six-point Likert-style scale in which participants were asked to circle the number of items they agreed with in each statement, with 1 being "strongly disagree" and 6 being "strongly agree." In the structural equation model analysis, self-esteem is divided into two factors, positive questions belong to factor 1, and negative questions belong to factor 2; the higher the scale score, the stronger the self-esteem. In addition, the scale has good internal consistency and construct validity (Rosenberg, 1979), and the internal consistency coefficient of the scale in this study was 0.91.

1-2-4 Stress Response Scale

This study used the Stress Coping Scale revised by Zhang Yudai (2003) to measure the stress coping styles of the study participants. Ke Huizhen (1999) first revised the Ways of Coping Checklist (WCC) scale developed by Folkman and Lazarus (1985) with the meaning of Chinese philosophy of life, making the scale suitable for use by local research participants. Zhang Yudai (2003) further revised the revised scale of Ke Huizhen (1999) according to the concepts of Folkman and Lazarus (1985) and Holahan, Moos and Schaefer (1996), and divided it into three types of coping: cognition-problem Cognitive/problem-focused coping, Avoidance/emotion-focused coping, and seeking social support coping, all with good internal consistency Reliability (between .87 and

.92).

Since the Stress Coping Scale revised by Zhang Yu-Dai (2003) is aimed at six kinds of stressful situations for adults, the study participants were asked to evaluate their possible ways of reacting. Therefore, Lin Min Pei (2014) specially focused on four common stressful situations for high school vocational students. To make adjustments, including "when academic performance is frustrated (such as performance is not as good as others, or teachers are not satisfied with their performance)", "when oneself is criticized or misunderstood", "when facing upcoming challenges or threats" When you are stressed (such as facing a big exam or about to undergo surgery, etc.)", and "when you are emotionally frustrated (such as not being liked or your friends are cold or unloved, or your boyfriend/girlfriend has a new crush)", etc.; - 24 items in four situations of "problem-oriented coping", 24 items in four situations of "escape-emotion- oriented coping", and 12 items in four situations of "seeking social support- oriented coping"; in addition, the scale adopts Likert-type four-point scale. For each declarative sentence, the research participants must circle the number that matches their own situation or situation on the four-point scale, and the response method is "never" 1 point, "almost so" 4 points; three The higher the score of each subscale, the more often the individual adopts this type of stress coping when faced with different stress situations.

1-2-5 Internet Rejection Self-Efficacy Scale

The Internet Rejection Self-Efficacy Scale was compiled by Lin et al. (2013), with a total of 19 items and three subscales, namely "Game use" (9 items), "Acquire information" (6 questions), and "Nothing to do" (4 questions). This scale uses the Likert-style six-point scale to answer, that is, for each declarative sentence, the research participants must circle the number that corresponds to their degree of certainty on the six-point scale. Completely confident, and 2, 3, 4, and 5 points are 20%, 40%,60%, and 80% confident, respectively. The total score of the 19 items of the full scale represents the individual's confidence that he or she can stop or refuse to use the Internet under high-risk situations. higher degree.

In this study, the internal consistency coefficient of the Internet rejection self-

efficacy scale was .91, and the internal consistency coefficients of the three subscales were: .94 for the "playing games" subscale; .94 for the "getting information" subscale .90; "Nothing to do" subscale is .93; the above coefficients show that the reliability of the Internet Rejection Self-Efficacy Scale and its three subscales is good.

2-3 Research Procedures

The research team obtained the consent of high school principals, counselors, and tutors before conducting the questionnaire, and obtained the consent of the test head teacher before conducting the questionnaire. Participants were then asked to fill out a questionnaire numbered "Understanding High School Students' Stress and Emotion Regulation and "Changes in Internet Use Behavior" with a consent form on the first page to ensure informed consent. The confidentiality of personal information is clearly stated, and relevant doubts are explained, so that the research subjects can understand and answer the questionnaire with more confidence.

2-4 Research Tools

2-4-1 Descriptive Statistics

Descriptive statistics were used to understand the basic demographics of study participants, average weekly time spent online, average weekly time away from school, average weekly smartphone Internet time, and time spent on various types of online activities.

2-4-2 Pearson correlation analysis

Pearson correlation analysis was used to examine the correlation between self-esteem, coping style, Internet denial self-efficacy, and Internet addiction to test Hypothesis 1: "Both self-esteem and Internet denial self-efficacy are negatively associated with Internet addiction." Correlation, the 'cognitive-problem-solving oriented coping style' in coping style was also negatively related to Internet addiction, while the 'avoidance-emotional oriented coping style' was positively related to Internet addiction. Coping styles were also negatively associated with Internet addiction, while avoidance-emotion-oriented coping styles were positively associated with Internet addiction.

2-4-3 Structural Equation Mode

This study used structural equation modeling to test Hypothesis 2 (both self-esteem and Internet rejection self-efficacy significantly and negatively predict Internet addiction, and cognitive-problem-solving oriented responses in response types significantly and negatively predict Internet addiction, and the avoidance-emotion-oriented response can significantly and positively predict Internet addiction). Hypothesis 3 (adolescents' internet denial self-efficacy plays a modest role in predicting the relationship between self-esteem and internet addiction), Hypothesis 4 (adolescents' internet denial self-efficacy in predicting self-esteem and internet addiction) play a moderate role in the relationship between them). "Hypothesis 3 (adolescents' internet denial self-efficacy mediates the relationship between self-esteem and internet addiction) and Hypothesis 4 (adolescents' internet denial self-efficacy mediates the relationship between coping style and internet addiction The estimating method was used to estimate the effect coefficients and fitness in each model. To account for the representativeness of the sample, functions that estimated the mean and intercept were used to deal with missing values.

Furthermore, for the intermediate model analysis of Hypotheses 3 and 4, the criteria of Baron and Kenny (1986) were used. The criteria include:

(1) the relationship between the argument and the dependent variable is significant; (2) the relationship between the intermediary variable and the dependent variable is significant; (3) the relationship between the argument and the intermediary variable is significant; (4) the relationship between the argument and the factor is significant. Significant relationships between variables are attenuated (partial mediation) or insignificant (complete mediation) due to the addition of mediating variables. (4) The significant relationship between the argument and the dependent variable will be weakened (partial mediation) or even insignificant (complete mediation) by adding mediator variables. In addition, this study also adopted Bootstrapping's Bias-corrected (BC) method (Shrout & Bolger, 2002) to test whether the mediating effect of the dependent variable's self-efficacy and rejection network is effective.

2-5 Operation Definition of Variables

Age refers to the age of the participants at the time of the study, in years. Grade refers to the grade of the participant at the time of the study. Gender refers to participants' responses to a question with two categories (boys, girls). Internet use experience refers to participants' responses to questions ranging from "no Internet use experience" to "more than 10 years". The most common place to go online was the participant's response to a question, with 4 categories (home, school, internet cafe, other). Weekly Internet use time was operationalized as participants' responses to a question, including nine categories ranging from "less than 2 hours" to "more than 35 hours." Internet functional preference was manipulated as the participant's total score for a specific Internet functionalities in an Internet usage survey. For example, preference for online gaming was calculated by participants' ratings of "frequency" and "importance" of online gaming items. Internet addiction tendencies were operationalized as participants' scores on the CIAS. High-risk groups for Internet addiction were participants who scored 64 or higher on the CIAS. The low-risk group for Internet addiction refers to participants who scored 63 points or less on the CIAS.

Subjective academic stress refers to participants' scores on the subjective academic subscale of the Adolescent Stress Scale-Revised. Objective academic stress refers to participants' scores on the objective academic subscale of the Adolescent Stress Scale-Revised. Subjective/objective family and peer relationship stress, romantic relationship stress, and ego and future worry stress operate using the same definitions.

2-6 Procedures and Informed Consent Agreement

This study was approved by the Institutional Review Board (IRB) of the Department of Psychology, National Taiwan University. After an email communication, the school principal and the director of the counseling center formally agreed to support this study. Researchers, research consultants, counseling center directors, and school teachers meet together to report on the purpose and details of the research. Considering the pressure of high school entrance exams, school leaders agreed that we would invite 25 classes in grades 7 and 8 instead of grade 9 for this study. The researchers also agreed to report Internet addiction screening results to schools for feedback and prevention. School officials agreed to use one class (45 minutes) per class to conduct the survey without affecting student schedules. Participants were invited to fill out a volume of

questionnaires administered by a school counselor with experience in questionnaires.

In terms of informed consent, we obtained dual consent from students and parents. Before the survey, parents of students received a passive informed consent form one week before the screening day. Among other things, if they disagree with their child's participation, they can return the refusal form so their child won't be investigated. On the other hand, those who did not were deemed to have passively agreed to participate in the research. Second, an active informed consent form was also obtained from the students after detailed instructions from the teachers. Students participate in research voluntarily. All participants filled out the questionnaire anonymously. Each participant received a small gift after completing the questionnaire.

Chapter 3 Results and Discussion

3-1 Internet Use and Internet Addiction

Table 3-1 shows the mean, range, and standard deviation of CIAS and Internet functional preferences. It can be seen that the junior high school students in the current sample have the ability to use various Internet functions, but the functions such as BBS, Internet gambling, and Internet pornography are used less.

Variable	N	Minimum	Maximum	Average	Standard deviation
Internet Addiction Chart	759	26	96	48.76	15
Internet overtime	759	14	56	27.92	9.39
Obsessive-compulsive symptoms	759	5	20	9.37	3.5
Withdrawal symptoms	759	5	20	10.4	3.91
Tolerance symptoms	759	4	16	8.14	2.9
Internet Addiction Related Issues	759	12	43	20.84	6.54
Relationship and Health Issues	759	7	27	12.5	4.28
Internet Feature Preferences	759	5	20	8.34	2.91
Game	754	0	8	3.59	2.54
Pure message	758	0	8	4.48	2.64
To chat with	757	0	8	0.99	1.73
E-mail	755	0	8	2.57	1.99
Electronic bulletin board	750	0	8	0.95	1.86
message search	757	0	8	3.47	2.04
Shopping	755	0	8	1.52	2.06
Gamble	754	0	8	0.21	0.84
sex	754	0	8	0.88	1.78
download	750	0	8	4.55	2.19
multimedia	755	0	8	5.13	2.21
personal website	757	0	8	3.83	3.06
Feel free to browse	755	0	8	3.02	2.42
Operation	757	0	8	3.93	2.23

Table 3-1 Descriptive statistics of CIAS and Internet functional preferences

Chi-square analysis was performed for Hypotheses 1-1 (Clear gender differences in Internet addiction: more boys than girls in the high-risk group). Using the cut-off point of 63/64, 128 participants (16.9%) were identified as a high-risk group for Internet addiction. There were no differences between the high- and low-risk groups in age ($t = .68$, $p = 0.498$) or grade ($\chi2 = 0.31$, $P = 0.577$). The gender difference was significant ($\chi2= 17.77$, $P < .001$), with more boys than girls in the high-risk group. The estimated Internet penetration rates for boys and girls are 11.5% and 5.4%, respectively, with a sex ratio of about 2:1 (see Table 3-2). Therefore, hypothesis 1-1 is confirmed.

Hypotheses 1-2 (internet use experience was not associated with internet addiction, whereas weekly internet use and most frequent internet locations were significantly associated with internet addiction) were tested by a set of chi-square analyses. Internet use experience was recoded into 3 groups because there were fewer than 5 observations with less than 2 years of Internet use experience in the high-risk group, violating the assumptions of using a chi-square analysis. The results (see Table 3-3) showed that the high-risk group spent more time on the Internet per week ($\chi2=76.08$, $P<0.001$). Second, in terms of places to go online, high-risk groups for Internet addiction were more often at Internet cafes than low-risk groups and Internet cafes used the Internet more often than low-risk groups ($\chi2 = 29.97$, $P < .001$). Interestingly, Internet use experience was significantly associated with Internet addiction, more in the high-risk group in the 5-9 year group ($\chi2 = 7.20$, $P < .05$). However, this trend declined when the age exceeded 10 years. All that said, assuming 1-2 is partially supported.

		low risk	high risk	sum	Pearson's chi-square test
		N(%)	N(%)	N(%)	
grade	7^{th} Grade	333(43.9)	71(9.4)	404(53.2)	X2=0.31
	8^{th} Grade	298(39.3)	57(7.5)	355(46.8)	
	male	300(39.5)	87(11.5)	387(51.0)	X2=17.7***
gender	Female	331(43.6)	41(5.4)	372(49.0)	

Table 3-2. Demographics of low-risk and high-risk groups

Variable		low risk	high risk	sum	Pearson's chi-square test
		N(%)	N(%)	N(%)	
Weekly internet usage time	<2Hour	179(23.6)	8(1.1)	187(24.6)	χ2=76.08***
	2-4Hour	178(23.5)	21(2.8)	199(26.2)	
	5-9Hour	91(12.0)	25(3.3)	116(15.3)	
	10-14Hour	48(6.3)	8(1.1)	56(7.4)	
	15-19Hour	38(5.0)	20(2.6)	58(7.6)	
	20-24Hour	42(5.5)	12(1.6)	54(7.1)	
	25-29Hour	19(2.5)	9(1.2)	28(3.7)	
	30-34Hour	11(1.4)	12(1.6)	23(3.0)	
	>35Hour	25(3.3)	13(1.7)	38(5.0)	
Internet use experience	>5 year	242(31.9)	35(4.6)	277(36.5)	χ2=7.20*
	5-9 year	337(44.4)	76(10.0)	413(54.4)	
	<10 year	52(6.9)	17(2.2)	69(9.1)	
Online location	Family	574(28.1)	105(14.3)	679(92.4)	χ2=29.97***
	School	25(3.4)	4(0.5)	29(3.9)	
	Internet Cafe	12(1.6)	15(2.0)	27(3.7)	

Table 3-3. Internet usage statistics for low-risk and high-risk groups (N= 759)

For Hypotheses 1-3 (boys and girls have different patterns of Internet functional preference that predict Internet addiction tendencies differently), hierarchical regression analyses were performed separately for boys and girls. The dependent variable was the CIAS score. First, age and grade were entered into the regression equation as covariates. Next, enter your Internet experience, where you go online most, and how much time you spend on the Internet per week. Finally, different kinds of Internet functional preferences were entered to test which preference was the most predictive of that gender. A summary of the hierarchical regression analysis can be found in Table 3-4. As a result, Internet gaming ($\beta = .32$, $p < .001$) significantly predicted Internet addiction tendencies in boys. In addition, Internet pornography and downloading files from the Internet were also weakly linked to Internet addiction. However, instant messaging did not predict Internet addiction tendencies in boys ($\beta = .05$, $p = .405$). Interestingly, the pattern is reversed for girls. While instant messaging was the most predictive ($\beta = .25$, $p < .001$), the explanatory power of online gaming was weak ($\beta = .12$, $p < .05$). In addition, various Internet preferences, such as online gambling, listening to music or watching videos, and loitering online for no specific purpose, were also weakly associated with Internet addiction tendencies. From the above results, hypotheses 1-3 are supported.

Male (N = 340)							
					Adjusted	R2	
Group	variable	β	t	R2	R2	change	F
1	age	-0.03	-0.54	0.001	-0.005	0.001	0.1
	grade	0.01	0.19				
2	Experience	0	-0.06	0.241	0.229	0.240 ***	21.19***
	Place	0.13	2.59*				
	time	0.17	3.18**				
3	game	0.32	5.81***	0.402	0.366	161 ***	11.32***
	sex	0.13	2.58*				
	download	0.11	1.99*				
	Newsletter	0.05	0.83				
女 (N= 344)							
					Adjusted	R2	
Group	variable	β	t	R2	R2	change	F
1	age	0.03	0.63	0.007	0.001	0.007	1.22
	grade	-0.04	-0.75				
2	Experience	0.01	0.17	0.188	0.176	.181 ***	15.68***
	Place	-0.03	-0.81				
	time	0.08	1.71†				
3	Newsletter	0.25	4.16***	0.48	0.45	.292***	15.75***
	Hobby	0.18	3.40**				
	media	0.16	3.10**				
	game	0.12	2.76**				
	gamble	0.1	2.27**				

Table 3-4. Summary of Hierarchical Regression Analysis of Internet Use to Predict Internet Addiction

3-2 Main Analysis

The mean, standard deviation, range, and scale mean of different types of subjective/objective stress are shown in Tables 3-5. The most common subjective/objective stress experienced by teens was academic stress, while romantic relationship stress was the least common in the current sample.

Variable	N	Minimum	Max	Average	Standard deviation	Proportional average
S_Aca	748	0	36	19.17	8.52	2.13
S_Rel	738	0	28	10.32	6.39	1.47
S_Rom	752	0	20	3.45	4.33	0.69
S_Self	748	0	20	7.42	5.07	1.48
O_Aca	755	0	9	7.95	1.44	0.88
O_Rel	756	0	7	4.78	1.57	0.68
O_Rom	754	0	5	1.55	1.49	0.31
O_Self	757	0	5	3.17	1.56	0.63

S_Aca=Subjective academic stress.
S_Rel=Subjective family and peer relationship pressure.
S_Rom=Subjective relationship stress.
S_Self=Secondary pressure for self and future concerns force.
O_Aca=Objective academic pressure.
O_Rel=Objective family and peer relationship pressure.
O_Rom=Objective relationship pressure.
O_Self=Objective pressure for self and future concerns.

Table 3-5 Descriptive Statistics of Subjective and Objective Stress

For Hypothesis 2-1 (different kinds of stress have different correlations with Internet addiction tendencies), the Pearson zero-product correlations between different kinds of stress and Internet addiction tendencies were calculated, as shown in Table 3-6 shown. The results in Tables 3-6 show that different types of stress generally have weak tomoderate positive correlations with Internet addiction tendencies (Pearson r from 0.097 to 0.355). In boys, subjective pressure on self and worry about the future had the strongest relationship with Internet addiction tendency. However, in terms of objective stress, relationship stress had the strongest relationship with Internet addiction tendency. In contrast, girls' subjective and objective relationship stress had the strongest relationship with Internet addiction. Surprisingly, both subjective/objective academic stress and

Internet addiction had a weak positive relationship in both sexes, but the relationship was stronger in girls. This result shows that the hypothesis 2- 1 is supported.

A series of two-way analysis of variance (ANOVA) was used to explore hypotheses 2-2 (high-risk group for Internet addiction had higher subjective and objective stress than low-risk group) and 2-3 (high-risk group and low-risk group Group differences in subjective and objective stress were different in boys and girls). Using each stress as a dependent variable, the group factors (low-risk group and high-risk group of Internet addiction), gender (boys and girls), and group x gender interaction factors were tested. The mean and standard deviation of each unit and the results of variance analysis are shown in Table 3-7. The results of the analysis showed that the group main effects were all significant, indicating that the high-risk group had higher levels of four subjective stress than the low-risk group. In addition, the main effect of gender was also significant. In addition to relationship stress, girls have higher subjective stress than boys. Interestingly, for subjective relationship stress, the interaction term was significant ($F=6.48$, $P<0.05$), indicating that the difference in relationship stress between the high-risk group and the low-risk group was greater for girls than for boys.

	CIAS	S_Aca	S_Rel	S_Rom	S_Self	O_Aca	O_Rel	O_Rom	O_Self
CIAS	-	.191***	.265***	.355***	.198***	.205***	.143**	.330***	.147**
S_Aca	.115*	-	.402***	.168** .	509***	.516***	.140**	0.097	.334**
S_Rel	.257***	.587***		.353***	.502***	.224***	.648***	.322***	.381***
S_Rom	.233***	.323***	.414***		.307***	.117*	.206***	.855***	.180***
S_Self	.290***	.526***	.677***	496***	-	.224***	.278***	.247***	.746***
O_Aca	0.026	.609***	.341***	.190***	.358***	-	.294***	.127*	.252***
O_Rel	.159**	.382***	.688***	.296***	.477***	.460***	-	.271***	.354***
O_Rom	.209***	.194***	.260***	.864***	.358***	.193***	.284***	-	.208***
O_Self	.194***	.344***	.469***	.331***	.789***	.434***	.542***	.310***	-

CIAS=Chen Internet Addiction Scale.
S_Aca=Subjective Academic Stress.
S_Rel=Subjective family and peer relationship pressure.
S_Rom = subjective romantic relationship pressure.
S_Self=Secondary pressure for self and future concerns.
O_Aca=Objective academic pressure.
O_Rel=Objective family and peer relationship pressure.
O_Rom=Objective relationship pressure.
O_Self=Objective pressure for self and future concerns.

Table 3-6. Pearson zero-sequence correlation between subjective/objective stress and CIAS score

		Male		Female	
Independent variable	Group				
		Mean	*SD*	Mean	*SD*
Academic pressure	Low risk	17.45	8.33	19.78	8.02
	High risk	20.27	9.76	24.43	8.08
Family peer pressure	Low risk	8.85	6.21	10.59	6.03
	High risk	12.12	6.96	15.13	6.07
Male and female stress	Low risk	3.17	4.07	2.72	3.64
	High risk	5.45	5.4	7.17	5.51
Self-future stress	Low risk	5.98	4.98	8.05	4.68
	High risk	8.94	5.81	9.73	4.57

Table 3-7. Descriptive Statistics of Subjective and Objective Stress

3-3 Internet Use and Internet Addiction

Gender differences in prevalence, ie more at-risk boys than girls, were supported in this study, supporting Hypothesis 1-1. Such results suggest that gender differences in IAD are fairly common. Furthermore, different activities predicted Internet addiction differently for each gender, supporting Hypotheses 1-3. Boys' use of Internet gaming, Internet pornography, and file downloads was a stronger predictor of Internet addiction. Internet porn use was particularly predictive of Internet addiction in boys. This phenomenon may be consistent with Cooper et al.'s (1999) view of online sexual attraction. For adolescent boys with high sexual arousal, the Internet may be particularly attractive due to the free, accessible and anonymous nature of Internet pornography.

For girls, their use of instant messaging was more predictive of internet addiction. Internet gaming also has a predictive effect on Internet addiction, but the effect is milder. Hanging out on the Internet was a particular predictor of Internet addiction only for girls. The effect suggests that widespread pathological Internet use may be special for girls. Suppose 1-2 is partially supported. In this study, more time spent using the Internet was associated with Internet addiction in adolescents. This is consistent with other studies on Internet addiction (S.-H. Chen, 2000; K-M Chen, 2004; Harn, 2000; Yu, 2001). On the other hand, those who use the internet mainly in internet cafes are more prone to internet addiction, albeit in small numbers. The results showed that internet cafe use remained a consistent predictor of internet addiction. However, experience with Internet use is also associated with Internet addiction, a finding that is inconsistent withprevious studies (S.-H. Chen, 2000; K.-M. Chen, 2004; Chou & Hsiao, 2000; Harn , 2000). In our findings,

5-9 years of Internet experience was more associated with Internet addiction, but less than 5 years or more than 10 years was less associated with Internet addiction. This trend is consistent with some previous studies. In Young's (1998) original study, 83% of Internet addicts had been online for less than a year, suggesting that Internet users may initially become addicted, but with increasing user experience, the adverse effects of overuse may diminish. make most people curb its use. This result is also similar to Kraut's findings (Kraut et al., 1998; Kraut et al., 2002) that negative effects of the Internet, such as depression or anxiety, disappeared during the 3-year follow-up, which may suggest that with Individuals with longer Internet experience may become more aware of the problem of overuse and then pay more attention to their Internet use. Excessive use of the Internet can be distressing in itself, and individuals can become frustrated by the conflict between Internet use and being close to others. Such feedback may prompt individuals to monitor their Internet usage.

3-4 Gender Differences in Internet Addiction

3-4-1 Types of Gender Stress and Internet

Addiction Regardless of the type of stress, the high-risk group exhibited higher levels of stress subjectively and objectively than the low- risk group, supporting Hypothesis 2-2. In terms of different types of stress, the stress of ego and future concerns was more associated with internet addiction in boys, and the relationship stress was more associated with internet addiction in girls. Combined with the results of Internet functional preference mentioned above, boys and girls may have different patterns of Internet addiction.

In boys, for those who fail to live up to their own expectations and feel uncertain about the future, through role-playing, the play process can bridge the gap between the actual self and the imagined self. Fisher & Griffith (1995) pointed out that complete eye-hand coordination and attention are required to complete game tasks. It is possible that, although different types of games have been developed, boys are more likely than girls due to better eye-hand coordination (cited in Shaffer, 2005: p.230) and more opportunities for recognition through gaming skills Addiction through the use of online games, especially for those who have higher stress on self and future. On the other hand, relationship stress was more correlated with girls' tendency to Internet addiction. This means that seeking romantic relationships that cannot be fulfilled in real life may play a

role in girls' internet addiction. This may apply to adolescent girls who are frustrated in real-life social relationships and interactions. Girls' identity formation process is related to attachment (Besser & Blatt, 2007). In this context, young girls are encouraged to "become more engaged and competent in forming intimate relationships" (Steinberg, 1996, p.321; cited in Besser & Blatt, 2007). The concept of gender reinforcement assumes that gender differences amplified by pressure to conform to gender roles increase when a person reaches puberty (Shaffer, 2005: p. 239). Correspondingly, girls are expected to display more feminine traits, such as caring for others, during adolescence. Thus, frustration in relationships may affect girls more than boys. For example, research by Groer et al. (1992) showed that girls are more stressed than boys when it comes to interpersonal relationships (cited in Boekaerts, 1997: p.469). The warmth and companionship provided by online interactions may tempt adolescent girls to indulge in online interactions or affairs. At the same time, gaming among adolescent girls may also be associated with social interactions and romantic relationships. Such results raise the question that Internet addiction in girls may be a disguised form of seeking comfort and companionship online. However, adolescent girls may also be at risk of being seduced by friends they meet online. It is estimated that from 2000 to 2005, there were 105 cases of teenagers being seduced by netizens, 89% of which were girls. In addition, this trend has been increasing, for example, from 2006 to 2007, the number of cases of sexual assault by netizens increased by 30%, of which more than 70% were teenagers under the age of 18 (Hsieh, 2008). These may be due in part to the anonymous nature of the Internet, which may blur the lines of relationships.

3-4-2 The interactive effect of stress and gender on CIAS

In the current study, girls are generally more stressed than boys. Especially in terms of objective academic stress and subjective/objective relationship stress, and the difference between the high-risk group and the low-risk group is larger for girls than for boys. Such results seem to contradict the facts and cannot explain why the prevalence of Internet addiction among boys is higher than that of girls. However, previous studies have shown that although girls are generally more stressed than boys (Jose & Ratcliffe, 2004; Rudolph, 2002), they are at higher risk for depression than for substance abuse (Achenbach, 1991; Nolen-Hoeksema & Hilt, 2006). Adolescent girls use more social support-seeking strategies to cope, while boys use more physical entertainment strategies (Frydenberg, 1997). In order to achieve male roles, adolescent boys are more encouraged to be independent and independent of others; conversely, girls are more receptive to being dependent on others.

Conversely, girls are more receptive to being dependent and supporting others (Besser and Blatt, 2007). If Internet use can be seen as an avoidant or avoidant coping with stress, then it is possible that, despite greater stress, girls may seek social and emotional support to cope, so their Internet Use is not harmful unless they use the Internet as their only source of social support. However, for boys, although experiencing fewer adverse events, playing games may be used as a primary means of coping with stress, thus potentially weakening their other coping resources and causing them to rely more on internet gaming. Such preferences may put them at a higher risk of Internet addiction. Additionally, if adolescent boys seek support from others, contradicting their male gender identity, online anonymity may give them a place to openly reveal their feelings to others. Second, although the effect was small, it showed that girls with more objective academic stress were more likely to develop Internet addiction. This result may be due to gender stereotypes, and girls may have more constraints on achievement expectations than boys. For boys who are academically stressed, other types of achievement, such as sports, may help ease the expectations of others. For girls who base their self-worth solely on academic performance, when they are frustrated with their grades, they may engage in more online activities because other real-life achievements are trivial to them of. It should

be emphasized that boys and girls may not be entirely different in terms of Internet use and stress response patterns. Instead, the above narrative is about each gender's possible predisposition to Internet addiction and its relationship to Internet use and stress. Furthermore, the above discussion is not sufficient to explain the uniqueness and necessity of the Internet for those who are addicted to the Internet. For example, if girls' use of social interaction devices is more predictive of internet addiction and more associated with relationship stress, then online interaction may constitute more attraction. A challenging question, then, is why offline interactions are not enough for them. Compensation for offline situations is one, but not all, cause of internet addiction. The above argument should be seen as a suggestion to study gender differences in Internet addiction, not as a key cause of Internet addiction.

Taken together, the possible claims covered in the preceding paragraphs suggest that more variables should be considered when studying gender differences in Internet addiction, including coping strategies, levels of social support, and measures of emotional distress such as anxiety or depression.

3-5 Impulsivity and Internet Addiction

Internet addiction was associated with higher impulsivity regardless of gender. This result suggests that impulsivity is an important aspect of Internet addiction. The absence of sex differences suggests that some other important variable may underlie sex differences in IAD. However, it is also possible that the effect of gender differs on measures of impulsivity. Laboratory measures of impulsivity have been shown to differ from self-report inventories, as self-report measures have little to do with behavioral task measures (Reynolds, Ortengren, Richards, & de Wit, 2006). The relationship between gender and addictive behavior may vary by measurement method. For example, when impulsivity was measured by a stop-signal task (a behavioral task that measures the response-inhibiting component of impulsivity), gender moderated the link between impulsivity and problem drinking; however, when impulsivity was measured by BIS, gender did not (but partially mediated) the link between them (Stoltenberg et al., 2008). It is suggested that in future studies, measures of impulsivity may help define gender differences in Internet

addiction. One might ask whether sensation seeking, a construct somewhat similar to impulsivity, is associated with Internet addiction. Sensation seeking is defined as the search for a variety of different, novel, complex, and intense sensations and experiences, and a willingness to take physical, social, legal, and financial risks for such experiences" (Zuckerman, 1994, p.27). Drugs Use, often seen as a sensation-seeking activity, is empirically related to sensation- seeking measures (eg, Lejoyeux, Feuché, Loi, Solomon, & Adès, 1998). In the case of Internet addiction, however, impulsivity may be a more relevant construct than sensation seeking for two reasons. There is a lack of consistent evidence that behavioral addictions, such as pathological gambling, are associated with sensation seeking. Research by Castellani and Rugle (1995) showed that gamblers scored significantly higher than alcoholics on measures of impulsivity, but not feeling seeking. Second, Internet addiction may be an activity that is less associated with strong feelings. In the Internet addiction literature, research on sensation seeking is more popular than impulsivity, but the results have been mixed. Using the Zuckerman's Sensation Seeking Scale, Lavin and colleagues (1999) initially hypothesized that Internet addicts had higher sensory seeking, but paradoxically found that Internet addicts had lower sensory seeking among US college students. In explaining their findings, Lavin et al suggest that the sensory seeking of Internet-dependent individuals may not be physical, but rather mental or virtual. Conversely, Lin & Tsai (2002) showed that among Internet-addicted high school students in Taiwan, they scored higher on the overall sensory seeking and inhibition subscales.

Higher scores on the Inhibition subscale. Lin & Tsai concluded that this difference may be due to age or cultural issues, or due to the heterogeneity of Internet addiction (ie, different Internet content may have different levels of stimulation). More recently, Velezmoro et al. (2010) showed that sensation seeking as a unifying construct was not associated with Internet abuse. However, the inhibition subscale appeared to be more predictive of Internet addiction. Similar to Lavin et al., Velezmoro et al. state that "sense seeking as a whole does not appear to be associated with Internet abuse, as those with high overall scores for feeling seeking mayseek out more engaging activities (p. 1529).)". A key question, however, is which component of impulsivity is more predictive of Internet addiction. Using hierarchical multiple regression, it appeared that lack of self-

control (ie, motor urges) was more associated with Internet addiction in both sexes, while lack of planning (ie, unplanned urges) also predicted Internet addiction in boys only. Intuitively, problems with response inhibition are similar to difficulty stopping rewarding behaviors such as gaming and clicking on websites. The ability to exercise impulsivity or inhibitory responses may be important in predicting IAD because Internet use is primarily an exercise planning activity in nature.

3-6 Why does not support pressure mode

The current findings do not support the hypothesis that stress modulates the relationship between impulsivity and Internet addiction. Regarding pathological gambling, Lightsey and Husley (2002) found that stress was predictive of pathological gambling in low-impulsive men; however, this trend was absent in the high-impulsivity group. In their study, however, stress had no predictive effect on pathological gambling. This means that there may be a more complex relationship between stress and Internet addiction. Other approximate measures may be more important for the current study. For example, coping styles may play a role in buffering or enhancing Internet usage behavior.

3-7 The meaning of curvilinearity

Between subjective academic stress and Internet addiction, only boys were found to have a U-shaped curve relationship, but girls did not. This may imply that Internet addiction in boys may be related to high or low subjective academic stress. Flow theory suggests that boredom occurs when skills outweigh challenges; conversely, anxiety occurs when challenges are too great for skills to withstand (Csikszentmihalyi, 1991, 2000). Wills and Shiffman (1985) also noted that people may use substances to enhance their effects if the environment does not elicit enough bodily sensations. If stress can be viewed as a demand-resource imbalance, the left side of the curve can represent those who are bored with academic work. Therefore, the main reason for this group's fascination with the Internet may be the lack of sufficient stimulation from real life. Future research should take into account that the tendency to boredom is an important factor in the development of Internet addiction, especially in boys. Conversely, the right side of the curve suggests

that adolescent boys may become hooked on the Internet to escape when real-life academic stress is overwhelming. It should be noted, however, that for those at-risk boys who reported little academic stress, while boredom and physiologically low arousal might motivate them to use the Internet, they were not necessarily academically superior enough to overcome the challenge. Instead, they were more likely to deny the pressure, or even give up, not caring about academic performance. On the other hand, the challenges provided by online games may give them more fun than academic tasks and, therefore, a higher risk of addiction. Given the above findings, different Internet activities should also clarify their emotion-regulating functions (ie, enhancing positive emotions or reducing negative emotions). Subtypes of Internet addiction like those found in pathological gambling may exist depending on different motivational and etiological factors (Blaszcnyski & Nower, 2002). For example, according to the driving force of gambling. McCormick (1987) distinguishes between recurrent depression and chronic low-stimulation types of gamblers. Frequently depressed gamblers gamble to escape painful feelings, while chronically understimulated gamblers gamble to reduce their excessive boredom. Therefore, the primary therapeutic target for each subtype should be different. Likewise, Stewart, Zack, Collins, and Klein (2008) identified enhanced gamblers, coping gamblers, and low emotion regulation gamblers based on their primary motivation to gamble. Enhanced gamblers gamble purely to increase positive emotions, while coping gamblers also pursue positive emotions from gambling, but their gambling is more driven by relieving negative emotions. In the end, regulating emotions is not the main reason for low emotional regulation gamblers. In conclusion, the inconsistent relationship between stress and Internet addiction tendencies may suggest that underlying emotional disturbances should be more important than Internet addiction itself.

3-8 Clinical Significance

Our study is the first empirical study of Internet addiction in Taiwan that incorporates Internet use, stress, and impulsivity from a developmental perspective. At the same time, gender patterns of Internet addiction are replicated and explored. The study is exploratory and the results are preliminary, so further empirical research is needed.

Our study has some important implications for the clinical practice of Internet addiction. First, when assessing adolescent Internet addiction, it should be noted that different types of stress are associated with Internet addiction differently in each gender. For boys who are self- stressed or worried about the future, screening for internet addiction should be done, especially those who rely on playing online games as their main recreational activity. For girls, on the other hand, relationship stress can be a significant marker of Internet addiction, especially for those who use the interactive features of the Internet frequently and intensively and have less offline social life. The relationship between impulsivity and Internet addiction suggests that behavioral approaches targeting response inhibition and delayed gratification may help prevent and treat IAD. For example, encouraging regular intervals may help develop self-control and prevent overuse of the Internet. For those who are already addicted to the Internet, once the relationship between the therapist and client is good enough, a supervision contract can be signed to take breaks at each fixed interval as a way of compensating for Internet use, and Efficacy of training response inhibition. For those who prefer immediate smaller reinforcements rather than delayed larger rewards, a variety of alternative activities can be introduced to expand the entertainment options.

Finally, the inconsistent relationship between stress and Internet addiction tendencies may suggest that underlying emotional disturbances and motivation to use the Internet may be more important than Internet addiction itself. In order to understand the use status of Internet addiction, Internet emotion regulation measures should be designed.

3-9 Limitations and Future Directions

Our study has several limitations. First, we did not use emotion measures to control for other types of psychopathology. Second, coping measures should also be included in order to study the interaction of stress and coping measures and how different types of coping strategies buffer or enhance the risk of Internet addiction. Third, other types of impulsivity measures, such as behavioral tasks including time perception and delay discounting, should be investigated to gain a more comprehensive understanding of the relationship between impulsivity and Internet addiction.

Finally, the inferences of our study should be limited because our sample is not representative of all Taiwanese adolescents. Samples from other schools and different regions in Taiwan should be included to infer the generalizability of our findings.

Chapter 4 Conclusion

Taken together, the above findings still do not explain why adolescent boys have a higher risk of Internet addiction than girls. However, the current study provides a new understanding of gendered patterns of Internet addiction. As can be seen from the discussion above, boys and girls may have different developmental pathways for Internet addiction. Therefore, more research should be conducted on gender differences in Internet addiction.

Whether subjectively or objectively, higher stress is related to Internet addiction. Impulsivity was significantly associated with Internet addiction, especially motor impulsivity was more correlated with Internet addiction than others. However, stress did not moderate the link between impulsivity and Internet addiction. Our study has certain limitations, but also contributes to future research on Internet addiction. It is suggested that different types of stress should be screened for different genders when evaluating Internet addiction, and that treatments targeting response inhibition may help prevent and treat Internet addiction. Future research should consider emotion regulation mechanisms of the Internet in nature to further understand the relationship between stress and Internet addiction.

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